

Which Is The Role of Social Media in Web-Based Adolescent Non-Suicidal Self-Injury (NSSI)?

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Abstract: In recent years, there has been a significant surge in non-suicidal self-injury (NSSI)-related content on the Internet. In fact, the technology landscape rapidly evolved, with social media now playing a pivotal role in the lifestyle of the general population, particularly among youths and adolescents. The current review aims at overviewing all studies so far published investigating the relationship between social media and NSSI among adolescents, focusing on the motivations behind posting NSSI-related contents and the role that social media may play in the promotion and/or maintenance of NSSI behaviors. A comprehensive systematic literature review was carried out by using MEDLINE/PubMed. Following screening through established inclusion criteria, eleven studies were finally selected and here retrieved. Due to the high methodological heterogeneity, all studies were assessed and categorized, based on the type of data collection, in three groups: a) studies using direct data (e.g., interviews/surveys); b) indirect data (e.g., content analysis on social media); and, c) mixed data. Major findings reported that social media may significantly influence the development and maintenance of NSSI behaviors. Those victims of cyberbullying often seek out pro-self-harm contents, to both normalize the behavior and/or seek peer-to-peer emotional support. Social media platforms facilitate the dissemination of self-harm techniques and encourage competition among users, exacerbating the severity of self-injury. Interviews highlighted motivations such as attention-seeking, expressing emotions, and feeling part of a group. Other studies showed that social media contents often contain both supportive and harmful advice regarding self-harm. Social media could cover a dual role in both providing support and triggering self-harm through exposure to harmful content(s). Furthermore, social media could also offer opportunities for positive interventions (i.e., awareness campaigns, mental health resources, etc.). Mental health professionals should be aware about the impact of social media on youngsters, as well as providing a routine assessment on social media use in their clinical practice. Future research should explore the (bi)directional causal role of social media on NSSI and viceversa, as well as developing preventive and treatment strategies to support young people to disincentive NSSI behaviors via social media.

Keywords: Adolescent, Adolescence, Deliberate Self-Harm (DSH), Non-suicidal Self-injuries (NSSI), Self-harm, Social Media, Web.

1. INTRODUCTION

Self-harm is a wide concept, including suicidal ideation, suicidal gesture, deliberate self-harm, tattooing, piercing, and other para-suicidal behaviors (Solís-Bravo *et al*, 2019). Suicidal ideation is defined by the presence of thoughts about killing oneself (APA, 2018). While the suicidal crisis comprises any situation in which an individual threatens and/or attempts suicide and/or any type of suicidal behaviour (APA, 2018). More specifically, a suicidal gesture is intended as an effective (or quasi-effective) attempted suicide or any self-destructive behavior potentially able to achieve a completed suicide (APA, 2018). Deliberate self-harm (DSH) is an intentional, direct destruction of body tissue (most commonly by cutting, burning, scratching, self-hitting, self-biting, and head banging) without a real conscious suicidal intent, even though resulting in a real severe injury able to determine a tissue damage

(APA, 2018). By definition, DSH is distinguished from suicidal behaviors involving a real and conscious intent to die, even though it could be potentially life-threatening. DSH has been reported to occur also among non-psychiatric clinical samples of youths and adolescents, as well as among those individuals with intellectual disorders and/or neurodevelopmental disabilities (APA, 2018). The term 'parasuicide' is used to define a range of behaviors (also including DSH) comprising all behaviours and/or acts without a definitive suicidal intent that could be associated or not with an exitus, such as the 'passive suicide' (i.e., failing to feed oneself or to engage in rudimentary self-care) (APA, 2018).

From an epidemiological perspective, suicide accounts for more than 700,000 deaths per year. Suicide affects all age groups and represents the fourth leading cause of death among individuals aged 15–29 according to the World Health Organization (WHO) (2022). Globally, it has been estimated that around 1.3% of all deaths in 2019 were committed by suicide (WHO, 2022). It has been estimated that for every person who died by suicide, there are at least further

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20 persons who previously committed a DSH (WHO, 2022). Literature already documented that a DSH usually precedes the occurrence of a subsequent suicidal ideation and/or behaviour, including a completed suicide (Orsolini *et al.*, 2020). A positive DSH history was found to represent a significant risk factor for overall suicidality, particularly in high-income countries and among young people aged 10-24 (WHO, 2022). In particular, it has been estimated that youths deliberately self-harm themselves during their lifetime in around 1 out of 10 cases (WHO, 2022).

Although the epidemiological picture underlined a dramatic scenario, these data could potentially underestimate the global problem, being most DSH phenomena not early identified and/or diagnosed, particularly those manifesting and/or maintained by the web (Orsolini *et al.*, 2023; Royal College of Psychiatrists, 2023). Coherently, there has been a significant surge in non-suicidal self-injury (NSSI)-related content on the Internet (Lewis *et al.*, 2014; Cipriano *et al.*, 2017). The technology landscape rapidly evolved in recent years, with social media now playing a pivotal role in the lifestyle of the general population, particularly among youths aged 15-24 (Nesi *et al.*, 2020). Indeed, social media determined both new positive and exciting social and interpersonal opportunities but also potentially detrimental challenges for mental health (Nesi *et al.*, 2020). Digital technologies become an universal feature of the young people's lives, as the exposure to screens usually begins early in the life for many youths (Nesi *et al.*, 2020; Orsolini *et al.*, 2022). In fact, it has been estimated that around 95% of adolescents aged 13-18 already have access to a smartphone and 88% own a personal desktop or laptop at home (Center PR, 2018). Moreover, according to a statistical picture related to 2018, around 45% of US adolescents reported that they were online "almost constantly," with an increasing trend compared to the last 3 years during which it was found a prevalence of 24% (Nesi *et al.*, 2020). The COVID-19 pandemic has undoubtedly led to an increase in online activity, with youths uploading videos and posts on various social networks (Orsolini *et al.*, 2022; Sampogna *et al.*, 2023). At the same time, research on social media and its impact on adolescent mental health has proliferated in recent years, with many studies exploring whether a more frequent use of social media could be much more likely associated with the occurrence and/or maintenance and/or worsening of many mental health issues (Orsolini *et al.*, 2023).

A growing phenomenon with a strong impact on young people is represented by social media challenges, defined by recording and uploading videos of oneself performing specific behaviors and then nominating others to do the same (Ward *et al.*, 2021). Some challenges may have positive intentions and are relatively safe. An example is the recent "amyotrophic lateral sclerosis (ALS) ice bucket challenge", which consisted in nominating friends or famous people and challenging them to donate for ALS and throwing a bucket of iced water over their head, posting also the video of the challenge on social network (Gualano *et al.*, 2016). However, many other challenges involve overtly risky health behaviors. Among these, there are the Cinnamon Challenge (consisting of ingesting a spoonful of cinnamon without liquid), the Tide Pod Challenge (consisting of ingesting a Tide Pod containing chemicals), and the Kiki Challenge (consisting of dancing next to a moving vehicle) (Ward *et al.*, 2021). Finally, the Blue Whale Challenge represented one of the most famous social media-induced "suicide game", firstly appeared on social media platforms like Facebook, Twitter, and Instagram in 2017 (Upadhyaya and Kozman, 2022). Apparently originating in Russia, this challenge rapidly became a worldwide phenomenon involving many European and not-European countries. The challenge lasts around 50 days, during which the "players" are instructed by "administrators" to be engaged in daily tasks involving increasingly injurious forms of self-harm until suicide. The name of the challenge originated from an unexplained phenomenon whereby whales, highly social animals that travel in herds, stray from the herd and beach themselves in a seemingly deliberate manner, causing their demise. Participants are encouraged to make videos of themselves completing their daily tasks and post these videos on social media, with the inclusion of specific hashtags. Given the popularity of this challenge, participants are frequently motivated by social media followers who progressively increase during their progress through the 50 days and depend on the number of views that they receive by posting self-harm and risky suicidality videos (Upadhyaya and Kozman, 2022). However, despite the emergence of several other Blue whale-like phenomena spread via several social media platforms, these phenomena are still scarcely scientifically investigated, particularly regarding the role of social media and these suicidality challenges via social media on NSSI and suicidality among youths.

Therefore, given the high prevalence of DSH/NSSI behaviours among youths and the capillary spread of social media use among adolescents, the aim of our comprehensive systematic review was to investigate the relationship between social media NSSI-related contents and the occurrence and/or maintenance of NSSI in the adolescent population. In particular, the major focus was identifying the main underpinned determinants in being engaged in NSSI-related contents and/or posts on social media, as well as defining the role of social media platforms in promoting and/or maintaining NSSI behaviours in real life. The final goal was to evaluate which main determinants could be targeted by preventive and/or treatment strategies in attenuating and/or largely limiting NSSI behaviours via social media.

2. MATERIALS AND METHODS

A comprehensive literature review has been carried out in order to evaluate the role of social media in the onset, development and/or maintenance of NSSI and/or DSH among adolescents. Studies were identified searching the electronic databases MEDLINE/PubMed. A combined search strategy of free text terms and exploded MESH headings was conducted for the topics of “social media” and “NSSI” as following: ((*Adolescents*[Title/ Abstract]) AND (*Self-Harm*[Title/Abstract]) AND (*Social Media*[Title/ Abstract])), without time restrictions, through May 21, 2024. In addition, further studies were retrieved from reference listing of relevant articles and consultation with experts in the field or manual search. We limited the search to only English-written studies. The following exclusion criteria have been applied: a) not human studies; b) studies discussing only protocols without clinical data; c) conference abstracts, editorials, systematic reviews, reviews, or meta-analyses. Identified studies were independently reviewed for eligibility by two authors (G.L. and L.C.) in a two-step-based process; a first screening was performed based on title and abstract while full texts were retrieved for the second screening. At both stages, disagreements by reviewers were resolved by consensus. Data were extracted by two authors (G.L. and L.C.) and disagreement was resolved by a third author (L.O. and/or U.V.) using an ad-hoc developed data extraction spreadsheet. The quality of each article was assessed based on the relevance and rigor of the research methods used, including the quality of the data collection and analysis. Data were analyzed using a narrative synthesis approach, which involved

summarizing and synthesizing the key themes and findings from the included articles. With the initial set of keywords, by integrating all databases, 404 studies were identified. After screening and selection by using inclusion criteria, only 71 articles were considered for eligibility. Of these, 36 papers were selected based on title and abstract. Finally, 11 relevant studies were included.

3. RESULTS

Figure 1 represents the PRISMA flow diagram, illustrating the process of reviewing the articles identified through the source strategy. Table 1 summarizes the main findings of the studies here retrieved. Studies were stratified into three categories: a) studies using direct data, *i.e.* those collecting data directly by the population through interviews or surveys; b) studies collecting data through the analysis of contents posted on social media, *i.e.* based on indirect data; and, c) studies including a mixed data collection.

3.1. Studies Using Direct Data

Görzig in 2016 conducted a study in which approximately 25,000 subjects aged 9-16 year-olds were interviewed at home. Questions on Internet access and use were addressed through face-to-face interviews, while sensitive topics, such as viewing web content related to suicide and psychological issues, were answered privately. This study found that searching for and viewing self-harm content is linked to being a victim of cyberbullying, identifying how social media can generate cybervictims and cyberbullying-victims who subsequently seek out these types of content.

Minkkinen *et al.* (2017) carried out a project involving 3,567 respondents aged 15-30 from different countries with similar aims to the previous study. Participants were administered a 10-minute survey in which they were asked questions about viewing pro-suicide and pro-self-harm material, about online/offline victimization and other questions about socio-demographic data. As in the previous study, Minkkinen *et al.* (2017) also confirmed that being a victim of online violence appeared to be one of the main factors driving the search for pro-suicide and pro-self-harm material on the web.

Jacob *et al.* (2017) performed a qualitative research study to investigate the influence of self-harm images

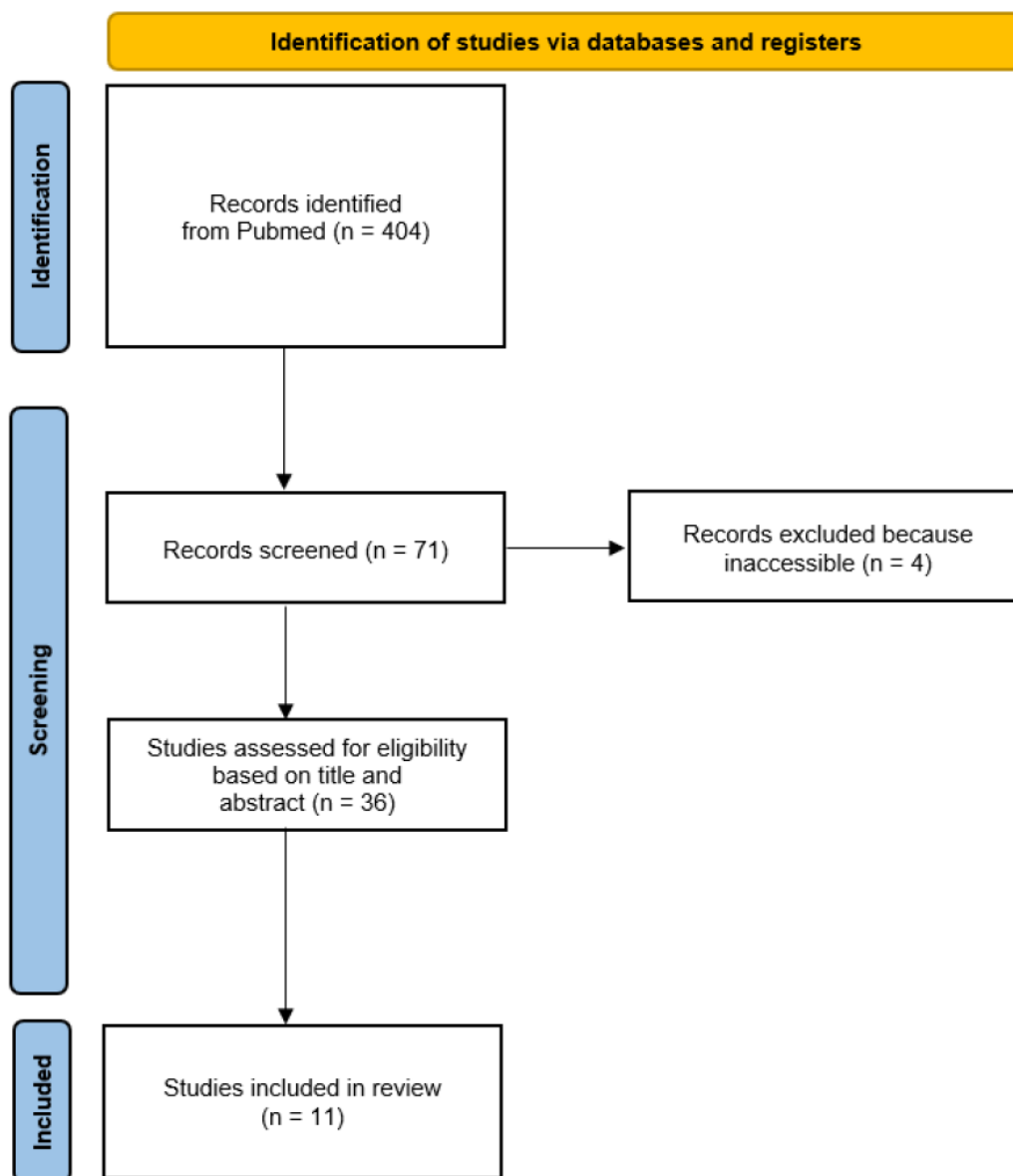


Figure 1: Flowchart illustrating the process of study search and selection in accordance with PRISMA guidelines.

on social media on young people aged 16-24 years old, who already had experienced self-harm behaviours. Subjects were recruited through Facebook but then interviewed in person. The interview was focused on the following topic: motivations for self-harm; receipt of formal and informal support; use of the Internet; navigation of the Internet prior to, during, and following engagement in self-harm; perceptions and experiences of different online content and mediums of communication; and the interaction of online behavior with real world behavior. Interviews have shown that social networks contribute to normalizing the act of self-harm by also providing emotional support, as well as enabling the spread of advice on possible techniques for self-harm. Furthermore, the Internet allowed the purchase of material for self-harm bypassing parental

control and any other checks. Watching pro-self-harm images on social media simply triggers the emulation of the act in vulnerable individuals, also encouraging them to repeat the act and even compete with others. At the same time, Tumblr appeared to be the most widely used social network for the dissemination of such images.

Carey *et al.* (2018) conducted a study on a population of adolescents (aged 9-22) hospitalized for suicidal thoughts or attempts. The patients were first administered a survey on social media use and then interviewed on issues concerning posting content and mental health. It emerged that these patients used often social media to post their thoughts, both depressive and suicidal/self-harmful. The motivations

Table 1: Summary of the Studies Included in the Study

Publication	Type of data used	Aim of the study	Sample characteristics	Study Description	Results
Gorzing, 2016	Direct data	Explore the relationship between cyberbullying and viewing of suicide-related web content	11–16-year-olds participants ($M = 13.54$, $SD = 1.68$) were interviewed, with a core sample size of 19,406 (50 percent girls).	Random stratified sample of around 25,000 Internet-using European children aged 9–16 years who were interviewed at home during spring and summer 2010. Interviews were conducted face-to-face for questions about Internet access and use, with private completion for sensitive questions, including those on viewing of suicide-related web content and psychological problems.	This study confirmed that searching for and viewing self-harm content is linked with any cyberbullying activity.
Cavazos-Reigh <i>et al.</i> , 2017	Indirect data	Analyze the depression-related content on Tumblr, specifically focusing on the most popular posts relating to depression, self-harm, and suicidal ideation. Gaining a better understanding of depression, self-harm, and suicidal content that is shared on Tumblr could be an important step towards prevention	20 Tumblr accounts (age ranged from 14 to 20 years old) were used for analysis. 200 posts were randomly selected from all posts available for each Tumblr account, including historical posts, resulting in 3,360 posts for analysis	Posts of each account were manual coded and discussed between team members. Two members of the team studied a sample of these posts and developed a list of relevant themes based on repeatedly observed topics. These senior team members trained five research assistants and those five viewed the content of the posts online and coded the posts appropriately. Any discrepancies were then discussed and resolved. Coders then examined each post and coded for the following five themes: self-loathing, loneliness/feeling unloved, self-harm and/or scars from self-harm, suicide/suicidal thoughts/death, posts of graphic images/video clips related to suicide or self-harm.	Posts and images were found on Tumblr. The content of such material was ambivalent, it provided help and support for those suffering but at the same time it advised on how to secretly self-harm and further maladaptive strategies.
Jacob <i>et al.</i> , 2017	Direct data	Evaluate the impact of online images of NSSI content on adolescent self-harm	41,988 accounts displayed the advert to participate in the study, with 744 people clicking through to the main study website. Of these individuals, 49 indicated interest in study participation by leaving their contact details. At the end, 21 individuals aged 16–24 participated in the study.	Semi-structured interviews were undertaken. Nineteen were conducted individually, and one was conducted in couple. Interviews were led by the primary researcher. The interview setting was decided through discussion between the researcher and participant, interviews were conducted at a university, library, or cafe. The interview topic guide explored young people's lived experiences of self-harm, in particular: motivations for self-harm; receipt of formal and informal support; use of the Internet; navigation of the Internet prior to, during, and following engagement in self-harm; perceptions and experiences of different online content and mediums of communication; and the interaction of online behavior with real world behavior. Data were recorded using a digital audio recording device and transcribed verbatim by a professional transcription service.	Social networks contributed to normalizing NSSI. They facilitate the spread of advice on possible techniques for self-harm. The Internet allowed the purchase of material for self-harm. At the same time, watching pro-self-harm images on social media triggered NSSI conducts. Tumblr appeared to be the most widely used social network for the dissemination of NSSI images.

Minkinen <i>et al.</i> , 2017	Direct data	Describe the relationship between victimization and exposure to pro-self-harm and pro-suicide websites	Participants survey were aged 15 to 30 years from the United States, United Kingdom, Germany, and Finland. The study included 3,513 respondents: 1,002 from the United States (49.8% men), 999 from the United Kingdom (51.0% men), 978 from Germany (49.9% men), and 534 from Finland (50.0% men). The mean age of the respondents in the final sample was 24.12, 23.18, 23.20, and 23.68, respectively.	A survey was carried out in each country. Participation was voluntary, and respondents were not paid for their participation.	The study confirmed that being an online victim appeared to be one of the main factors prompting for the search for pro-suicide and pro-self-harm content on the web.
Carey <i>et al.</i> , 2018	Direct data	Describe the use of social media in adolescents presenting for emergency care with psychiatric complaints or suicide attempts	37 individuals, aged 9–22 and admitted to the hospital with a self-harm related disorder (<i>i.e.</i> suicidal ideation, intentional overdose) were included in the study.	All the eligible individuals participated in a survey questioning social media habits, including the different types of social media platforms accessed, and the frequency of use. Participants were also asked to answer a series of questions about the use of social media to communicate mental health topics, such as if they posted any content about depression, consideration of harming themselves or statements about dying. Furthermore, it was asked to indicate how frequently content was posted, how many times before the hospitalization content was posted, and what platforms were used to post content. The survey was followed by a brief qualitative interview. Participants were asked open-ended questions about their opinion on posting content about their own mental health on social media.	The study found that individuals who post NSSI content were mainly related to seeking attention, feeling better, and as a coping strategy.

Brown <i>et al.</i> , 2020	Direct data	Qualitatively assess the motivation in young people with NSSI to share pictures of their NSSI wounds on a large social media platform; gain more insight in the reactions adolescents with NSSI have to viewing NSSI pictures online; and how those adolescents perceive comments on (their own) NSSI pictures.	Of the 100 users on Instagram who were initially approached, 64 agreed to participate in a qualitative interview regarding their experiences with NSSI on Instagram. At the end only 59 completed the interview. Participants were on average 16.7 years old (SD=1.2 years) and 72.9% were female.	Participants were identified from a larger data-set investigating the occurrence of NSSI on Instagram. All pictures and user accounts associated with the 16 German hashtags most commonly related to featuring pictures of NSSI wounds (<i>i.e.</i> #ritzen, "#cutting") were downloaded during four weeks in April 2016. After those four weeks of Instagram data collection, participants were approached via Instagram messenger and asked if they were willing to participate in an interview-based study. If they agreed, participants were included in the study. Interviews were conducted on Instagram messenger using chats, which allowed participants to stay anonymous. The interviews were semi-structured and consisted of 33 questions about the participants' experiences with NSSI and suicidality on Instagram.	The study reported that adolescents use social media to post self-harming content. One of the main reasons for posting NSSI content is to feel a sense of belonging to a group. Other participants report posting such content for the purpose of self-disclosure, raising awareness of reasons for self-injury and using NSSI for social signaling, to offer help and support to other users who practice self-injury and finally to imitate users who practice self-injury. Many others use social media as a diary to collect their experiences. Concerning the reactions provoked by the viewing of such content, participants report feeling a desire to imitate the injury and trigger the act, a desire to help others and sometimes to end the repetition of such conduct.
Lavis <i>et al.</i> , 2020	Mixed data	Explore the relationship between NSSI and social media among adolescents	10,169 original posts and 36,934 comments, both written and images, were collected at two time-points in 2018 and 2019. 10 in-depth semi-structured interviews exploring engagements with self-harm content on social media were conducted. Participants aged between 10 and 24 years.	Data was collected across Instagram, Twitter and Reddit. Self-harm content was found by inputting the hashtags 'self-harm' and 'self-injury'. Alongside data collection on social media, semi-structured interviews were conducted with ten young people who use or have used social media to engage with self-harm content. Participants were recruited through an invitation posted on a range of social media platforms. Three interviews were conducted over email, two on WhatsApp, and five via Skype. They were designed to last approximately an hour but were often longer at the direction of participants. Topic guides were semi-structured, with participants being invited to talk about any aspects of their experience of social media and/or self-harm they felt it important to highlight to the researcher.	This study showed that users often provide support to those who practice self-harm, even giving advice on how to stop practicing it. At the same time, those who provide support are exposed to self-harm contents that can trigger the need to perform it. Information on how to hide wounds, different ways of performing self-harm or how to do it in a 'safe' way (e.g. how to sterilize blades, how to use bandages) is sometimes given, prompting the chronicization of self-injury.
Nesi <i>et al.</i> , 2021	Direct data	Evaluate the role of social media towards NSSI conduct among adolescents.	589 psychiatrically hospitalized adolescents ages 11-18 (M = 14.88, SD = 1.83).	Patients who were hospitalized due to high risk of self-harm or suicide and involved in online self-injury activities were interviewed and evaluated with with specific assessment. 4 different online activities were assessed: viewing self-injury content, sharing self-injury content, talking about self-injury with peers known only online, and talking about self-injury (using technology) with peers known offline. Also digital tools used to engage in these activities were included in the study.	Results showed that social networks are usually used to post self-injurious contents for the purpose of feeling part of a group, normalizing self-injury and meeting users with the same difficulties. At the same time, seeing NSSI contents trigger viewers to practice NSSI conducts, even leading to competition between them.

Weinstein <i>et al.</i> , 2021	Direct data	Explore social technology use among adolescents hospitalized for suicide risk.	30 adolescents (mean age = 16.1 years, SD = 1.6, range = 13.1–18.4) hospitalized in an urban inpatient psychiatry unit.	Patients were interviewed using a semi-structured protocol. Interviews were conducted in private areas of the inpatient unit by two-person teams composed of a lead interviewer and a second interviewer who took notes and provided an additional monitor. Interviews typically lasted ~30 min (M=28.2 min, SD = 8.3). Participants also completed self-report measures (e.g., demographics) on an iPad. The interviews aimed at understanding the participants' uses (positive and negative) and their views on disconnection during hospitalization and expected return after hospitalization. The interviews focused on typical (past) uses when they were not hospitalized, current experiences of disconnection and future expectations after discharge.	Watching specific posts on social media can trigger self-harm, whether intentionally or unintentionally
Liu <i>et al.</i> , 2023	Direct data	Explore the relationship between cyber victimization and NSSI conduct.	1,006 adolescents (51.78% girls, n = 521) ranging in age from 12 to 15 (M _{age} = 13.16, SD = 0.67).	Participants were recruited from three junior middle schools in Guangdong province, southern China, through stratified and random cluster sampling. Participating adolescents spent 30 min in their regular classroom completing a series of self-report questionnaires. Data were collected by trained psychology teachers or graduate psychology students.	Results showed that cyber victimization is a risk factor for NSSI and cybervictimization is a predictor of depression, which is strongly linked to NSSI.
Orsolini <i>et al.</i> , 2023	Direct data	Investigate the NSSI phenomenon mediated by social networks by exploring the impact of a problematic social media use and FOMO on NSSI-related contents on social networks and/or the occurrence of NSSI behaviors, within a sample of young adults (aged 18–24).	404 participants with a mean age of the sample is 21.1 (SD = 2.7)	A survey was spread among different social networks. A set of socio-demographic and clinical variables, including participants' age, sex, gender identity and level of education (in years), use of social networks (specifically), use of social networks and which one specifically, were collected. I was also asked participants if they ever searched for Risky Social Media Challenges (RSMCs) on social networks and the main reason/motivation for looking for them. Moreover, a set of self-rated questionnaires were requested to be filled out.	A proportion of the sample reported watching content on self-harm for curiosity, seeking help, pleasure, feeling they belong to a group, learning how to practice self-harm and popularity. NSSI behavior appears to be associated with both having a social media addiction and being affected by FOMO. In particular, FOMO represented a predictor for engaging in self-harming conducts.

M: mean; SD: standard deviation; NSSI: non-suicidal self-injury ; FOMO: fear of missing out.

for these individuals to post such content were mainly related to seeking attention (especially from those who self-harm), feeling better, and as a coping strategy (it helped them to express their own emotions and improve their psychological distress).

Brown *et al.* (2020) used Instagram to conduct a study to investigate the motivations and effects of posting content related to self-harm. Specifically, they selected a number of Instagram profiles that had posted content about self-harm and then conducted an

interview via private chat with the owners of these profiles. The interview included 33 questions about NSSI and suicidality on Instagram. These individuals report using social media to post self-harming content. One of the main reasons they report posting such content is to try to belong to a group, as they are often not understood by family members. Others report posting such content for the purpose of self-disclosure, raising awareness of reasons for self-injury and using NSSI for social signaling, to offer help and support to other users who practice self-injury and finally to imitate

users who practice self-injury. However, many others use social media as a diary to collect their experiences, without specific reasons. Concerning the reactions provoked by the viewing of such content, participants report feeling a desire to imitate the injury and trigger the act, a desire to help others and sometimes to end the repetition of such conduct.

Nesi *et al.* (2021) also conducted a study on the population of young in-patients aged 11 to 18 years, hospitalized due to risk of harm to self or others. A total of 589 subjects were interviewed and recruited, investigating the type of use of social media and the practice of self-harm. It has been observed how social networks are used to post self-injurious contents for the purpose of feeling part of a group, normalizing self-injury and meeting users with the same difficulties. At the same time, seeing NSSI contents acts as a trigger to start practicing such self-harm conducts, even leading to competition between them.

Weinstein *et al.* (2021) recruited from a large urban inpatient psychiatry unit a group of patients who were hospitalized for a suicide attempt or severe suicidal ideation. Interviews were conducted by two-person teams composed of a lead interviewer (first author, consistent across interviews) and a second interviewer who took notes and provided an additional monitor. The questions were mainly about patients' use of social media. In this study, it was found that watching posts about NSSI on social media can trigger self-harm, whether intentionally or unintentionally.

Liu *et al.* (2023) carried out a study on middle school students aged between 12 and 15, trying to investigate whether there is a relationship between NSSI and being a cyber victim. Participants took a survey to identify NSSI behavior, depressive symptoms and having been a cyber victim. According to this study, cybervictimization is a risk factor for NSSI and cybervictimization is a predictor of depression, which is strongly linked to NSSI.

Orsolini *et al.* (2024) carried out a survey through social media platforms to investigate the relationship between NSSI, social media, fear of missing out (FOMO) and social media addiction. In this study, a proportion of the sample reported that they watched content on self-harm for curiosity, seeking help, pleasure, feeling they belong to a group, learning how to practice self-harm or popularity. Furthermore, NSSI behavior appeared to be associated with both having a problematic use of social media and being affected by

FOMO. In particular, FOMO represented a predictor for being engaged in self-harming conducts.

3.2. Studies Using Indirect Data

Cavazos-Rehg *et al.* (2017) carried out a study by analyzing content on Tumblr. In particular, the terms 'depression' and 'suicide' were used as keywords to search for profiles and posts. Based on the profiles reporting an age, the age range was between 14 and 20 years. Regarding self-harm contents, both graphic content with pictures and simple posts were found. The content of such material was mainly constituted by two themes: a) providing help and support for those suffering of suicide and/or NSSI and/or depression with suicidality; or, b) providing advice on how to secretly self-harm and adopting other maladaptive strategies to manage a psychological discomfort. However, among positive comments, only a small proportion provided real advice to seek out a mental health therapist or a psychiatrist.

3.3. Studies Using Mixed Data

Lavis *et al.* (2020) conducted a study in which they analyzed contents posted on Instagram, Reddit and Twitter, by using the keywords "self-harm" and "self-injury" within the hashtags, posts or comments. In a second phase, the authors conducted interviews with some users (aged 10-24) who posted self-harm related contents on social media. The results showed that users of these social networks often provide support to those who practice self-harm, even giving advice on how to stop practicing it. However, another finding confirmed also that those who provided support were indeed exposed to self-harm contents that can trigger the need to act such acts again and even practice them. Moreover, findings also reported that the support should be continuous, otherwise it may push towards a progressive worsening of such conducts, by confirming the need for constant professional support. In addition, information on how to hide wounds, different ways of performing self-harm or how to do it in a 'safer' way (e.g. how to sterilize blades, how to use bandages) seemed to facilitate the chronicisation of self-injury behaviours.

4. DISCUSSION

The current review aimed to investigate the role of social media in potentially determining the occurrence and/or facilitating the maintenance of self-injury behaviors, by exploring the possible contributing and/or risky factors, with the final goal to build preventive

strategies able to limit or extensively reduce social media-related health-damaging behaviors, particularly among young people. In our systematic review, 11 studies have been included and here retrieved, of these 9 studies investigated the phenomenon by using direct data collected through interviews to the target population, 1 study analyzed contents published on social media, by collecting posts, hashtags and comments, while 1 study used a mixed data collection methodology. Overall, despite the literature on the topic appearing to be more huge, the number of papers here included are relatively few. This is mainly due to our established inclusion criteria which selectively included only studies specifically investigating the reasons on individuals' posting NSSI-related contents via social media and the role of social media in the occurrence and/or maintenance of NSSI behaviours in real life. The excluded studies were related to the use of social media and self-harm, without giving any further information or explanation about the motivation(s) and/or the (con)causal role.

Overall, according to the literature here retrieved, social media seemed to play a role in promoting the development of self-harming/NSSI/DSH behaviors. Being cyber-bullied or being a cyber-victim via social media seemed to expose the subject to stress and/or psychological discomfort which could further worsen and/or exacerbate the onset of self-harming/NSSI/DSH behaviors (Görzig, 2016; Minkinen *et al.*, 2017; Liu *et al.*, 2023). Moreover, providing self-harming/NSSI/DSH-related contents via social media indeed appeared to facilitate a normalization of the act. This could incentivize those more vulnerable subjects to use self-harming as a dysfunctional way for expressing own frustration and/or psychological distress (Jacob *et al.*, 2017; Carey *et al.*, 2018; Nesi *et al.*, 2021) and potentially triggering the transition from self-harm ideation to the behaviour itself (Jacob *et al.*, 2017; Brown *et al.*, 2020; Lavis *et al.*, 2020; Nesi *et al.*, 2021; Weinstein *et al.*, 2021). In fact, it has been also supposed that sharing self-harming/NSSI/DSH-related contents via social media could indeed provide some psychological comfort and/or emotional support for those self-harming individuals, who could often use social media to seek out other self-harmers and/or to receive attention and/or peer-to-peer comparison and/or emotional support (Jacob *et al.*, 2017; Carey *et al.*, 2018; Lavis *et al.*, 2020; Nesi *et al.*, 2021). However, attention-seeking behaviours could act as a "double-edged sword" as such support must be constantly maintained over the time and the social media dynamics do not necessarily guarantee this

continuity. For this reason, the support mediated by social media could trigger some psychological mechanisms which could worsen and/or maintain self-harming itself (Lavis *et al.*, 2020). In fact, seeing themselves as no longer supported (via social media), it could facilitate the tendency to act self-harming/NSSI/DSH even more frequently and severely, with the aim to achieve again the needed peer-to-peer attention and support (Lavis *et al.*, 2020). This mechanism facilitated by social media could incentivize the creation of social media groups which could help those individuals who need to feel themselves belonging to, although also it could contribute to a higher dissemination of self-harming/NSSI/DSH-related contents via social media (Jacob *et al.*, 2017; Brown *et al.*, 2020; Nesi *et al.*, 2021; Orsolini *et al.*, 2024). In addition to those contents already above described, social media contents also include information on various techniques on how to practice self-harm, how to hide your scars or on how to stop but turning to other dysfunctional strategies (Jacob *et al.*, 2017; Cavazos-Rehg *et al.*, 2017; Carey *et al.*, 2018; Lavis *et al.*, 2020). In addition, there is also shared on social media information on how to perform in a 'safer' way self-harming conducts (*e.g.* how to disinfect wounds, how to bandage them, etc.) (Lavis *et al.*, 2020). Furthermore, as a consequence of grouping dynamics, it has been also reported a tendency to compete and overcome other NSSI/DSH-related experiences, by worsening the frequency and/or severity of own self-injury behaviours (Nesi *et al.*, 2021).

Curiosity may be a reason for some individuals to look for self-harming-related contents on social media, together with the desire of achieving some popularity or for a mere 'pleasure' (Orsolini *et al.*, 2024). Some subjects also declared to use social media to look for and buy all materials needed to perform self-harming, bypassing parental control (Jacob *et al.*, 2017). While some individuals declared to use social media as a sort of own diary in which they can tell their own history, also related to NSSI/DSH-related experience (Brown *et al.*, 2020). Finally, being addicted to social media (or manifesting a problematic social media use) appeared to be much more likely associated with the self-harming practice, probably due to the higher exposure to potential NSSI/DSH triggers (Orsolini *et al.*, 2024). According to the studies here retrieved, self-harming contents were much more likely posted on Tumblr, Instagram and Snapchat social media platforms (Jacob *et al.*, 2017; Cavazos-Reigh *et al.*, 2017; Orsolini *et al.*, 2024).

The included studies in this literature review have some limitations. The different studies often used ad hoc and not standardized interviews and questionnaires that often did not allow the comparison across studies due to the heterogeneity structure used. Therefore, this could infer the interpretation and generalization of our main findings. In addition, some of the interviews were conducted via chat, facilitating the possibility for users to lie and/or falsify their answers. Age in some profiles was also absent, preventing a proper age assessment. Data from social networks may also be complex and confusing to be analyzed, especially due to the poor chance to assess the identity and personality features of the subject behind the profile. Finally, the literature much more likely focuses mainly on evaluating whether any association and/or relationship exists between NSSI and social media, but failing in deepening and providing possible underpinned explanations that would allow a closer understanding of the phenomenon. Indeed, this could limit the use of the current findings for developing clinical practice guidelines for mental health professionals but also for guiding in the development of targeted preventive and treatment strategies.

Although social media could effectively incentivize and/or facilitate the maintenance of NSSI/DSH behaviors, particularly among youngsters, their use should not be necessarily demonized at all, as social media could offer opportunities for positive interventions, such as awareness-raising campaigns, peer support and the possibility to increase awareness and the access to mental health resources (Brown *et al.*, 2020). Alerts have also been implemented over the years to prevent more vulnerable people (particularly youths) from looking for dangerous contents via social media, by disseminating information on how to seek professional psychological and/or psychiatric help (Smith & Cipolli, 2022; Vera, 20223; Lookingbill & Le, 2024). Therefore, a balanced approach to social media is essential and needed to minimize the risks and maximize the benefits of social media. Furthermore, it is crucial for mental health professionals to be aware about the impact of social media on adolescents' self-harming behaviors, by integrating also specific assessment tools and preventive interventions in their clinical practice about problematic social media use as well informative interventions on NSSI/DSH via social media. Therapeutic interventions could include education about the risks of social media, alternative (more functional) coping strategies to manage psychological discomfort and/or stress, and strengthening offline and online support networks (also including dedicated channels on social media which

could directly provide contacts of mental health professionals).

In conclusion, understanding the role of social media in self-harm and promoting a safer and more responsible (less problematic) social media use among youths represent key topics needed to be rapidly addressed in social psychiatry. Future research should continue to explore these dynamics and develop preventive as well as effective interventions to support (both online and offline) young people in a safer manner, while also attempting to early identify the underpinned mechanisms of self-harming behaviors via social media.

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CONFLICTS OF INTEREST

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