

Systematic Review

The role of cognitive and personality factors in youth deliberate self-harm: a systematic review

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ABSTRACT

This systematic review aims to investigate the relationship between cognitive factors, emotional tendencies, and personality traits contributing to deliberate self-harm (DSH) behaviour among youth. This systematic review followed the preferred reporting items for systematic reviews and meta-analyses guidelines. Literature searches were conducted in March 2024 using Scopus, PubMed, and Google Scholar, focusing on "deliberate self-harm," "youth," "cognitive factors," and "personality profiles." The search was limited to articles in English from medicine, psychology, and social sciences, published in the U. S., Canada, Australia, the U. K., and New Zealand. Articles were selected based on their relevance to youth DSH and related cognitive constructs, excluding those focused on suicidal ideation. A narrative synthesis was performed, and study quality was assessed using the Cochrane risk of bias tool. A total of 21 articles were identified and included in the final review. Emotional regulation emerges as crucial in preventing DSHing behaviours, with early detection facilitated by screening for impulsivity, sensation-seeking, and emotional dysregulation. Prevention strategies targeting specific cognitive patterns and personality traits associated with self-harm are informed by insights from this review, drawing from diverse studies. Limited yet promising evidence underscores the need for further research to elucidate these relationships. Additionally, significant correlations between specific online behaviors and DSH among youth are noted. Understanding these cognitive constructs and personality traits can offer timely support and guidance in clinical practice, potentially leading to more effective, personalized interventions for reducing DSH behaviour among youth. Prospero registration no.: crd42024525239.

Keywords: DSH, Youth, Cognitive factors, Personality profiles

INTRODUCTION

Personality is akin to a constellation formed by the interplay of attributes such as thoughts, emotions, behaviours, and self-relationships, creating a unique pattern that shapes how individuals perceive the world and

interact with others.¹ It is important to understand the personalities of young when looking at DSH behaviours because it involves a complex interaction. Research highlights that certain cognitive constructs and emotional tendencies contribute to DSHing behaviours, where deficits in problem-solving skills and emotion regulation

can lead to feelings of helplessness and emotional dysregulation, increasing vulnerability to engage in the DSH.²

DSH is closely linked to intense affective states, encompassing emotions ranging from sadness and anger to profound emptiness and even ecstatic jubilation.^{3,4} Both anthropological and clinical interpretations have associated DSHing behaviours with spiritual and sexual motivations.^{3,5} This made it possible for researchers to merge historical observations with modern scientific methodologies to explore the risk factors and functions of DSH.

The pattern of DSH behaviour evolved into DSH syndrome, later known as non-suicidal self-injury (NSSI), conceptualised as a coping mechanism for emotion regulation and distress communication.^{6,7} DSH, encompassing acts like non-fatal self-poisoning and self-inflicted injury is frequently underestimated in prevalence.

Cognitive constructs play a pivotal role in understanding the mechanisms behind DSH behaviours in youth. Cognitive-behavioural therapy (CBT) targets cognitive distortions, emotion regulation, and problem-solving, fostering adaptive thought patterns and responses.⁸

Personality factor play a significant role in understanding the cognitive constructs and emotional tendencies associated with DSH behaviours in youth. Specific personality traits such as neuroticism, impulsivity, sensation seeking and borderline personality traits that correlate with an increased susceptibility to engage in DSH. For instance, youth with high sensation-seeking tendencies may be drawn to DSH due to the sensation of pain, offering a way to experience heightened emotions or even a sense of relief.⁹⁻¹³

The rationale for this systematic review arises out of the need to address significant public health issue of DSH among youth. Examining the relationship between cognitive constructs, emotional tendencies, and personality traits in the manifestation of DSH behaviors among youth, drawing from established theories such as Beck's cognitive-behavioural theory and the five factor model of personality, we aim to provide a theoretical framework for understanding the psychological underpinnings of DSH among youth.

This systematic review aims to comprehensively identify and synthesises the various cognitive constructs and personality traits associated with DSH behaviours in youth, exploring the relationships and correlations between these factors and DSH behaviours.

METHODS

Selection criteria

The preferred reporting items for systematic reviews and

meta-analysis (PRISMA) recommendations were used as guidelines to report the review.¹⁴ The review was conducted at the psychiatry department of a tertiary health care hospital in eastern Bhubaneswar, India.

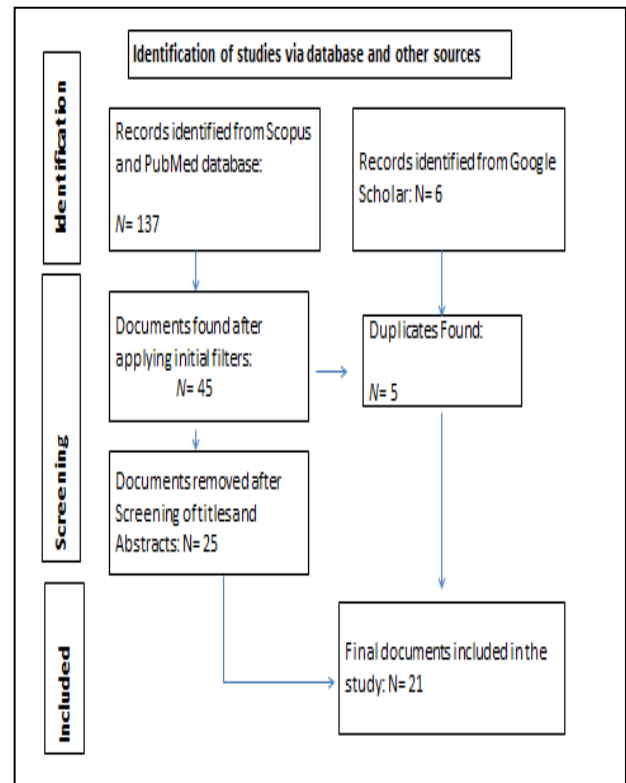


Figure 1: PRISMA flowchart of study selection process.

Systematic search

The literature search was conducted from the 15th of March, 2024 to 30th April, 2024. We conducted the search using Scopus, PubMed and Google Scholar Advanced Search databases. The search in the Scopus database was done under the "search within" heading of articles titles, abstract and keywords. The keywords that were employed and the Boolean operators used were as follows: "deliberate self-harm", AND Youth, OR "cognitive factors", OR "personality profiles". This initial search yielded 122 documents. This number found were methodologically diminished into a sizeable number that can be worked with, with more ease. This we did by limiting the subject area to medicine, psychology and social sciences. Final publication of articles and reviews in the following countries were taken into account: United States of America, Canada, Australia, United Kingdom and New Zealand. Figure 2 shows a graph of the countries and the number of documents therein included. The source type was journal, and only open source with only those published in English language. In the final analysis after applying all these measures, the final documents arrived at were 30 and exported to excel file. A search from the PubMed database resulted in an initial-results of 15

documents and merged with those in the excel file from Scopus for duplicates to be removed. Five duplicates were found and removed. Additional six documents were outsourced from Google Scholar and added. The entire documents included in the study are shown in Table 2.

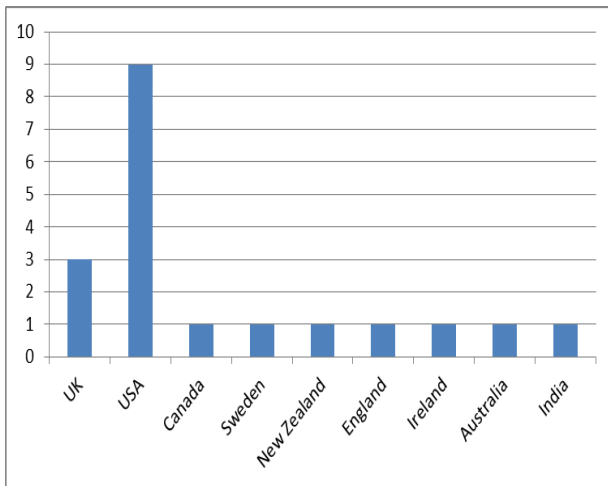


Figure 2: Country wise comparisons of the extracted records included in the study.

Screening and data extraction

The titles and abstracts of the documents were screened to ensure that only relevant articles are used for the review. Articles that had suicidal inclinations in their titles were removed to ensure that the review centers on only DSH with non-suicidal thoughts. To this end, 25 articles were found to be unfit and subsequently removed. Two of the reviewers independently carried out the data screening and extraction. In instances where discrepancies arose regarding which documents to exclude, a consensus is reached by both authors through a discussion. A summary of the inclusion and exclusion criteria are clearly stipulated under their respective headings below.

The inclusion criteria for the review include the following: Youths or adolescents, DSH behaviours, studies that bordered on assessing cognitive constructs and personality traits related to DSH behaviours. Studies conducted in specific countries: United States of America, Canada, Australia, United Kingdom and New Zealand, articles published in English journals and articles published in English Language.

Exclusion criteria

Articles with suicidal ideations in the titles were expunged to focus specifically on DSH without suicidal thoughts. Studies conducted outside the named countries in the inclusion criteria were excluded. If publication was not published in a journal, it was excluded. Articles that were published in other languages other than English language were also excluded.

Outcomes and data collection approach

Our aim in this review is to investigate the following outcomes related to DSH behaviours among youth: Incidence and prevalence of DSH, factors associated with DSH, effectiveness of interventions in reducing DSH.

Data collection involved seeking all results related to each outcome domain from each study included in the review. No specific criteria were applied to select certain data points over others; instead, a comprehensive approach was taken to ensure the inclusion of all relevant information.

Grouping of studies for synthesis

In our review, we organized the studies we collected to make them easier to analyze. We looked at things like how the studies were set up, what they studied, and what they found. This helped us see if there were any similarities or differences between them. We grouped them based on their design, who they studied, what they did, and what the findings were. This way, we were able to carefully study the research and spot any important trends or differences. While we didn't change the data to make it easier to compare or analyze, we did check each study's quality using Cochrane risk of bias assessment tool. However, we didn't reach out to the authors for any missing details, so there might be gaps in our information. So, it's essential to exercise caution when interpreting our findings, knowing that some information might be missing. Due to several reasons such as variation in terms of study design, transparency and clarity, outcome measures, and limited available data, we resorted to narrative analysis for this review.

Study characteristics and intervention

The majority of the studies focused on adolescents and youth, while a few encompassed prenatal stages and adults, as demonstrated in the works of.^{15,16} These studies extended their examination to include children aged 5 and above, such as the remaining studies were centered on adolescents and youth.^{17,18}

One study employed antidepressant therapy in combination with selective serotonin reuptake inhibitors (SSRIs) at the modal dose or higher than modal dose.¹⁹ In their study, utilized emotional regulation as the intervention measure.^{20,21} Three studies implemented dialectical behavior therapy (DBT) as interventions. Among these employed DBT and integrated family therapy, whereas solely utilized DBT for adolescents.²¹⁻²³ In the study conducted by, a randomized controlled trial (RCT) design was employed with two treatment groups: Treatment as usual (TAU) plus problem solving training (PST), and TAU alone. However, interventions were not explicitly reported in the remaining studies.²⁴

Study design

Reference employed a longitudinal, population-based, prospective study design.²⁵ The findings from this study revealed a reduction in eating disorders behaviour at different frequency, however, adolescents with other specified feeding or eating disorder (OSFED)-other 1 OSFED-other 2 were associated with depression, anxiety disorders and DSH.¹⁹ Also utilized a propensity-matched cohort study approach as their study design, while reference conducted an online study and this study revealed internet access, parental abuse, involvement in fights, and depressive symptoms were significant predictors of DSH among adolescents.²⁶ This author employed a 3-site, single-masked, randomized superiority trial design.²⁷ In their study also, conducted a national representative cross-sectional survey.¹³ These researchers, employed focus groups and interviews as their study design.²⁸ Conversely, the remaining papers did not involve the execution of original research; rather, they synthesized and analyzed existing research studies. As a result, these papers were not able to report on specific study designs.

Variability and sources of heterogeneity

This review takes a look at DSH behaviors among youth, exploring various different reasons that make it varied and complicated. It identifies cognitive constructs, such as problem-solving skills and emotion regulation challenges, and personality factors, including traits from the five factor model, as significant contributors to heterogeneity. Affective states, historical and cultural influences, psychological underpinnings like family dynamics, negative self-views, and impulsivity, along with online behaviors, further contribute to the variability observed in self-harm patterns among youth. The impact of intervention approaches and methodological differences across studies in shaping the heterogeneous nature of findings is duly acknowledged.

The review sheds light on the significance of addressing sources of heterogeneity, emphasizing the variability in cognitive, personality, affective, cultural, and familial dimensions of DSH among youth. It highlights how differences in negative self-perceptions, impulsivity levels, online engagement, and responses to interventions contribute to the observed heterogeneity. Understanding how history, culture, and our minds affect things, the paper sees the importance of specific and personalized solutions. Also, it notices that studies may differ in how they're done, stressing the need to think about the methods and tools used. This review supports a complete and detailed understanding of DSH, recognizing the various factors that make it complex and different among young people.

Assumptions about missing or unclear information

We made the following assumptions in situations where information was missing or unclear in the included studies:

Missing participant characteristics: If participant characteristics were not clearly reported, it was assumed that the study authors adequately described the study population.

Intervention details: If specific details about interventions were lacking, assumptions were made based on the available information provided in the study.

Funding sources: If funding information was not disclosed, it was assumed that the study authors had no conflicts of interest to report.

Effect measures used in the synthesis

For each outcome in our review, we followed the PRISMA guidelines to specify how we measured the effects. We didn't do detailed statistical analyses, but we organised the different ways researchers measured things in the studies we looked at. They used different methods depending on what they were studying, like comparing risks, averages, or odds. Our goal was to make it clear how researchers figured out their results and presented them.

RESULTS

Results from the screening of data

For each of the screening processes, the number of articles is presented in Figure 1. A total of 21 full articles were identified and included in the final review.

Associations, interventions and predictors of DSH behaviours

Associations with mental health conditions: Several studies underscore the significant associations between DSH behaviours and prevalent mental health conditions, including depression, anxiety disorders, and drug use among adolescents.

Antidepressant therapy and DSH: A notable discovery from the research landscape reveals that children and young adults initiating high-dose antidepressant therapy face an alarming twofold increase in the risk of engaging in self-harm, raising concerns about the potential impact of treatment dosages on such behaviours.

Emotional regulation and DSH: Certain studies have shown that when people have a hard time controlling their emotions, it can affect how they deal with stress. This suggests that focusing on ways to manage emotions could be important when trying to prevent DSH.

Effectiveness of interventions: Encouragingly, targeted interventions such as DBT and emotion regulation therapy demonstrate their potential in reducing self-harm behaviours among youth, offering promising avenues for preventive strategies.

Risk factors and predictors: Exploring the predictors of DSH behaviours, studies identify key factors including depressive symptoms, parental abuse, internet access, and involvement in fights, facilitating a more nuanced understanding of vulnerability factors.

Coping mechanisms and coping strategies: Adolescents' engagement in DSH is often linked to their use of such behaviours as coping mechanisms to manage distress and negative emotions, shedding light on the intricate relationship between self-harm and emotional regulation.

Table 1: Quality assessment.

Authors and years	Selection bias	Random sequence generation	Allocation concealment	Reporting bias	Other bias	Performance bias	Detection bias	Data collection methods	Attrition bias
Aggarwal et al (2017)	Low	NA	NA	Low	Low	NA	NA	Low	NA
Biernesser et al (2020)	Low	NA	NA	Low	Low	Low	NA	Low	NA
Bjureberg (2023)	Low	Low	Low	Low	Low	Low	Low	Low	Low
Chu et al (2018)	Low	NA	NA	Low	Low	NA	NA	NA	NA
Evans et al (2005)	High	NA	NA	Low	Low	NA	NA	Low	High
Freeman et al (2015)	Low	NA	NA	Low	Low	Low	Low	Low	NA
Glenn et al (2019)	Low	NA	NA	Low	Low	Low	Low	Low	NA
James et al (2015)	High	NA	NA	Low	Low	Low	NA	Low	Low
Llamocca et al (2022)	Low	NA	NA	Low	Low	Low	Low	Low	High
Lo et al (2020)	Low	NA	NA	Low	Low	Low	Low	Low	High
Lowenstein (2005)	High	NA	NA	Low	Low	NA	NA	High	NA
McAuliffe et al (2014)	Low	Low	Low	Low	Low	Low	Low	Low	Low
Micali et al (2015)	Low	NA	NA	Low	Low	Low	Low	Low	Low
Mille et al (2014)	Low	NA	NA	Low	Low	NA	NA	Low	High
Mitchell et al (2007)	Low	NA	NA	Low	Low	NA	NA	Low	NA
Robillar et al (2021)	Low	NA	NA	Low	Low	NA	NA	Low	NA
Boxer (2010)	Low	NA	NA	Low	Low	NA	NA	Low	NA
Scourfield et al (2011)	Low	NA	NA	Low	Low	NA	NA	Low	NA
Sinha et al (2021)	Low	NA	NA	Low	Low	NA	NA	Low	NA
Victor et al (2015)	Low	NA	NA	Low	Low	NA	NA	Low	NA
Yao (2023)	Low	NA	NA	Low	Low	NA	NA	Low	NA

Quality assessment

To determine the reliability and credibility of the individual documents, a quality assessment was done by two of the authors who have had several years of experience in the field of psychiatry. One of them did the initial assessment and the other crosschecked. The quality rating was premised on the following criteria: “Selection bias”, “random sequence generation”, “allocation concealment”, “reporting bias”, “other bias”,

“performance bias”, “detection bias”, “data collection methods” and “attrition bias”. Each of the articles included for the study was assessed by biases using “the Cochrane collaboration risk of bias tool.”²⁸ Table 1 shows the quality assessment carried out for the included studies (Table 1).

DISCUSSION

Investigating cognitive constructs and personality profiles associated with DSH behaviours can lead to an all-

inclusive approach to mental health care that goes beyond symptom management. For instance, the identification of specific cognitive patterns, such as impulsivity and emotional regulation difficulties, can aid in the early detection of at-risk individuals, allowing for timely intervention before self-harming behaviours escalate.^{29,30} Personality traits that contribute to DSH, such as sensation-seeking tendencies or a need for social validation, mental health professionals if considered, can tailor interventions to address not only the behaviour itself but also the underlying psychological motivations.²⁷ This research bridges the gap between theoretical frameworks and practical applications, enabling mental health practitioners to provide personalized and targeted interventions that address the diverse cognitive and emotional factors contributing to self-harm among youth.

An inherent limitation of the present systematic review is the scarcity of articles that explicitly delve into the examination of cognitive constructs and personality factors in relation to DSH behaviours among the youth. Out of the 21 articles initially identified for inclusion in this review, it is crucial to clarify that only a subset directly addressed these areas. Specifically, only a total of four articles were found to focus on cognitive constructs and personality factors, with three concentrating on cognitive constructs and one exploring personality factors. This limited number of studies dedicated to these dimensions raises important considerations for both interpretation and future research directions.

Despite the restricted number of articles, the findings from these studies provide preliminary insights into the potential relationships between cognitive constructs, personality traits, and DSH behaviours. The presence of even a small number of articles underscores the significance of investigating these dimensions within the context of DSH behaviours. Though the evidence available is limited, these findings serve as the base for understanding the relationship between these psychological factors and self-harming behaviours in youths.

Given the paucity of research in this area, caution must be exercised when interpreting and generalising findings. The limited representation of cognitive constructs and personality traits in the available literature may not provide a comprehensive picture of the multifaceted nature of DSH behaviours. Additionally, the specific nuances and variations within these dimensions might not be fully captured by the current body of literature.

Moving forward, it is evident that there is a compelling need for more extensive research efforts aimed at exploring the roles of cognitive constructs and personality traits in DSH behaviours among youth. The current findings, albeit limited, underscore the potential importance of these dimensions in understanding risk factors, etiological pathways, and potential intervention strategies. Future studies should aim to bridge this gap by

employing robust methodologies and comprehensive assessments to showcase the relationships between cognitive constructs, personality traits, and DSH behaviors.

These researchers have demonstrated the importance of emotional regulation in averting DSHing behaviours.^{26,27} In the summary of findings section of the former, two specific items of emotional regulation difficulties namely Nonacceptance of emotional regulation and limited access to emotional regulation strategies fully mediated the association between COVID-19 related stresses and DSH behaviours. This suggests that these difficulties in effectively managing and regulating emotions played a crucial role in explaining the link between stresses and DSH behaviours among participants. Results from the latter also threw more light on the importance of emotional regulation as the result suggested that internet delivered emotion regulation therapy delivered adjunctive to TAU was found to be superior to TAU only in reducing clinician rated non-suicidal self-injury. 'Individuals who engage in DSH have strong experiential avoidance repertoires or response tendencies, possibly stemming from a deficit in emotional regulation skills, coping strategies when emotionally aroused.'¹⁶ Theoretically, clinical and empirical work alike indicate that self-harm behaviours primarily constitutes an emotional regulation strategy.^{26,22}

Understanding youth's cognitive constructs and personality profiles related to DSH behaviour is vital for effective interventions. Emotional regulation's crucial role has been highlighted by Robillard's mediation between stressors and self-harm via emotional regulation emphasises addressing challenges to prevent self-harm.^{26,27} Bjureberg's internet therapy success underscores enhancing emotional regulation to curb self-harm. This aligns with Linehan's theory and necessitates interventions equipping youth with emotional regulation strategies, unveiling the link between cognition, personality, and self-harm.¹⁸

The summary findings of as indicated in Table 2, were that "Burns challenges" propagated by social media platforms like YouTube, Twitter, and Facebook constitute a current youth culture phenomenon. Then again, findings of indicated that youth reporting DSH were significantly more likely than their peers to possess a sexual screen name, engage in discussions about sex with individuals known only online, and utilise chat rooms.²⁰ Additionally, they were more inclined to have close relationships with individuals they met online. Notably, three-quarters of the youth who reported self-harm also used instant messaging. These study's findings indicate a significant correlation between specific online behaviours and DSH among youth. The engagement in risky online activities such as having a sexual screen name, discussing sexual topics with online acquaintances, and utilizing chat rooms is suggestive of potential underlying cognitive constructs and personality traits.^{21,24}

Table 2: Studies from final selection included in the systematic review.

Authors, year, country	Study design	Sample characteristics	Assessment tool (s)	Summary of findings
Micali et al (2015), UK	Longitudinal, population-based, prospective	Children and youth sample size-14721, age: 1 to 16+ years	Questionnaire, BMI, youth risk behaviour surveillance system questionnaire, McKnight risk factor survey, development and wellbeing assessment, DSM-5 criteria	Although engaging in eating disorders behaviours at different frequency cut offs, adolescents with OSFED-other1 and 2 associated similarly with depression, anxiety disorders, drug use, and DSH.
Miller et al (2014), USA	Propensity score-matched cohort study	Age: 10-64 years, sample size-162,625	NA	The rate of DSH was approximately twice as high among children and young adults (ages 24 and younger) who initiated high-dose antidepressant therapy compared to those who initiated modal-dose therapy. The hazard ratio for DSH among children and young adults initiating high-dose therapy was 2.2 (95%CI, 1.6-3.0), indicating a significantly increased risk.
Chu et al (2018), NA	Literature review	Age-10-20 years	NA	"Burns challenges" propagated by social media platforms like YouTube, Twitter, and Facebook are a current youth culture phenomenon.
Victor et al (2015)	Not indicated	Sample size-1502 Age-11-25 years	The behavior and symptom identification scale 24, the Alexian brothers urges to self-injure scale, the inventory of statements about self-injury-short form, the Alexian brothers assessment of self-injury, DSM-5	Low severity methods of NSSI were found to be more strongly associated with SI compared to high severity methods. SI was associated with intrapersonal (automatic) NSSI functions. Some indices of NSSI severity, such as the number of methods and urge for NSSI, were associated with SI, while others, such as age of onset, were not.
Lo et al (2020), USA	Not indicated	Age-5-17 years	NA	The overall number of visits to paediatric emergency departments has remained stable. However, there have been significant increases in specific types of visits. Visits for DSH increased by 329%, while visits for all mental health disorders rose by 60%. Substance use disorder visits for children increased by 159%, but alcohol-related disorder visits fell by 39%. Notably, rise in mental health disorder visits was observed in EDs of all paediatric volumes, regardless of children's ED classification. Furthermore, visits to low-paediatric-volume and non-metropolitan areas increased by 53% and 41%, respectively. Most of increased visits for mental health disorders occurred at non-children's EDs in both metropolitan and nonurban settings, which are shown to be less prepared to provide higher-level paediatric emergency care.
Llamocca et al (2022), USA	Retrospective cohort study	Youth with new bipolar disorder episode between 2010 and 2017 N-25,244 Age-5-19 years	Ohio Medicaid claims and death certificate data	During the follow-up period, 6.0% of youth with bipolar disorder had at least one DSH event. Factors associated with increased DSH risk among youth with bipolar disorder included older index age, female sex, comorbid psychiatric/medical conditions, prior DSH/suicidal ideation, and prior emergency room mental healthcare. Prior DSH was most strongly associated with increased DSH risk for 3 months after a new bipolar disorder episode. Being non-Hispanic black (vs. White, non-Hispanic) and prior psychiatric hospitalization were associated with decreased DSH hazard. DSH risk was highest for 3 months after a new bipolar disorder episode. Suicide, unintentional injury, and all-cause mortality rates were elevated in youth with bipolar disorder.

Continued.

Authors, year, country	Study design	Sample characteristics	Assessment tool (s)	Summary of findings
James et al (2015), USA	Pre-post study	Two groups of adolescents who engaged in DSH N-55, N-45 Age: 12-18 years	Youth outcome questionnaire (YOQ)	DBT was found to be effective in improving clinical functioning for youth with DSH
Robillard et al (2021), Canada	Online survey	Youth N-809 Female-56% Male-44% White-74% Aged-12-18 years	Not indicated	There was a significant association between COVID-19-related stress and recent DSH among Canadian adolescents. The study revealed that two specific aspects of emotion regulation difficulties, namely "nonacceptance of emotional responses" and "limited access to emotional regulation strategies," fully mediated the association between COVID-19-related stress and DSH. This suggests that these difficulties in effectively managing and regulating emotions played a crucial role in explaining the link between stress and DSH among the participants.
Bjureberg et al (2023), Sweden	A 3-site, single-masked, randomized superiority trial	Youth, N-166 adolescents Females-92.8%, Males-7.2%, Aged-13 and 17 years	Youth version of DSH Inventory	The internet-delivered emotion regulation therapy delivered adjunctive to TAU was found to be superior to TAU only in reducing clinician-rated NSSI. The intervention resulted in significant reductions in self-injury compared to the control condition
Yao et al (2022), New Zealand	Nationally representative cross-sectional survey	Youth N-8275 Ages 12-18 years Female-55% multi-ethnic-32%	Strength and difficulties questionnaire (SDQ), Binary variable derived from a question about DSH in the last 12 months	Depending on the classification method used, reported outcomes within the same nominal ethnic group varied by an effect size (d) of up to 0.12, and the reported magnitude of difference between nominal ethnic groups varied by an effect size (d) of up to 0.25.
Glenn et al (2019), USA	RCT and others	Youth Age-10-19 years N-42 articles	NA	The review indicates promising treatments for reducing SITBs in youth, with efficacious interventions typically involving a significant family or parent training component and skills training.
Freeman et al (2016), USA	Not indicated	Adolescents	Not indicated	The review identified several inconsistencies and limitations across the six studies analysed, including mixing various forms of self-harm, variations in diagnostic inclusion/exclusion criteria, inadequate use of standardized self-harm outcome measures, variable treatment lengths and intensity, and insufficient attention to DBT adherence
Biernesser et al (2020), USA	Not indicated	Youth	Mixed methods appraisal tool	The review revealed opportunities for both risks and benefits associated with social media use and explored potential influences on subgroups of youth vulnerable to suicide.
Scourfield et al (2011), England	Qualitative study using focus groups and interviews	Youth N-69 Age-16-25 years	Thematic coding and discourse analytic approach for data analysis	Some youth self-harm because of distress, others also self-harm to get attention
Boxer (2010)	Not indicated	Youth (adolescent inpatients), n-476	Not indicated	Some important similarities were observed between the NSSI-only and NSSI+SA groups.
McAuliffe et al (2014), Ireland	Not indicated	N-433 Age: 18-64 years	Structured group problem-solving skills training programme as an intervention approach for self-harm	The results showed that the treatment groups did not differ in rates of repeated self-harm at 6-week, 6-month, and 12-month follow-up. Both treatment groups showed significant improvements in psychological and social functioning at follow-up.

Authors, year, country	Study design	Sample characteristics	Assessment tool (s)	Summary of findings
Lowenstein (2005), UK	Not indicated	Not indicated	Not indicated	It highlights that intentional self-harming is more common among girls and is often difficult to distinguish from suicide ideation. The most prevalent methods of self-harming include self-poisoning, overdosing, cutting, and jumping from the high places. The reasons for self-harming behaviour vary, including seeking attention, releasing negative emotions, and dealing with family, relationship, and sexual problems. Young people engaging in the self-harming often suffer from depression, anxiety, impulsivity, low self-esteem, as well as the suicidal thoughts.
Aggarwal et al (2017), Australia	Not indicated	Youth	Not indicated	The prevalence rates of youth self-harm in low and middle income countries (LMICs) were found to be comparable to those in high and income countries (HICs). The review suggests that family-based interventions may be valuable for both treatment and prevention
Sinha et al (2021), India	Survey	Adolescents Boys-5,969 Girls-9,419 Age-10-19 years.	Not indicated	The study found that internet access, parental abuse, involvement in fights, and depressive symptoms were significant predictors of DSH among adolescent boys and girls. Adolescents who had internet access and experienced parental physical abuse were more likely to engage in DSH. Additionally, adolescents with moderate or moderately high/severe depressive symptoms had significantly higher odds of deliberate self-harm.
Evans et al (2005), UK	Survey	Adolescents N-6020 Age-15-16 years	Not indicated	The study found that adolescents who engaged in deliberate self-harm or had thoughts of self-harm were more likely to identify themselves as having serious problems compared to other adolescents. They also reported using different coping strategies, showing less focus on problems and more avoidant behaviors. The study suggests that preventive strategies, including educational programs on emotional health and coping, are important for addressing self-harm among adolescents, and there is a need for improved clinical care for adolescents identified as at risk or having engaged in self-harm.
Mitchell (2007), USA	Survey	Internet users N-1500 Age-10-17 years	N/A	The study found that youth reporting deliberate self-harm were significantly more likely than other youth to have a sexual screen name, talk with people known only online about sex, and use chat rooms. They were also more likely to have a close relationship with someone they met online. Three-quarters of youth reporting self-harm used the instant messaging.

These behaviours might indicate a degree of impulsivity, a search for validation or attention, and possibly a heightened need for social interaction, which could be tied to the broader context of DSH. This highlights the influence of cognitive constructs and personality traits in DSH among youth.

Moreover, the study's identification of a connection between self-harm and maintaining close relationships with individuals met online suggests a potential psychological dynamic. This behaviour might stem from feelings of isolation, seeking empathy, or creating a sense of belonging in a virtual space. The prevalence of instant messaging among those reporting DSH could further indicate a preference for immediate communication and emotional expression, possibly reflecting underlying cognitive tendencies or emotional regulation challenges.

The findings presented by dovetail with the observation that almost half of the youth engaged in DSH also report high Internet use- twice as frequent as their non-self-harming counterparts.^{20,27,31} This high prevalence of Internet engagement among self-harming youth could imply a correlation between cognitive patterns and personality traits that drive both self-harm and extensive Internet use. Such patterns might encompass impulsivity, seeking immediate gratification, or a preference for virtual interactions.

Furthermore, the correlation between self-harm and Internet use suggests that the online realm is a significant platform for youth with self-harm tendencies. The prevalence of instant messaging and the elevated use of chat rooms among self-harming youth underscore the role of interactive online communication as a potential avenue for timely intervention. This aligns with the broader understanding of how cognitive constructs and personality traits manifest in specific online behaviors, emphasizing the need for tailored support services.

This systematic review has brought to fore the complexities between cognitive factors, emotional tendencies, and personality traits that contribute to the development of DSH behaviours. While more research is still being carried out in this field, past studies have highlighted the importance of these psychological branches in contributing to the exposures and reasons underlining DSH among youth. There was inadequate reporting of study details or outcomes in the included literature. This made it challenging for us to conduct further investigation into heterogeneity. Lack of access to detailed study protocols and also variability in study design made it difficult for us to do any meaningful analysis.

Contribution to knowledge

Our study highlights a significant gap in the existing research landscape concerning DSH behaviours among youth. Specifically, there is a scarcity of studies that explicitly delve into the examination of cognitive

constructs and personality factors in this context. This gap highlights the need for further investigation in this critical area of research.

Furthermore, our findings provide compelling evidence of the paramount role that emotional regulation plays in the context of DSH behaviors. This aspect cannot be understated and calls for a concerted effort to address emotional challenges as a proactive preventive measure.

Additionally, our study brings to light the relationship between online engagement and self-harm tendencies among youth. This discovery has important implications, emphasizing the importance of tailored interventions aimed at both prevention and addressing DSH in this demographic.

Implications for clinical practice

Mental health professionals can develop interventions tailored to address these underlying factors. Interventions can focus on enhancing emotional regulation skills, teaching adaptive coping strategies, and fostering healthier thought patterns.

Early detection in the form of screening for traits such as impulsivity, sensation-seeking, and emotional dysregulation can help identify individuals at higher risk of engaging in self-harm behaviors. This can prevent the escalation of DSH behaviours and promote healthier ways of coping.

This review will offer mental health professionals an insight to focus their efforts in addressing the underlying psychological motivations that drive DSH behaviours instead of focusing solely on symptom management

Given the influence of online behaviours on self-harm tendencies, mental health practitioners can explore the potential of online interventions to reach and support youth at risk. Online platforms can provide a safe space for adolescents to seek guidance, learn coping strategies, and engage in therapeutic activities that target cognitive constructs and personality factors related to self-harm behaviours.

Future research

There is a compelling need for more extensive research efforts to explore the roles of cognitive constructs and personality traits in DSH behaviours among youth.

Limitations

It is important to point out that due to limitation in available data we did not undertake assessment. We could also conduct sensitive analysis to assess the robustness of the synthesized results. We also wish to report that we were unable to contact authors to get information regarding missing data. Also, the manner in which data was reported

varied greatly among the studies, which made it challenging to gather and compare summary statistics or effect estimates systematically. This inconsistency might be due to differences in how the studies were designed, carried out, or how their results were reported. There was inadequate reporting of study details or outcomes in the included literature. This made it challenging for us to conduct further investigation into heterogeneity. Lack of access to detailed study protocols and also variability in study design made it difficult for us to do any meaningful analysis. As a result, we wish to caution that readers should be cautious with the outcome of our findings as this unavailable information could potentially change the outcome.

The limited but promising evidence presented in this review sheds light on the need for further research efforts in this domain. If we have a broader understanding of the relationship between cognitive constructs, personality profiles and DSH, it will afford researchers to understand the psychological principles that affect this relationship. Also, knowledge in this area will form the basis for interventions to address the root cause of self-harm and promote effective coping strategies.

CONCLUSION

In conclusion, this review brings out the critical role of cognitive constructs and personality traits in understanding DSH behaviours among youth. Despite the limited number of studies, the available evidence highlights the need for more research to better define these relationships and guide targeted interventions. Addressing emotional regulation and impulsivity, as well as risky online behaviours, can offer promising pathways for early detection and effective prevention strategies.

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