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Why social media could be dangerous? Suicide risk and mental health challenges in adolescents during COVID-19 pandemic. A narrative review of the literature

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ABSTRACT

Background: Suicide is the second leading cause of death in children and adolescents between the ages of 10 and 19. The reason for high suicide rates among young people are complex, including exposure to harmful content online. Misuse of social media and the spread of online challenges have contributed to the increased suicide risk in adolescence. The aim of this review is to explore the relationship between the phenomenon of online challenges and suicide risk in adolescents.

Method: We examined review and original studies in the last fifteen years, concerning “social media”, “challenges online”, “suicide risk in adolescents” and “Covid-19”. Articles were read in full when titles and abstracts were consistent with the objective of our study.

Result: In conclusion, social media and the age of access to the Internet have changed over time. Young people are increasingly exposed to the potential perils of the Internet, moreover, the Covid-19 pandemic has led to an extreme level of social network use possibly contributing to the increased suicide risk and rates.

Conclusion: Direct or indirect access to dangerous content represent a risk factor for vulnerable populations, however, social media can also be used as a protective measure, by increasing awareness and promoting digital education on digital platforms themselves.

Keywords: Social media, Online challenges, Suicide risk, Adolescence

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Introduction

Suicide is the second leading cause of death in children and adolescents between the ages of 10 and 19 (Breslin et al., 2020), the causes of which are indeed heterogeneous. However, there seems to exist enough evidence and rationale to consider exposure to harmful content online a contributing factor.

At the macro level, there is evidence regarding the relationship between the level of Internet use and suicide rates (Shah, 2010), as well as between the use of electronic devices and social media in specific and prevalence of depressive symptoms, social anxiety, substance use, and suicidal ideation (Twenge et al., 2018; Li et al., 2014). The maladaptive and excessive use of the Internet has been shown to have a significant impact on mental health, especially among vulnerable populations (Sumner et al., 2019). It's crucial to highlight that problematic Internet use can interact with intricate psychological variables, elevating the risk of severe mental health issues, including suicidal tendencies. A growing body of scientific evidence underscores a clear link between emotional dysregulation—often exacerbated by maladaptive Internet use—and a propensity for suicide in young individuals (Benton et al., 2021; Deutz et al., 2016). This suggests that young people grappling with emotional management, potentially exacerbated by excessive Internet use as an escape or coping mechanism, may confront an elevated risk of suicidal ideation and behaviors. Moreover, it's become evident that intense mental anguish, often sparked by negative emotions such as guilt, shame, and despair, can become so overwhelming that it markedly impairs an individual's physical, psychological, and social well-being (Lear et al., 2018). In some instances, maladaptive Internet use might amplify these emotions, heightening the risk of suicide. Studies indicate that the Internet can both positively and negatively influence self-harming and suicidal behaviors among the youth (Messina et al., 2011). While there's evidence of online support and the normalization of self-harm, there's also the dissemination of information on self-harming methods and varied reactions, which include reduced isolation and the reinforcement of positive behaviors like seeking help (Daine et al., 2013). Nonetheless, some questions persist, particularly concerning specific Internet pathways that might present elevated risks. Both Internet addiction and pro-suicide websites are recognized as significant risk factors. Additionally, the nature of online content related to self-harm has evolved, with a rise in the use of graphic imagery (Biddle et al., 2016).

Research underscores both detrimental and beneficial impacts of the Internet on self-harming and suicidal behaviors. There exists a disparity between adolescent digital culture and the perspectives of mental health professionals regarding online engagements (Lewis et al., 2011).

It's worth noting that young individuals who have faced adverse events or trauma might be especially susceptible to mental anguish and heightened suicide risk (Xie et al., 2014). Furthermore, diagnoses of mood disorders, anxiety, substance use disorders, psychotic disorders, and/or personality disorders during adolescence correlate with a notable increase in suicidal tendencies and adverse social outcomes in adulthood (Chartier et al., 2022; Gili et al., 2019). Therefore, recognizing the intricate relationship between problematic Internet use, emotional dysregulation, mental anguish, and suicide risk among young individuals is paramount. Effective preventive measures should address not only maladaptive Internet behaviors but also bolster emotional management and ensure early detection and intervention for mental health disorders to mitigate suicide risks during adolescence.

COVID-19 emergency lockdown seems to have contributed to a significant increase in mental health problems during the last years (Hageman et al., 2021; Cousien et al., 2021), maladaptive use of social media, and growing participation in online challenges, which are generally implemented by making short videos in which, following a performance, other people are urged to repeat the same actions (Ortega-Baròn et al., 2022). Several studies suggest that one of the main reasons why specific challenges become viral on the Internet is the need for social belonging in the followers (Burgess et al., 2018). Feeling accepted and included by peers is crucial for positive development and online challenges may become a means by which adolescents can feel part of a group (Ferreira-Deslandes et al., 2020). The Internet and social networks play an increasingly more central role in the lives of young people, and the desire to be accepted is often gratified by one's success online, the number of followers accumulated on Instagram, and number of "likes" a photo or video on one's social profile receives. With this in mind, online challenges represent a tool to achieve reputation, notoriety or to be accepted in a community.

For example, one of the most famous online challenges that went viral was the ice bucket challenge, in which celebrities dumped a bucket full of ice on themselves with the aim of raising awareness about amyotrophic lateral sclerosis (ALS) and promoting donations for scientific research (Khasawneh et al., 2021).

Although most of the times they are simple sources of recreation and fun, or solidarity tools, online challenges can also have dark implications in the case of extreme challenges and high-risk endurance tests. This category of challenges can be considered an insidious evolution of cyberbullying and maybe one of the most harmful aspects of the Internet for adolescents. One such example is the Blue Whale Challenge, a dangerous social game consisting of 50 different trials that incite the player to engage in self-injurious behaviours and culminating in a final

challenge that consists of the fatal event of suicide (Lupariello et al., 2019). An exploratory study conducted by Ortega Barón et al. (2022) on a sample of 417 students found that the most frequent challenges to which adolescents adhere are social challenges (80.3%), followed by solidarity challenges (20.6%), and finally dangerous challenges (7.7%). Although the latter are the least frequent, this percentage should not be underestimated due to their dramatic outcomes (Ortega-Baròn et al., 2022).

Considering these aspects, it is important to start teaching digital literacy starting from a young age, specifically regarding the harms to which adolescents are exposed to, and the means to prevent these dangerous challenges, as access to self-injurious or violent content can normalize this type of behaviours (Villani et al., 2019; Dardas et al., 2021). The purpose of this review is to explore the relationship between the phenomenon of online challenges and suicide risk in adolescents.

Epidemiology

Nonfatal self-injury (NFSI) is a significant public health problem which is prevalent across different age groups and populations. However, absence of a general agreement on its definition and the diagnostic criteria hinder a reliable and valid assessment of its epidemiology and differentiating it from suicidal behaviour (Klonsky et al., 2011). NFSI is relatively prevalent among adolescents and young adults, and the mean age at onset of NFSI has been estimated to be 16 years (Klonsky et al., 2011). Suicide and NFSI can be considered the main mental health problems during adolescence as according to the World Health Organization (WHO), suicide is the second leading cause of death amongst those between 15 and 29 worldwide (World Health Organization, 2015). In Italy, incidence of suicide amongst adolescents and young adults under the age of 24 amounts to 1,4/100.000 person-year and is 4,4 times more prevalent in males than in females (Istituto Nazionale di Statistica, 2017).

Suicide is quite unusual when compared to NFSI. This sentence suggests that suicide, in comparison to nonfatal self-injury, is not a common occurrence. It implies that while nonfatal self-injury may happen more frequently, suicide is relatively rare in comparison (Hawton et al., 2012). Suicide and NFSI are quickly growing among adolescents and young adults. Over the past decade, from 2006 to 2016, rate of suicide among youth aged 10-24 years in the U.S. have increased by 39,1 % (Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, 2018). Moreover, rates of Emergency Department (ED) visits for NFSI in the U.S. have also increased precipitously. A recent study assessing data from 2001 to 2015 showed that ED visits for self-harm augmented for almost 50,6 % over this period, with

significant increases from 2008 onward (Mercado et al., 2017; Pompili et al., 2015). However, the COVID-19 pandemic is a significant stressor for adolescents, which could further increase their prevalence of Nonfatal Self-Injurious Behavior (NFSI), as reported by Hasking et al. (2021). This is supported by the research findings of Ougrin et al., which showed that psychiatric emergency presentations related to NFSI for children and adolescents increased from 50% in 2019 to 57% during the COVID-19 lockdown in 2020 (Ougrin et al., 2021). While psychosocial factors for NFSI have been extensively studied, there is limited literature that highlights the composition and structural changes of these factors caused by the COVID-19 pandemic. It remains to be determined what factors have led to the increase in NFSI among adolescents.

Method

The selected studies were identified using PubMed, Scopus, and Google Scholar databases via the following keywords in their title/abstract: “social media”, “Suicide risk in adolescents” “challenge” and “Covid-19”. Retrieved articles were read in full when titles and abstracts were consistent with the objective of our study. Following this procedure a total number of 41 relevant publications were selected.

Suicide, Nonfatal Self-Injury, and social media

NFSI can be defined as the intentional damage of one’s own body tissue without clear suicidal intent, and generally committed to achieve relief from mental distress (Klonsky et al., 2011). The techniques used by 70-90% of people committing NFSI include cutting, scratching, or scraping of the skin and less conventional methods are banging oneself, bruising, and self-hitting in 21-44%, and finally burning in 15-35% (Briere et al., 1998). Other forms of self-injury include biting, skin-picking, wound-excoriation, and atypical bone-breaking, however, most people with self-injuries use more than one technique (Klonsky et al., 2011; Briere et al., 1998). It is widely held that NFSI characterize an expression of overpowering negative sentiments, and that they can be meaningful antecedents of suicide (Nock et al., 2006). The differentiation of NFSI from suicide attempts is not straightforward, as suicidal ideation may co-occur with NFSI, and because NFSI is a risk factor for suicide, specifically among psychiatric patients and those who have needed hospitalisation (Hamza et al., 2012). A

limitation of studies concerning self-injury is that they generally do not clearly separate the presence or the level of suicidal intent, which makes it problematic to estimate rates of NFSI versus suicide attempts. Nonetheless, numerous studies indicate an association between apparent NFSI and prospective suicidal behaviour. This association appears to be independent of gender, age, and the method of the self-injury, and to amplify with further frequent episodes of apparent NFSI (especially > 20), a longer history of NFSI, employing multiple self-injury methods (≥ 3), reported lack of pain, and an instant relief of distress after a NFSI. Additionally, clinical factors such as severity of psychiatric conditions and especially of depressive symptoms also augment the relationship between NFSI and suicidal behaviours. Therefore, rates of suicide are multiplying quickly among youth and Social media messages and online games promoting suicide, are a preoccupation for parents and clinicians (Dougherty et al., 2009; Muehlenkamp et al., 2007; Brausch et al., 2010; Hamza et al., 2012; Mento et al., 2023).

The differences between Suicide and Nonfatal Self-Injury

Although it is clear that NFSI and suicide attempts are highly associated (Klonsky et al., 2011; Hamza et al., 2012; Wilkinson et al., 2012) there are clinically important differences between NFSI and suicide attempts in psychosocial predictors. In general, NFSI is associated with a lower level of depression, anxiety, stress, suicidal ideation, and higher level of self-appreciation and interpersonal support compared to suicide attempts (Brausch et al., 2010; Whitlock et al., 2011; Andover et al., 2012). Emotional correlates, relief of discomfort, and experience of positive emotional fluctuations are common in NFSI, whereas high levels of depression and guilt are frequently concomitant with suicide attempts (Chapman et al., 2007). NFSI is generally aimed at generating lower abnormal feelings, to discipline oneself, or to express inner anger (Hamza et al., 2012). However, it is still difficult to differentiate among self-injury (SI), suicidal intent, and NFSI.

Blue Whale Challenge (BWC): How social media could be dangerous?

We chose the Blue Whale Challenge for examination as it illustrated a possible danger which received extensive attention. Although it is problematic to understand the scope, factuality, and

impact of other similar trends, as they cannot be easily studied using conventional health data, a study of the BWC allows for a detailed examination of self-injury related content (Sumner et al., 2019). Some studies have investigated the psychological profile of people lured in the BWC. Frequently, negative content appears in the online activity of BWC participants, for example, questions such as why am I the most disliked person? Or how could I get relieved from all the troubles of my life? Chances of falling prey to a suicidal group in social networks are consequently high for such a person, to find out the ways to end his life without inculcating pain. Most of the times the challenges of the game boost the self-regard of the individual, however, if one does not respond to the self-injury practices recommended by the curators, curators may bully the player and threaten to harm their families. So, with more engagement the individual's state of mind becomes so focused on the game that they do not even realize that their real life is at stake as curators manipulate the psychology of the challengers to contend with other challengers, leading to an increased adrenaline rush and finally forcing them to end their lives (Mukhra et al., 2019). Social media have obviously played a role in spreading the word on the BWC which also suggests its utility in enabling quick public health responses to such dangerous online trends. Several interesting findings were reported based on the examination of the online data. Firstly, conventional public health surveillance practices regarding trends and risk factors related to mental health generally do not use real time data. Indeed, official public health surveillance reports are frequently delayed on a scale of 1-2 years, limiting rapid prevention responses. However, health threats may be proceeding for some time before they roll out to attention in the media. Therefore, surveillance of the social media data can potentially aid identification of arising health menaces even months before they become notable for public health agencies (Sumner et al., 2019). Early identification may offer opportunities for health professionals to concentrate more on prevention activities rather than reaction to an already widespread problem. Previous research on social media has indicated that there are robust online communities where the younger generation share and sometimes promote self-harm content (Lewis et al., 2011). Articles on social media use and related suicide risk are presented in Table 1.

Table 1 Use social media and Risk suicide

REFERENCES (Authors, place)	AIMS	SAMPLE SIZE	TYPE MESAUREMENT	RESULTS
Andover, M.S., et al. (2012)	This study aimed to analyze the association between attempted suicide and non-suicidal self-injury (NSSI) among adolescents.	-237 adolescents with treatment-resistant MDD -2,924 high school students -164 treatment-seeking adolescent with MDD.	Longitudinal studies investigating factors that uniquely predict engagement in NSSI or SA.	Results show that teens with a history of suicide attempts and NSSI often have more severe symptoms than teens who have committed just one self-harming behavior.
Khasawneh, A., et al. (2021)	This study aimed at investigating the reason that drive teenagers and young adults to participate in online challenges.	471 participant aged between 13 and 35 years.	-The demographics section -The Cinnamon Challenge entry section -ASL Ice Bucket Challenge entry section.	Participants in both challenges were clearly motivated by public participation, in stark contrast to those who had never participated in the challenge.
Li, H., et al. (2014)	This study is on the role of psychological pain in the risk of suicide.	111 outpatient with major depressive episode, including 28 people with suicidal histories.	-Beck Scale Depression Inventory (BDI) is a 21 item, self-report rating inventory that measures characteristic attitudes and symptoms of depression -Beck Scale for Suicide (BSI) included two subscales: suicidal ideation at one's worst point and current suicidal ideation. -Three-dimensional Psychological Pain Scale (TDPPS) contains three subscales: pain arousal, painful feelings, and pain avoidance.	Increased pain levels during major depressive episodes may be dominant factor in suicide motivation.

Lupariello, F., et al. (2019).	This study is on the effect of internet amid vulnerable adolescents and the problem of self-harming.	5 possible cases of “Blue Whale” of the Hospital Regina Margherita in Turin.		The authors recommend a dedicated multidisciplinary approach to self-harm adolescents, primarily because of the dangers of the Internet for these vulnerable adolescents.
Muehlenkamp, J.J., et al. (2007)	This study aimed at finding out if the common indicators of suicide risk differ between ones with NSSI and ones who have attempted suicide.	540 high school students.	<p>- Reynolds Adolescent Depression Scale (RADSD ; Reynolds, 1987). This 30-item self-report instrument is designed to measure depressive symptoms in adolescents ages 13 to 18</p> <p>-Suicidal Ideation Questionnaire (SIQ; Reynolds, 1988) measure of current suicidal ideation for adolescents</p> <p>-Reasons for Living Inventory for Adolescents (RFL-A; Osman, Downs, Kopper et al., 1998). The RFL-A consists of 32 items and five subscales measuring reasons adolescents give for not committing suicide</p> <p>- Self-Harm Behavior Questionnaire (SHBQ ; Gutierrez, Osman, Barrios et al. 2001). The SHBQ is a self-report measure consisting of forcedchoice and free-response items assessing the degree to which participants have engaged in self-harmful activities.</p>	Results showed that adolescents with NSSI and suicide attempt could be distinguished from those who engaged in NSSI only by suicidal ideation, and degree of depression.

Ortega- Baron, J., et al. (2022).	This study aimed at examining the rapid expansion of viral challenges and validating an instrument to evaluate it.	417 pre-adolescent with age from 10 to 14 years.	Viral Internet Challenges Scale (VICH-S) revealed the existence of two factors: Challenge Satisfaction and Social Motivation.	The complexity, variety, and ephemeral nature of viral challenges make it difficult to quantify the manifestations of this increasingly prevalent online behavior among young people. In this sense VICH-S presents adequate psychometric properties to value this barely explored and growing phenomenon of viral challenge.
Wilkinson, P., et al. (2011)	This study aimed at finding out whether psychosocial and clinical factors in depressed adolescent can lead to NSSI or attempted suicide.	164 adolescents.	Adolescent Depression Antidepressant and Psychotherapy Trial (ADAPT) a trial of the treatment of adolescent major depression.	High suicide rate, non-suicidal self-harm, and poor family functioning on admission are significant independent predictors of suicide attempt.
Durante, J. C., & Lau M. (2022)	This study highlights and describes the impact of the COVID-19 pandemic on the mental health of adolescents.			The pandemic has had severe repercussions on the mental health of adolescents, with an increase in depressive symptoms and suicidal behaviors, and a reduction in access to necessary healthcare services.

The causes

The research has shown that the COVID-19 pandemic has resulted in significant psychopathological sequelae. Due to the stress associated with the pandemic and the subsequent lockdown, there has been an increase in the prevalence of adolescent depression, suicidal ideation, and suicide attempts, with their mental and psychosocial development making them especially susceptible to the isolating restrictions (Durante & Lau, 2022). Key factors contributing to this vulnerability include heightened use of social media, cyberchondria, feelings of increased loneliness, and a decline in social support for adolescents. Moreover, pandemic-related stressors, such as fear of illness or life changes, have exacerbated

these issues. A recent study conducted by Mento et al. (2023) highlighted that affective temperaments, particularly cyclothymic, anxious, irritable, and depressive ones, are directly related to the fear of COVID-19 contagion and excessive internet use. Simultaneously, the causes of the increased rate of suicide among youth remain complex. Research studies have explored new risk factors for suicidal behavior, including exposure to potentially risky contents online. The extent of Internet usage has been linked to suicide rates both on a macro scale (Shah et al., 2010) and on an individual level (Twenge et al., 2018). Although additional research is required to establish any causal associations and identify which online content may be considered dangerous for vulnerable populations, the emergence of online suicide games represents a potential mental health issue that requires further attention (Egge et al., 2010). While early explorations using epidemiological methods have begun to investigate fatalities related to youth games involving self-asphyxiation, the challenges to public health practice and surveillance in addressing these issues persist (Lewis et al., 2011; Sumner et al., 2019). Recognizing the extent of these interconnected challenges is crucial for developing comprehensive strategies to mitigate the extensive physical and mental health risks faced by young individuals.

Conclusion

In conclusion, considering the advances in technologies and access to social media, in addition to the lower age of access to the Internet, younger generations are more than ever exposed to the perils of the digital world. The Covid-19 pandemic has led to an overuse of social networks and an increase in anxious-depressive states specially in the younger population, leading to emotional lability thus the extensive use of compensatory or maladaptive mechanisms, which may include NFSI or joining challenges that may even incite suicide. Proper digital education and a strong help system could be a good prevention strategy to tackle the increasing suicide rate among the younger generation. Although social networks may provide direct or indirect access to potentially dangerous content to vulnerable groups thus represent a risk factor, they could also be used as a protective measures, used to increase awareness, along with prevention workshops at schools and educational activities for families, which often experience a sense of digital inferiority. This approach may not only lead to improvements but also create social network trends focused on prevention/cure and not self-destruction.

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Authors' contribution

LC. assisted with concept, study design and interpretation, manuscript preparation and editing and study supervision. LB C., M S., S C., assisted with the generation of the initial draft of the whole manuscript, manuscript editing and data interpretation. S M.C., CD., H L A., assisted with manuscript editing and study concept. All authors contributed to and have approved the final manuscript.

References

- Andover, M. S., Morris, B. W., Wren, A., & Bruzese, M. E. (2012). The co-occurrence of non-suicidal self-injury and attempted suicide among adolescents: distinguishing risk factors and psychosocial correlates. *Child and adolescent psychiatry and mental health*, 6(1), 1-7. <https://doi.org/10.1186/1753-2000-6-11>
- Benton, T. D., Muhrer, E., Jones, J. D., & Lewis, J. (2021). Dysregulation and suicide in children and adolescents. *Child and Adolescent Psychiatric Clinics*, 30(2), 389-399. DOI: 10.1016/j.chc.2020.10.008.
- Biddle, L., Derges, J., Mars, B., Heron, J., Donovan, J. L., Potokar, J., Piper, M., Wyllie, C., & Gunnell, D. (2016). Suicide and the Internet: Changes in the accessibility of suicide-related information between 2007 and 2014. *Journal of affective disorders*, 190, 370–375 DOI: 10.1016/j.jad.2015.10.028 PMID: 26546772
- Breslin, K., Balaban, J., & Shubkin, C. D. (2020). Adolescent suicide: what can pediatricians do?. *Current opinion in pediatrics*, 32(4), 595-600. DOI: 10.1097/MOP.0000000000000916
- Brausch, A. M., & Gutierrez, P. M. (2010). Differences in non-suicidal self-injury and suicide attempts in adolescents. *Journal of youth and adolescence*, 39(3), 233-242. DOI: [10.1007/s10964-009-9482-0](https://doi.org/10.1007/s10964-009-9482-0)
- Briere, J., & Gil, E. (1998). Self-mutilation in clinical and general population samples: Prevalence, correlates, and functions. *American journal of Orthopsychiatry*, 68(4), 609-620. DOI: [10.1037/h0080369](https://doi.org/10.1037/h0080369)
- Burgess, A., Miller, V., & Moore, S. (2018). Prestige, performance and social pressure in viral challenge memes: Neknomination, the Ice-Bucket Challenge and SmearForSmear as imitative encounters. *Sociology*, 52(5), 1035-1051. <https://doi.org/10.1177/0038038516680312>
- Chapman, A. L., & Dixon-Gordon, K. L. (2007). Emotional antecedents and consequences of deliberate self-harm and suicide attempts. *Suicide and Life-Threatening Behavior*, 37(5), 543-552. DOI: [10.1521/suli.2007.37.5.543](https://doi.org/10.1521/suli.2007.37.5.543)
- Chartier, M. J., Bolton, J. M., Ekuma, O., Mota, N., Hensel, J. M., Nie, Y., & McDougall, C. (2022). Suicidal risk and adverse social outcomes in adulthood associated with child and adolescent mental disorders. *The Canadian Journal of Psychiatry*, 67(7), 512-523. DOI: [10.1177/07067437211055417](https://doi.org/10.1177/07067437211055417)

- Cousien, A., Acquaviva, E., Kernéis, S., Yazdanpanah, Y., & Delorme, R. (2021). Temporal trends in suicide attempts among children in the decade before and during the COVID-19 pandemic in Paris, France. *JAMA network open*, 4(10), e2128611-e2128611. DOI: [10.1001/jamanetworkopen.2021.28611](https://doi.org/10.1001/jamanetworkopen.2021.28611)
- Daine, K., Hawton, K., Singaravelu, V., Stewart, A., Simkin, S., & Montgomery, P. (2013). The power of the web: a systematic review of studies of the influence of the internet on self-harm and suicide in young people. *PloS one*, 8(10), e77555 DOI: 10.1371/journal.pone.0077555
- Dardas, L. A., Price, M. M., Arscott, J., Shahrour, G., & Convoy, S. (2021). Voicing Jordanian adolescents' suicide. *Nursing Research*, 70(1), E1-E10. DOI: [10.1097/NNR.0000000000000476](https://doi.org/10.1097/NNR.0000000000000476)
- Deutz, M. H., Geeraerts, S. B., van Baar, A. L., Deković, M., & Prinzie, P. (2016). The Dysregulation Profile in middle childhood and adolescence across reporters: factor structure, measurement invariance, and links with self-harm and suicidal ideation. *European child & adolescent psychiatry*, 25(4), 431-442. DOI: [10.1007/s00787-015-0745-x](https://doi.org/10.1007/s00787-015-0745-x)
- Dougherty, D. M., Mathias, C. W., Marsh-Richard, D. M., Prevet, K. N., Dawes, M. A., Hatzis, E. S., ... & Nouvion, S. O. (2009). Impulsivity and clinical symptoms among adolescents with non-suicidal self-injury with or without attempted suicide. *Psychiatry research*, 169(1), 22-27. DOI: [10.1016/j.psychres.2008.06.011](https://doi.org/10.1016/j.psychres.2008.06.011)
- Durante, J. C., & Lau, M. (2022). Adolescents, suicide, and the COVID-19 pandemic. *Pediatric annals*, 51(4), e144-e149. DOI: [10.3928/19382359-20220317-02](https://doi.org/10.3928/19382359-20220317-02)
- Egge, M. K., Berkowitz, C. D., Toms, C., & Sathyavagiswaran, L. (2010). The choking game: a cause of unintentional strangulation. *Pediatric emergency care*, 26(3), 206-208. DOI: [10.1097/PEC.0b013e3181d1e3e3](https://doi.org/10.1097/PEC.0b013e3181d1e3e3)
- Ferreira Deslandes, S., Coutinho, T., Ramos de Souza Costa Ferreira, T., & Matassoli Duran Flach, R. (2021). Online challenges among children and adolescents: Self-inflicted harm and social media strategies. *Salud colectiva*, 16, e3264. DOI: [10.18294/sc.2020.3264](https://doi.org/10.18294/sc.2020.3264)
- Gili, M., Castellví, P., Vives, M., de la Torre-Luque, A., Almenara, J., Blasco, M. J., ... & Roca, M. (2019). Mental disorders as risk factors for suicidal behavior in young people: A meta-analysis and systematic review of longitudinal studies. *Journal of affective disorders*, 245, 152-162. DOI: [10.1016/j.jad.2018.10.115](https://doi.org/10.1016/j.jad.2018.10.115)
- Hageman, J. R., & Alcocer Alkureishi, L. (2021). Suicide risk screening and mental health issues; ongoing challenges during the CoViD-19 pandemic. *Pediatric annals*, 50(12), e478-e478. DOI: [10.3928/19382359-20211117-03](https://doi.org/10.3928/19382359-20211117-03)
- Hamza, C. A., Stewart, S. L., & Willoughby, T. (2012). Examining the link between nonsuicidal self-injury and suicidal behavior: A review of the literature and an integrated model. *Clinical psychology review*, 32(6), 482-495. DOI: [10.1016/j.cpr.2012.05.003](https://doi.org/10.1016/j.cpr.2012.05.003)
- Hasking, P., Lewis, S. P., Bloom, E., Brausch, A., Kaess, M., & Robinson, K. (2021). Impact of the COVID-19 pandemic on students at elevated risk of self-injury: The importance of virtual and online resources. *School Psychology International*, 42(1), 57-78. DOI: 10.1177/0143034320974414
- Hawton K, Saunders KEA, O'Connor RC. Self-harm and suicide in adolescents. *Lancet*. 2012;379;2373-82. DOI: [10.1016/S0140-6736\(12\)60322-5](https://doi.org/10.1016/S0140-6736(12)60322-5)
- Khasawneh, A., Madathil, K. C., Zinzow, H., Rosopa, P., Natarajan, G., Achuthan, K., & Narasimhan, M. (2021). Factors contributing to adolescents' and young adults' participation in

- web-based challenges: survey study. *JMIR Pediatrics and Parenting*, 4(1), e24988. DOI: [10.2196/24988](https://doi.org/10.2196/24988)
- Klonsky, E. D. (2011). Non-suicidal self-injury in United States adults: prevalence, sociodemographics, topography and functions. *Psychological medicine*, 41(9), 1981-1986. DOI: [10.1017/S0033291710002497](https://doi.org/10.1017/S0033291710002497)
- Lewis, S. P., Heath, N. L., Sornberger, M. J., & Arbuthnott, A. E. (2012). Helpful or harmful? An examination of viewers' responses to nonsuicidal self-injury videos on YouTube. *Journal of Adolescent Health*, 51(4), 380-385. DOI: [10.1016/j.jadohealth.2012.01.013](https://doi.org/10.1016/j.jadohealth.2012.01.013)
- Lewis, S. P., Heath, N. L., St Denis, J. M., & Noble, R. (2011). The scope of nonsuicidal self-injury on YouTube. *Pediatrics*, 127(3), e552-e557. DOI: [10.1542/peds.2010-2317](https://doi.org/10.1542/peds.2010-2317)
- Lewis, S.P., Heath, N.L., Michal, N.J. et al. Non-suicidal self-injury, youth, and the Internet: What mental health professionals need to know. *Child Adolesc Psychiatry Ment Health* 6, 13 (2012). DOI: 10.1186/1753-2000-6-13
- Li, H., Xie, W., Luo, X., Fu, R., Shi, C., Ying, X., ... & Wang, X. (2014). Clarifying the role of psychological pain in the risks of suicidal ideation and suicidal acts among patients with major depressive episodes. *Suicide and Life-Threatening Behavior*, 44(1), 78-88. DOI: [10.1111/sltb.12056](https://doi.org/10.1111/sltb.12056)
- Lupariello, F., Curti, S. M., Coppo, E., Racalbuto, S. S., & Di Vella, G. (2019). Self-harm risk among adolescents and the phenomenon of the “Blue Whale Challenge”: case series and review of the literature. *Journal of forensic sciences*, 64(2), 638-642. DOI: [10.1111/1556-4029.13880](https://doi.org/10.1111/1556-4029.13880)
- Marchant, A., Hawton, K., Stewart, A., Montgomery, P., Singaravelu, V., Lloyd, K., Purdy, N., Daine, K., & John, A. (2017). A systematic review of the relationship between internet use, self-harm and suicidal behaviour in young people: The good, the bad and the unknown. *PLoS one*, 12(8), e0181722. DOI: 10.1371/journal.pone.0181722
- McMahon, E. M., Keeley, H., Cannon, M., Arensman, E., Perry, I. J., Clarke, M., ... & Corcoran, P. (2014). The iceberg of suicide and self-harm in Irish adolescents: a population-based study. *Social psychiatry and psychiatric epidemiology*, 49(12), 1929-1935. DOI: [10.1007/s00127-014-0907-z](https://doi.org/10.1007/s00127-014-0907-z)
- Mento, C., Silvestri, M. C., Muscatello, M. R. A., Rizzo, A., Celebre, L., Bruno, A., & Zoccali, A. R. (2020). Psychological pain and risk of suicide in adolescence. *International journal of adolescent medicine and health*. DOI: [10.1515/ijamh-2019-0270](https://doi.org/10.1515/ijamh-2019-0270)
- Mento, C., Silvestri, M. C., Lombardo, C., Neri, L. G., Campolo, M. G., & Pira, F. (2023). Who Believes in Fake News: A Study on the Relationship between Affective Temperament, Cyberchondria and Problematic Use of the Internet during the COVID-19 Pandemic. *OBM Neurobiology*, 7(1), 1-16. DOI:10.21926/obm.neurobiol.2301151.
- Mercado, M. C., Holland, K., Leemis, R. W., Stone, D. M., & Wang, J. (2017). Trends in emergency department visits for nonfatal self-inflicted injuries among youth aged 10 to 24 years in the United States, 2001-2015. *Jama*, 318(19), 1931-1933. DOI: [10.1001/jama.2017.13317](https://doi.org/10.1001/jama.2017.13317)
- Messina, E. S., & Iwasaki, Y. (2011). Internet use and self-injurious behaviors among adolescents and young adults: an interdisciplinary literature review and implications for health professionals. *Cyberpsychology, behavior and social networking*, 14(3), 161-168. DOI: 10.1089/cyber.2010.0025
- Muehlenkamp, J. J., & Gutierrez, P. M. (2007). Risk for suicide attempts among adolescents who engage in non-suicidal self-injury. *Archives of suicide research*, 11(1), 69-82. DOI:

[10.1080/13811110600992902](https://doi.org/10.1080/13811110600992902)

- Mukhra, R., Baryah, N., Krishan, K., & Kanchan, T. (2019). 'Blue Whale Challenge': A game or crime?. *Science and engineering ethics*, 25(1), 285-291. DOI: [10.1007/s11948-017-0004-2](https://doi.org/10.1007/s11948-017-0004-2)
- Nock, M. K., Joiner Jr, T. E., Gordon, K. H., Lloyd-Richardson, E., & Prinstein, M. J. (2006). Non-suicidal self-injury among adolescents: Diagnostic correlates and relation to suicide attempts. *Psychiatry research*, 144(1), 65-72. DOI: [10.1016/j.psychres.2006.05.010](https://doi.org/10.1016/j.psychres.2006.05.010)
- Ortega-Barón, J., Machimbarrena, J. M., Montiel, I., & González-Cabrera, J. (2022). Viral internet challenges scale in preadolescents: An exploratory study. *Current Psychology*, 1-11. DOI: [10.1007/s12144-021-02692-6](https://doi.org/10.1007/s12144-021-02692-6)
- Ougrin, D., Wong, B.Hc., Vaezinejad, M. *et al.* Pandemic-related emergency psychiatric presentations for self-harm of children and adolescents in 10 countries (PREP-kids): a retrospective international cohort study. *Eur Child Adolesc Psychiatry* 31, 1–13 (2022). DOI: [10.1007/s00787-021-01741-6](https://doi.org/10.1007/s00787-021-01741-6)
- Pompili, M., Goracci, A., Giordano, G., Erbuto, D., Girardi, P., Klonsky, E. D., & Baldessarini, R. J. (2015). Relationship of non-suicidal self-injury and suicide attempt: a psychopathological perspective. *J Psychopathol*, 21(4), 348-353.
- Shah, A. (2010). The relationship between general population suicide rates and the internet: a cross-national study. *Suicide and Life-Threatening Behavior*, 40(2), 146-150. DOI: [10.1521/suli.2010.40.2.146](https://doi.org/10.1521/suli.2010.40.2.146)
- Twenge, J. M., Joiner, T. E., Rogers, M. L., & Martin, G. N. (2018). Increases in depressive symptoms, suicide-related outcomes, and suicide rates among US adolescents after 2010 and links to increased new media screen time. *Clinical Psychological Science*, 6(1), 3-17. <https://doi.org/10.1177/2167702617723376>
- Villani, D., Florio, E., Sorgente, A., Castelli, I., Riva, G., Marchetti, A., & Massaro, D. (2019). Adolescents' beliefs about peers' engagement in an online self-harm challenge: exploring the role of individual characteristics through a latent class analysis. *Cyberpsychology, Behavior, and Social Networking*, 22(11), 684-691. DOI: [10.1089/cyber.2019.0002](https://doi.org/10.1089/cyber.2019.0002)
- Whitlock, J., Muehlenkamp, J., Purington, A., Eckenrode, J., Barreira, P., Baral Abrams, G., ... & Knox, K. (2011). Nonsuicidal self-injury in a college population: General trends and sex differences. *Journal of American College Health*, 59(8), 691-698. DOI: [10.1080/07448481.2010.529626](https://doi.org/10.1080/07448481.2010.529626)
- Wilkinson, P., Kelvin, R., Roberts, C., Dubicka, B., & Goodyer, I. (2011). Clinical and psychosocial predictors of suicide attempts and nonsuicidal self-injury in the Adolescent Depression Antidepressants and Psychotherapy Trial (ADAPT). *American journal of psychiatry*, 168(5), 495-501. DOI: [10.1176/appi.ajp.2010.10050718](https://doi.org/10.1176/appi.ajp.2010.10050718)
- Xie, W., Li, H., Luo, X., Fu, R., Ying, X., Wang, N., ... & Shi, C. (2014). Anhedonia and pain avoidance in the suicidal mind: behavioral evidence for motivational manifestations of suicidal ideation in patients with major depressive disorder. *Journal of Clinical Psychology*, 70(7), 681-692. DOI: [10.1002/jclp.22055](https://doi.org/10.1002/jclp.22055)