THE HARMFUL IMPACT OF SUICIDE AND SELF-HARM CONTENT ONLINE: A REVIEW OF THE LITERATURE

Niall McTernan

Fenella Ryan

National Suicide Research Foundation, Ireland

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Connecting for Life

Contents

Introduction

This review relates to Connecting for Life Action 1.4.1 – "engage with online platforms to encourage best practice in reporting around suicidal behaviour, so as to encourage a safer online environment in this area" (see Figure 1). The Department of Communications, Climate Action and Environment have lead responsibility for this action with the National Office for Suicide Prevention (NOSP) as a supporting partner. The National Suicide Research Foundation (NSRF) is a Connecting for Life funded agency and is recognised as a World Health Organisation (WHO) Collaborating Centre for Surveillance and Research in Suicide Prevention. This review will inform the position of the NOSP in relation to this action and extend the knowledge and understanding of the types of harmful suicide or self-harm content online in Ireland.

The primary aims of this review are as follows:

- To identify, review and summarise the literature and evidence on the impact of harmful suicide or self-harm content online.
- To propose clearly defined descriptions of categories of online material that are considered to be harmful in relation to suicide and self-harm.

In line with these aims, this report is segmented into ten main sections, categorised by the following types of online content, several of which have been previously classified (Marchant et al. 2017):

1) Online information sources (websites used to inform method)
2) Search engines
3) Social networks
    - Facilitate access to potentially harmful information
    - Facilitate contagion
    - Normalising self-harm and suicide
    - Increased risk following celebrity suicide
    - Facilitate cyberbullying
    - Suicide notes
4) Online imagery and videos
5) Online forums/message boards
6) Pro-suicide and self-harm sites
7) Online suicide 'games'
8) The 'Darknet'
9) Livestream suicide / cybersuicide
10) Online suicide 'pacts'

1. To improve the nation's understanding of, and attitudes to, suicidal behaviour, mental health and wellbeing			
Objective	**Action**	**Lead**	**Key Partners**
1.3 Reduce stigmatising attitudes to mental health and suicidal behaviour at population level and within priority groups.	1.3.1 Deliver campaigns that reduce stigma to those with mental health difficulties and suicidal behaviour in the whole population and self-stigma among priority groups.	NOSP	HSE MH, Youth sector, Non-statutory partners
1.4 Engage and work collaboratively with the media in relation to media guidelines, tools and training programmes to improve the reporting of suicidal behaviour within broadcast, print and online media.	1.4.1 Engage with online platforms to encourage best practice in reporting around suicidal behaviour, so as to encourage a safer online environment in this area.	DCENR	NOSP, Non-statutory partners
	1.4.2 Broadcasting Authority of Ireland will apply and monitor its Code of Programme Standards, including Principle 3 - Protection from Harm, which references self-harm and suicide, so as to ensure responsible coverage around these issues in the broadcast media.	DCENR	Broadcasting Authority of Ireland
	1.4.3 The Press Council will amend its code of practice to include a principle on responsible reporting of suicide.	Press Council of Ireland	
	1.4.4 Monitor media reporting of suicide, and engage with the media in relation to adherence to guidelines on media reporting.	NOSP	

Figure 1: Connecting for Life Strategic Goal 1, Action 1.4

Methodology

An extensive review of the academic literature was conducted using MEDLINE, PsycINFO, CINAHL and EBSCO databases. Journal articles (including original research, review articles, short reports and letters) were included in the search, in addition to published reports and policy documents. A list of key search terms (n=67) (see Appendix 1) and inclusion/exclusion criteria was agreed by the authors to retrieve relevant papers.

Key search strings included:

("Suicide"[Title/Abstract] OR "Suicidal behaviour"[Title/Abstract] OR "Attempted suicide"[Title/Abstract] OR "Suicidal ideation"[Title/Abstract] OR "Suicide planning"[Title/Abstract] OR "Pro suicide"[Title/Abstract] OR "Suicide pact"[Title/Abstract] OR "Self-harm"[Title/Abstract] OR "Self-injury"[Title/Abstract] AND "social media"[Title/Abstract] OR "online social network"[Title/Abstract] OR "Hashtag"[Title/Abstract]] OR "Internet"[Title/Abstract] OR "World wide web"[Title/Abstract] OR "Online platform"[Title/Abstract] OR "Online forum"[Title/Abstract] OR "Online video"[Title/Abstract] OR "Online image"[Title/Abstract] OR "Blog"[Title/Abstract] OR "Chatroom"[Title/Abstract] OR "Online search engine"[Title/Abstract] OR "Live stream"[Title/Abstract]

The inclusion/exclusion criteria were*:*

Inclusion criteria:

- Systematic reviews on suicide, self-harm and social media/internet use.
- Articles on use of social media and the internet; and suicidal behaviour among the general population and different cohorts.
- Articles eliciting the risks of and harmful impacts of suicide and self-harm content online e.g. suicide games, online broadcasts, pro suicide and self-harm sites, suicide pacts.
- Articles analysing trends on specific platforms (Images, hashtags etc).
- Articles on social media and internet use, with a focus on suicide and cyberbullying.
- Articles on suicidal behaviour and internet addiction.
- Studies on changes in suicide related internet activity over time and after celebrity suicide.
- Articles on suicide related search terms/method attainment.

Exclusion criteria:

- Articles based on interventions (internet based), screening for suicide risk, predicting suicidal behaviour, monitoring online content etc.
- Articles on media reporting.
- Studies on attitudes towards online broadcasts, self-harm content online etc.
- Studies focussing on depression and other mental health problems.
- Articles analysing film and television, e.g. 13 Reasons Why.

On May 25th 2020, 2,431 articles were identified through the database searches. 185 records were subsequently selected for further examination based on the inclusion/exclusion criteria. When duplicates were removed 182 titles and abstracts were screened by NMcT and FR. A further 76 articles were removed having been identified as not relevant or inaccessible, resulting in 106 articles included for review at this stage.

Additional articles, reports, policy documents and reviews relating to harmful online content and suicide and self-harm, that were published between May 25thand November 30th, 2020, were added as discovered during the writing stage (n=4). In total 110 articles were included in November 2020.

A follow up search was conducted on August 1st, 2023, identifying 340 articles through database searches. 50 of these were selected for examination based on the inclusion/exclusion criteria. 10 articles were removed having been identified as not relevant or inaccessible, resulting in a further 40 articles being included in the review.

In total 150 articles were included in the August 2023 update.

Authors

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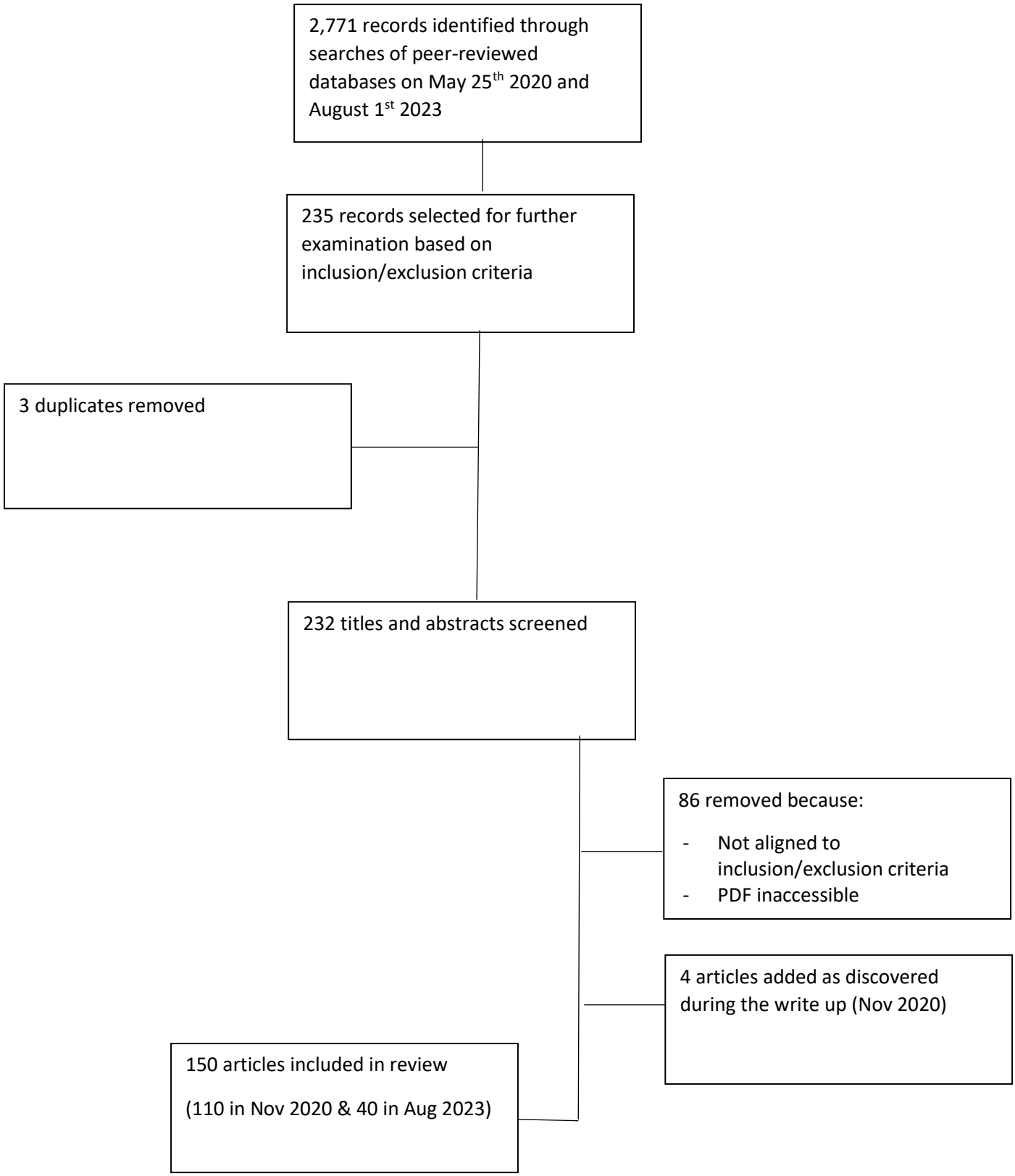

Figure 2: PRISMA flow diagram summarising search used to identify published literature

Harmful impact of exposure to suicide and self-harm online

Literature suggests that there is inadequate understanding of the different forms of self-harm and suicide online, including a lack of definition and taxonomy of self-harm and suicide content on social media (Scherr, 2022), with a paucity of content definitively classifiable as explicitly harmful or helpful (Brennan et al. 2022).

Nevertheless, research indicates that the internet and social media are double edged swords and can provide both benefits and challenges (Robinson et al. 2016; Fu et al. 2013). While the benefits of internet use are clear, there is significant risk of harm related to online behaviour such as reinforcement, stigmatization, normalisation, triggering and contagion, in addition to hindering professional help-seeking and the depiction of methods of suicidal behaviour (Marchant et al. 2017; Lewis & Seko 2016 ; Daine et al. 2013 ; Alao et al. 2006).

For the purpose of this review, the authors will focus on the harmful aspects of online activity in relation to suicidal behaviour and self-harm, and seek to establish categories of online material which are considered harmful, according to the evidence base.

1. Online information sources (websites used to inform method)

Much research has focused on the role of the internet in facilitating and informing method choice for those who are considering taking their own life. Information regarding methods of self-harm and suicide is considered as harmful content as it is widely accepted that knowledge of methods can lead to imitation (Lee et al. 2014 ; Chang el al. 2010).

The internet is frequently used to obtain information about methods of suicide and self-harm (Robert et al. 2015). This appears to be more common in English language websites (Cheng et al. 2011). For example, several respondents to a **UK hospital-based qualitative study** admitted to intentionally seeking information about methods when planning their attempt — predominantly from the internet (Biddle et al. 2012).

An earlier study by Biddle et al., in 2008, highlighted the ease at which detailed technical information about methods of suicide could be obtained, not just from suicide sites, but also from information sites such as **Wikipedia.** This accessibility of online suicide-related information is increasing. Between 2007 and 2014, Biddle et al., 2016 identified a **rise in blogs and discussion forums** related to suicide. During their search, they also found an increase in search results linking to general information sites

– specifically factual sites that outline and appraise suicide methods and an increase in dedicated suicide sites. Concerningly, over half of their overall search results contained information about **new high-lethality methods** (Biddle et al. 2016).

Another English study of methods used by individuals who died by suicide and the role of the internet, found evidence of a direct internet influence in 1.5% (n=9) of the 593 suicides examined. In seven (77.8%) of the cases analysed, there was evidence that individuals had searched the internet for the method used. Five of the nine cases (55.6%) had used uncommon highly lethal methods, in comparison with 1.7% of all suicides. The authors concluded that **easy access to information about suicide methods and pro-suicide websites on the internet may influence a small but significant number of suicides** (Gunnell et al. 2012). Further discussion on methods is included in the next sub-section.

2. Search engines

Online search engines are the gateway to websites and online information. Several studies identified through this review explored associations between information seeking via search engines and actual suicide rates (Arendt, 2018 ; Bruckner et al. 2014 ; Sueki et al. 2011). Conflicting results within the existing literature make it difficult to draw definitive conclusions.

A German-led study investigated the correlation between suicide-related search volume and suicide rates in 50 countries across five continents and found a **positive association between suicide rates and search volume** (Arendt, 2018). Similarly, a Canadian study on the statistical association between the search volume of suicide-related terms on Google and official deaths by suicide found a positive concurrent relationship between search propensity and the number of actual suicides (Chandler, 2018).

A UK study investigating exposure to information about suicide and self-harm on the internet among a cohort of **young adults** found that suicide and self-harm-related internet use was common for those who had engaged in self-harm with suicidal intent, and that this use was strongly correlated with the presence of suicidal thoughts/plans, and history of self-harm. Of note, the majority of individuals (81%) had also visited sites containing helpful information to mitigate potential suicidal behaviour (Mars et al. 2015). A Korean study also found significant correlation between **suicide attempts and search term volumes**, specifically the terms "suicide," "self-injury," and "depression" (Son et al. 2023).

However, a time-series analysis of Google searches for suicide and the risk of completed suicide in England and Wales between 2004–2010 found **no relationship between "*suicide*" or "*suicide* and *methods*" searches and suicide incidence** (Bruckner et al. 2014). A study of Google data and official suicide figures in Japan using the same terms had a similar outcome and found that suicide-related search activity was not directly linked to rising rates of suicide (Sueki et al. 2011). A study in South Korea identified a **weak association** between suicides and internet search volumes related to suicide/self-harm among adolescents (Choi et al. 2023), while a Polish study observed a steady fall in Google relative search volume of "suicide" between 2004-2014, despite a significant increase in the rate of suicide (Waszak et al. 2018).

These studies did not just focus on the volume of search results and the association with actual suicides, but also on the search terms themselves. A Canadian study concluded that non-suicidal self-injury–related search terms are regularly searched for across the world and results commonly return noncredible and low-quality information that may proliferate established self-harm myths (Lewis et al. 2014). It also appears that people **may seek information about new or uncommon methods** of suicide via search engines. For example, in Germany, using data from Google Trends to ascertain if suicides via new and emerging methods were associated with internet searches, a significant association was found between internet searches for carbon monoxide poisoning among both genders, independent of age (Paul et al. 2017).

In addition to this, a Chinese study on the association between suicide involving charcoal burning and Google Trends found that every 10% increase in google searches was associated with a 4.3 % increase in charcoal burning suicide incidence in the same week, and a 3.8 % increase in the following week (Chang et al. 2015).

In contrast, Gunnell et al., 2015, found **no evidence of rises in internet searching about suicide using helium** between 2004 and 2014 in their study on the accessibility of information about helium as a method of suicide on the internet. Nevertheless, the authors note that the availability of online information about this method may be a contributing factor in future rises in helium suicides (Gunnell et al. 2015).

It is important to note that Til & Niederkrotenthaler, 2014 found that protective websites offset harmful website characteristics by approximately 2:1 when websites for suicide methods and help seeking in Austria and the United States were examined. However, websites retrieved with method-related search terms, for example 'cutting' and 'hanging', contained more harmful and fewer

protective characteristics in comparison with the term 'suicide'. **This indicates that the specific terms entered into a search engine may be meaningful** (Til & Niederkrotenthaler, 2014). Correspondingly, a Chinese study identified that phrases such as *'ways to kill yourself'* and *'painless suicide'* created increased harmful content in comparison to terminology such as *'suicide'* (Chen et al. 2017). Bojanic and Gorski, 2021, furthermore, identified two suicide prevention search terms, both translating to 'suicide', and one suicide risk term (how to kill yourself), where an increase in searches preceded an increase in suicides.

3. Social networks

Within the literature, many terms describing 'social network' were found, for example 'social media', 'social platform' and 'social channel'. Within this review, the authors use 'social network' to encompass all of these terms.

Over the last two decades, a large volume of studies have focused on the relationship between social networks and suicidal behaviour. The harmful association between social networks and self-harm and suicidal behaviour is well documented**.** Systematic reviews have identified that **harmful aspects of social networks include normalising self-harming behaviour; the inclusion of dialogue around motivation and triggers for self-harm, increased suicidal ideation or plans among users; and accessible depictions of self-harm acts** (Dyson et al. 2016). In addition**,** challenges include managing user behaviour and difficulties assessing risk; and problems relating to privacy and confidentiality (Robinson et al. 2016; Colombo et al. 2016).

For adolescents, greater time spent on social networks has been associated with increased self-harm behaviour and suicidal ideation, linked to users receiving damaging messages promoting self-harm, copying self-harming behaviour of others, and emulating self-harm practices from shared videos. Time expended on social networks has also been found to lead to amplified psychological distress, an unfulfilled need for mental health support, adverse self-rated mental health, and increased suicidal ideation (Muslic et al. 2023; Winstone et al. 2022; Gámez-Guadix et al. 2022; Sumner et al. 2021; Shafi et al. 2020 ; Memon et al. 2018 ; Berryman et al. 2017), particularly among girls (Luby & Kertz, 2019) and among sexual and gender minority youth (Nesi et al. 2021). Use may also be an indicator of impulsivity (Shafi et al. 2021). **A UK study** found that although suicide-related online experience is a common, and likely underestimated, precursor to suicide in young people, its contributing role remains **unclear** (Rodway et al. 2022).

Survey data of 5,593 middle and high school students (12-17 years old) **in the U.S** noted several statistically significant associations related to engaging in digital self-harm, 'a form of self-aggression that involves anonymously posting hurtful and sometimes verbally abusive remarks about one's self online' (Psych Central, 2018), including sexual orientation, history of traditional bullying and cyberbullying, drug use, experience of adolescent deviance, insufficient sleep and depression (Semenza et al. 2022 ; Patchin & Hinduja, 2017). In a recent follow up study, engagement in digital self-harm was correlated with a five- to sevenfold increase in thoughts of suicide and a nine- to 15-fold increase in suicide attempts (Patchin et al. 2023). **In Ireland**, a prominent view emanating from an online survey of teenagers centred around the weight of expectation and pressure that social media places on teenagers (Chambers et al. 2018).

Although time spent online may facilitate suicidal behaviour for some adolescents, it is important to note that other research suggests that there are **null, mixed or very small associations between time spent online and mental health problems for most adolescents** (Orben & Przybylski, 2019 ; Best et al. 2014). These research findings suggest that it is more likely that what teens post and view online is linked to their risk for depression and self-harm than social networks, particularly for groups of vulnerable adolescents (George, 2019). A recent study of suicide rates among 15-24-year olds in eleven high-income countries with populations of more than twenty million from 2000-2017 found minor evidence of an association between daily social media use and youth suicide trends (Padmanathan et al. 2020). A UK study also found that infrequent use of social media may reflect social anhedonia or withdrawal, which may increase risk of severe suicidal ideation or delay initial treatment (Hamilton et al. 2021).

A case series review of suicides associated with social media use in South Tyneside, England, where evidence from social media was cited at inquest found that the deceased were more likely to be over 45, to have been single and in employment but less likely to have been diagnosed with mental illness, than those in which social media evidence was not cited. The authors note that public health campaigns around safe use of social media may need to be considered among **middle aged people**, in addition to the identified need among younger generations (Howard & Surtees, 2016).

- *Facilitate access to potentially harmful information*

By viewing and reading material on social networks, normalising of self-harm may take place as well as providing access to suicide content and violent images (Daine et al. 2013). Non-Suicidal Self Injury (NSSI) behaviours are becoming common across social networks (Brown et al.2018). Instagram is explicitly noted within several studies identified in this review, with Moreno et al., 2016 concluding

that **content aligned to self-harm is prevalent on Instagram and often obscured by unclear or secret hashtags and that content advisory warnings were not dependable**. The term *'#MySecretFamily'* was commonly used and only one-third of the relevant hashtags generated content advisory warnings. Further 'secret' hashtags included *'#blithe', '#cat'*, *'#selfinjuryy'* and *'#selfharn'* (Fulcher et al. 2020 ; Moreno et al. 2016).

Similarly, a German study using content analysis to examine a suicide-related hashtag on Instagram noted with caution that users may be exposed to 'purposefully inserted suicide-related subliminal messages (i.e., exposure to content without the user's conscious awareness)' (Arendt et al. 2021; Arendt et al. 2019).

A study of suicide-related internet use among suicidal young people in the UK identified two predominant drivers of suicide-related internet use among suicidal young people: to connect with others and to seek information. The authors note that both concepts had positive and negative effects and suggest that sites containing information about suicide methods and their lethality can be perceived as helpful or harmful, contingent moderately on "masculine" or "feminine" mode of expressions (Bell et al. 2018).

Brown et al., 2020 conducted semi-structured interviews with fifty-nine young people to explore their motivations behind posting NSSI content online and investigate the effect sharing this content had on young people. Around a third of participants reported that online NSSI content triggered self-harming behaviour. In early 2019, instagram introduced measures to ban NSSI hashtags from their platform[1]. While this is a step towards preventing social contagion, merely blocking hashtags is not a solution according to Brown et al., 2020, for example, if #self-injury is blocked #self-injuryyy can be created. Therefore, content would have to be manually checked by commercial companies, which poses a tremendous workload and may not be feasible.

- *Facilitate contagion*

Considerable attention has been given to the possible role of social networks and the internet in contributing to self-harm and suicide contagion, predominantly in adolescence and youth (Becker et al. 2004).

A study of associations between social media and suicidal behaviours during a suicide cluster involving young people in the U.S found that engagement with suicide cluster related social media was

[1] https://www.theguardian.com/technology/2019/feb/08/instagram-heads-off-regulations-with-ban-on-self-harm-imagesl.

associated with increased suicide ideation and suicide attempts during a suicide cluster in Ohio (Swedo et al. 2020).

A Canadian study on the association between Twitter content and suicide indicated that tweets describing suicide deaths and/or sensationalized news stories may be harmful while those that present suicide as undesirable, tragic and/or preventable may be helpful, echoing traditional news media reporting (Sinyor et al. 2021). Kline et al., 2023 found that adolescents expressing severe suicide thoughts reported social alienation and learned capacity for suicidal acts, associated with using social media.

Moreover, a Chinese study of responses to a self-presented suicide attempt on social media concluded that social media **may facilitate contagion and clusters by spreading suicidal thoughts and acts, however, it may also have a positive role in supporting people at risk for suicide** (Fu et al. 2013). Brown et al., 2020 concluded that many participants followed pages with NSSI content first, before starting to post their own NSSI pictures, which may demonstrate social contagion.

'Memorial' pages may also facilitate contagion and copycat behaviour. An examination of the relationship between an adolescent suicide cluster and the role of electronic communications in New Zealand found that several cases were not linked to a single school, instead several were connected by social media sites, including sites created in memory of previous adolescents who had taken their own lives. The authors remark that social media sites **assisted the rapid spread of information about the deaths in the community and made the identification and management of a possible cluster more difficult** (Robertson et al. 2012).

However, in contrast, a study of presentations to emergency departments in Ontario, Canada found that an increase in suicides from October 2012 to December 2013 among 11-17-year olds **could not be attributed to a highly publicised adolescent suicide**. The authors concluded that suicide-related internet content was not associated with the increase in ED visits for suicidal behaviour (Poonai et al. 2018).

- *Normalising self-harm and suicide*

A **UK qualitative study** of 362 messages related to self-harm on Twitter identified five central themes: the influence of celebrities, self-harm should be taken seriously, support for and from others, eating disorders and self-harm, and videos and personal stories. The authors conclude that while Twitter may **act as a source of support, the sense of companionship and community generated may facilitate the normalisation of self-harm** (Hilton, 2017). A systematic review of social media use to discuss and view

deliberate self-Harm acts identified similar outcomes regarding normalising self-harming behaviour (Dyson et al. 2016).

Yet, a UK study of responses to tweeting about self-harm and suicide among young people who identify as transgender found no replies that were dismissive or promoted self-injurious behavior (Simms, 2020).

- *Increased risk following celebrity suicide*

Suicide deaths of **celebrities of high prominence can lead to considerable national increases in internet search volumes for suicide-related terms** (Ortiz et al. 2018) and the content of posts may show considerable changes that suggest increased suicidal ideation (Kumar et al. 2015). An examination of Twitter posts and deaths by suicide in Japan, identified an increase in suicides only when suicide deaths provoked a large response from users. In addition, deaths of younger celebrities generated a higher number of posts on Twitter. The authors suggest that it is necessary to examine social as well as traditional news media when examining the impact of media reports on actual suicides (Ueda et al. 2017).

- *Facilitate cyberbullying*

A systematic review examining the association between self-harm, suicidal behaviour and cyberbullying in children and young people, published in 2018, found that **victims of cyberbullying are at a greater risk of both self-harm and suicidal behaviours than nonvictims.** The authors state that to a lesser degree, those who engage in cyberbullying are at risk of suicidal behaviours and suicidal ideation when compared with those who do not (John et al. 2018).

Ossa et al., 2023 found that cyber-only bullying appears to be related to specific mental health issues beyond those associated with school-only bullying, while Hellstand et al. 2021 found that **cyberbullying is a risk factor for self-harm and suicide in patients with mental health problems**. Two chinese studies of adolescents subjected to traditional and cyber bullying and subsequent suicidal ideation, self-harm and suicide attempts concluded that adolescents who were victims of both traditional and cyberbullying had greater risks of suicidal ideation only, suicidal ideation plus self-harm and suicide attempts in the short-term (Perret et al. 2020 ; Peng et al. 2019). A more recent study in China found that sexting, cyberbullying victimization, cyberbullying perpetration, and Internet Gaming Disorder were independently correlated with increased self-harm risk among adolescents (Lan et al. 2022).

Moreover, a UK study on adolescents' viewing of suicide-related web content and psychological problems, and the association with cyberbullying found an association independent of psychological problems (Gorzig, 2016).

- *Suicide notes*

When analysing suicide notes on social media, researchers in Switzerland concluded that evidence of copycat suicides induced by suicide notes on social networking sites is **unclear**. However, notes may facilitate immediate intervention from other users (Ruder et al. 2011).

4. Online imagery and videos

In addition to text-based information sources, images and videos posted on the internet have been identified as potentially harmful (Brown et al. 2018 ; Miguel et al. 2017). A recent systematic review found that **seeing self-harm images online may have both harmful and protective effects**, but harmful effects were more prevalent in the studies (Susi et al. 2023). Marchant et al., 2021, in addition, found in their systematic review that that there has been an **increase in harmful graphic self-harm imagery over time** with an absence of moderation, anonymity, and pictures easy to find using the search function. The authors noted a range of reactions and motivations for sharing or viewing images of self-harm, including empathy, a sense of unity, and the use of images to give or receive support, as well as potentially harmful rationale including suggesting new methods, normalization, and exacerbation of self-harm.

A recent scoping review also found that there was a connection between time scrolling on Instagram and self-harm; including **normalisation; contagion, and a sense of belonging** (Moss et al. 2022). A content analysis of Instagram pictures depicting wounds associated with self-cutting in Germany found that depictions with higher wound grades and those illustrating multiple methods of self-harm returned a higher number of comments / responses from viewers. The authors conclude that images involving self-harm by cutting are regularly posted on Instagram and that social reinforcement or contagion may contribute to the inclusion of more severe pictures (Brown et al. 2018). Similarly, a U.S study of 1155 public posts on popular social media found that approximately 60% of sampled posts portrayed graphic content, and almost half included negative self-evaluation. The authors suggest that Instagram posts displayed the highest percentage of graphic content and adverse self-evaluations, while Twitter facilitated the smallest proportion for both. They conclude that there is a lack of help seeking resources for at risk individuals looking for deliberate self-injurious cutting content (Miguel et al. 2017). Arendt et al., 2021, moreover, found that **subliminal messages** on Instagram are ethically

highly problematic. A US study analysing posts by Pinterest users found that **suicidal ideation content was more prevalent in visuals than in accompanying text**. While overall posts featured more helpful than harmful content, graphic details of suicides and suicide attempts were still prevalent (Guidry et al. 2021).

A qualitative study of how young people understand and use online images of self-harm in Wales reported that the **internet has empowered the normalisation of young people's self-harm and that pictures incite a physical reaction and stimulate behavioural enactment.** The authors identify Tumblr as the preferred platform for participants in their study and state that watching online images is important for many young people who engage in self-harm, as part of 'ritualistic practice' (Jacob et al. 2017).

However, a visual content and thematic analysis of 602 images on Twitter, Instagram and Tumblr in the UK found that **none of the images studied explicitly promoted self-harm or suicide and no pictures could be interpreted as sensationalising self-harm**. The authors identified four themes: communicating anguish, addiction and recovery, gender and the female body, and identity and belonging (Shannahan et al. 2019). It must be noted, nevertheless, that even if the images didn't explicitly promote suicidal behaviour or sensationalise self-harm they may still be triggering for vulnerable individuals.

Research related to internet-based videos is sparse but one Canadian study of non-suicidal self-injury content on YouTube found that explicit imagery related to self-injury was common. The findings indicate that 90% of videos without characters had pictures related to self-harm, while 28% of videos including individuals had portrayed an act self-harm. Cutting was the most common method and over half of the videos analysed (58%) did not include warnings about harmful content. **The authors conclude that non-suicidal self-injury videos on YouTube may encourage the normalisation of non-suicidal self-injury and may enhance the behaviour through regular viewing of graphic videos** (Lewis et al. 2011).

A Canadian study examining viewers' responses to self-harm content on YouTube found that the most common comments were related to self-disclosure, whereby individuals shared their own NSSI experiences. Within these, positive recovery statements were infrequent, and the majority did not mention recovery at all. The authors advocate that **onlookers' responses to videos may maintain the behaviour and seldom encourage or reference recovery** (Lewis et al. 2012).

However, a recent US study of 413 videos about teenage suicide on YouTube determined that almost half (48.6%) were educational and nearly a third (29.3%) covered awareness/prevention of teenage suicide. The authors conclude that YouTube **may provide an opportunity to engage with teenagers and to promote positive mental health** (Dagar & Falcone, 2020). Lewis et al., 2018, furthermore noted that viewing hopeful online messages on YouTube led to an improvement 'in positive attitudes towards recovery and recovery-oriented subjective norms' (Lewis et al. 2018).

5. Online forums / message boards

Forums or message boards permit anonymous discussions with others about a wide range of topics, including discussions about mental health problems. Studies of such conversations indicate that they may encourage vulnerable persons to attempt suicide (Becker & Schmidt, 2004; Becker et al. 2004).

Within a national sample of American adolescents and young adults, Dunlop et al., 2011 examined the potential influence of various online platforms on young people's exposure to stories about individuals who took their own life. Primary sources of content related to suicide included family, friends and newspapers, however, the authors also identified significant exposure to online stories. While capacity for positive effects related to social networking were identified, increased suicidal ideation was strongly correlated with engaging in online forum discussion. Dunlop et al. 2011 conclude that **rises in suicidal ideation cannot be attributed to use of online forums but their use is associated with rises in such ideation**. This stands in contrast to use of social networking sites, which despite their ability to transmit information about suicidal behaviour, do not appear to be associated with increases in ideation (Dunlop et al. 2011).

Similarly, a study of more than 400 self-injury message boards in the US found that while online communications offer important social support for otherwise isolated adolescents, **they may also normalise and promote self-injurious behaviour and expose new potentially lethal behaviours to those with a history of self-injury and those exploring identity options** (Whitlock et al. 2006).

6. Pro-suicide and self-harm sites

Websites promoting suicidal behaviour have been the focus of numerous studies over the last decade. In 2006, Australia became the first country to prohibit pro suicide and self-harm websites (Pirkis et al. 2009). New Zealand and the United Kingdom have followed suit in either passing or recently amending legislation to hold individuals who assist, encourage, aid, provide guidance or procure a suicide or suicide attempt online accountable (Phillips et al. 2019 ; Cheng 2011). There have been calls for others to follow suit, however it remains a complex issue. An in-depth study of websites promoting self-harm

in the UK found that the majority of users visited such sites at least twice per week, and most participants used the sites to find information or participate in forum discussion. Constructive effects of website use such as acquiring help and support, reduced isolation, and less frequent self-harming behaviours were reported by a substantial number of participants. **Smaller but significant numbers reported adverse effects including exacerbated self-harm, triggering of behaviour, and further negative physical and psychological effects** (Harris & Roberts, 2013). A comparable study in the Netherlands examining the benefits and potential harmful effects of an online suicide prevention forum found that it had few benefits and a potential for harm for its users, with a number of users seeking a partner to take their lives with and looking for highly lethal methods (Mokkenstorm et al. 2020).

In Canada, a similar study based on content analysis as opposed to a survey, found that non-suicidal self-injury is frequently depicted as a practical coping mechanism, compelling and addictive, and 'not always painful', on such websites. In addition, the authors note that several websites contained graphic photography, most messages related to self-harm were ambivalent, several included triggering content, and conclude that **non-suicidal self-injury content on such websites may normalize and reinforce self-harm** (Lewis & Baker, 2011).

Among **young people**, a US study examining exposure to websites that encourage self-harm and suicide found that young people who visited such websites were '**seven times more likely to say they had thought about killing themselves; and 11 times more likely to think about hurting themselves, even after adjusting for several known risk factors for thoughts of self-harm and thoughts of suicide'** (Mitchell et al. 2014).

Using data from 3,567 respondents aged 15–30 in the US, UK, Germany, and Finland**,** Minkkinen et al., 2017 found that experiences of victimization were aligned to visiting pro-self-harm sites and pro-suicide sites, and that the victimization context had significance, as online ill-treatment was associated with pro-self-harm behaviour. Becker et al., 2004 state that owners of such sites should be aware of their responsibilities regarding vulnerable young people and act responsibly within the media guidelines. They also advocate that parents should take an interest in their children's use of the internet and discuss content with them (Becker et al. 2004).

Among **older adults,** a cross-national study using data from the World Health Organization and the United Nations website found that internet use (including websites and chat rooms) for both males and females was significantly and positively associated with suicide rates in the 65–74 years and 75+ years cohorts (Shah, 2009).

Evidence also shows a relationship between internet addiction and smartphone use, and suicidal behaviour, particularly in East Asia. When conducting a meta-analysis of multinational observational studies Cheng et al., 2018 found a relationship between internet addiction and increased suicidal behaviour 'even after adjusting for potential confounding variables including depression'.

Several studies have focused on adolescents (Shinetsetseg et al. 2022; Wang et al. 2020; Liu et al. 2017; Lam et al. 2009) and young people (Wang et al. 2019). **Addiction to the internet, smartphones and online experiences have been found to be detrimental to mental health and increase the risk of self-harm and suicidal ideation among adolescents** (Shinetsetseg et al. 2022; Lam et al. 2009). Poor quality of life and internet addiction together have, furthermore, been found to be associated with suicide ideation among high school students in China (Wang et al. 2019).

Among adults, a study in Korea found that poor sleep quality may also be a confounding factor. Internet addiction with poor sleep quality was significantly corelated with lifetime suicide attempts after adjusting for demographic covariates (Kim et al. 2017).

Nevertheless, in contrast to these findings Eichenberg & Schott, 2017 found in their study of internet message boards for self-harming behaviour that self-harm forums alternatively may have a constructive effect on most users. Moreover, Til et al., 2017 note that **educative professional suicide prevention websites may increase suicide prevention related insight and may be associated with a decrease in suicidal ideation among vulnerable individuals**. A qualitative interview study of young adult website users in the UK categorised users' experiences into three perceptions, sources of empathy and understanding, as communities, and as a way of coping with social and psychological distress. The authors recommend a more balanced view of suicide and self-harm websites (Baker & Fortune, 2008). A study of suicide websites in New Zealand furthermore found that pro-suicide sites are uncommon and marginal, in comparison to sites with helpful information about suicide and those dedicated to prevention (Kemp & Collins, 2011).

In addition, an Australian study of suicide-risk individuals who use the internet for suicide-related purposes found that while those at risk of suicide reported higher risk online behaviour (such as searching for suicide methods and visiting pro-suicide sites) and low help seeking behaviour, many respondents reported reduced suicidal behaviour and less alienation after going online (Harris et al. 2009).

An Italian study examining live-chat support for people bereaved by suicide, moreover, found it was 'a safe space' to share details which are often stigmatised in wider society and to understand suicide and the motivations of their loved ones (Cipolletta et al. 2022).

Additionally, a survey of young people in Australia who went online for suicide-related reasons found that there was a substantial reduction in participants' retrospective ratings of their suicidal thoughts and behaviours between their first visit online for suicide related reasons and the time of the survey. The study concludes that **suicide-related internet use is multifaceted, and impact cannot be directly attributed to explicit types of websites or online content** (Mok et al. 2015).

7. Online suicide 'games'

In recent years, there has been an emergence of purported online suicide 'games'. There is a paucity of evidence-based research on this area, however, in the Unites States**,** a study of all public social media posts and news articles on the 'Blue Whale Challenge' indicated that the first news article on the Blue Whale Challenge was published four months after the first English language social media post and nine months after the first social media post in any language. At the end of the study period, "pro" Blue Whale Challenge posts had expanded to 127 countries. The authors conclude that **novel online risks to mental health, such as pro-suicide games or messages, can circulate quickly and globally** (Sumner et al. 2019).

Lupariello et al., 2019 report that subsequent to the publication their paper (in March 2019), there had not been a single case of suicide attributable to the Blue Whale Challenge. However several countries such as England, France, Romania, and Italy were on alert for cases. In addition, the authors remark that the internet may facilitate the spread of self-harm behaviour among vulnerable adolescents who are 'characterized by epidemiological, psychological, psychiatric, social, and cultural risk factors' (Lupariello et al. 2019). Upadhyaya and Kozman 2022 state that the Blue Whale Challenge illustrates how social media **can glorify self-harm and suicide, and amplify suicide contagion among vulnerable cohorts**. They conclude that safeguards must be introduced to stop content from being posted and children and adolescents viewing it.

A recent review of online extreme challenges putting children at risk found that challenges that lead to self-harm are most common. The review specifically references challenges that potentially lead to suicide and misuse of substances. Individuals who engage in 'challenges' were found to have problematic personality traits, making them more vulnerable to participation (Astorri et al. 2022).

8. The 'Darknet'

A Canadian study highlights the need to consider the so called 'Darknet'. The authors note that the internet encompasses both public content ("surface web"), and private content ("Deep Web") occasionally hosted on exclusive networks ("Darknets"). Their study using The Onion Router (TOR) software identified less sites dedicated to suicide on the darknet, in comparison with the surface web and noted that many were dated, inaccessible or did not contain content related to suicide or suicide methods. Nonetheless, **many of the darknet search engines facilitated access to forums which were pro-suicide and blocked or filtered by most of the surface web search engines** (e.g. Google) (Morch et al. 2018).

9. Livestream suicide / cybersuicide

Cybersuicide, or suicide mediated by the internet in various ways, is a growing phenomenon worldwide (Fratini & Hemer, 2020). The choice to livestream suicide indicates that there may be an emerging cyberculture forming around suicide, technology and self-expression (Lewis & Seko, 2016). In its initial phase, cybersuicide was linked to interactive suicide notes posted to specific online noticeboards (Baume, Cantor & Rolfe, 1997). Following this, cybersuicide developed to encompass pro-suicide websites and forums, shock websites that contain graphic suicide-related images and footage of past suicides, suicide pacts, suicide 'diaries' or notes, livestreaming of suicides, and suicide 'games' and 'challenges' (Keipi et al. 2017; Starcevic & Aboujaoude, 2015; Birbal et al. 2009 ; Baume, Cantor & Rolfe, 1997). As a result, completed suicides, nonfatal suicide attempts, and suicidal ideation are made public. They become an interactive social phenomenon for the people involved, be it through witnessing, discussing, or in some cases, facilitating the suicides of others through prescribing tasks (Fitzpatrick, Hooker & Kerridge, 2014; Niezen, 2013).

The possibility of **livestream suicides initiating a suicide contagion (the Werther Effect) has been identified as a concern in the literature** (Birbal et al. 2009). While there is a lack of research on this area, a systematic analysis of online broadcasts of suicide in China found that the most common suicide method used was cutting (57.5%), the location was most frequently at home (35.2%), and instant messaging apps (52.8%) were commonly used for broadcasting suicidal thoughts (Li et al. 2018).

10. Online suicide 'pacts'

An emerging trend in recent years centres around online suicide pacts, which are an agreed plan between two or more individuals to take their own life. A Korean study of all tweets containing the term 'suicide pact' during a 43-day data collection period identified Twitter**,** specifically, as a potential attractive place where people try to meet others to make a suicide pact (Lee & Kwon, 2018). The authors note that a significant proportion of tweets contained detailed information including the city of the user, their gender and age, favoured contact method, and preferred sex of an acquaintance. The authors claim the attractiveness of Twitter for arranging suicide pacts **may be due to particular features, for instance, a user can create several accounts with different names but without disclosing much personal information.**

As mentioned in section six, Australia, New Zealand and the United Kingdom are the only three countries to have either passed or recently amended legislation to hold individuals who assist, encourage, aid, provide guidance or procure a suicide or suicide attempt online accountable (Phillips et al. 2019 ; Cheng 2011). In the US, the Children's Internet Protection Act (CIPA) stipulates that schools and libraries must block access to harmful content online (Phillips et al. 2019).

Summary of findings

This research area is rapidly evolving with a significant increase in the number of publications in recent years (Krysinka et al. 2017). It is clear, that as the 'internet-native' generation matures, suicide and self-harm related internet use is likely to become increasingly relevant and may be a proxy indicator for intent (Padmanathan et al. 2018). During the COVID-19 pandemic, people in Ireland and throughout the world spent more time online (CSO, 2020), and social media use was associated with some adverse mental health conditions, suicidal ideation, increased fear and anxiety (Draženović et al. 2023 ; Memon et al. 2021).

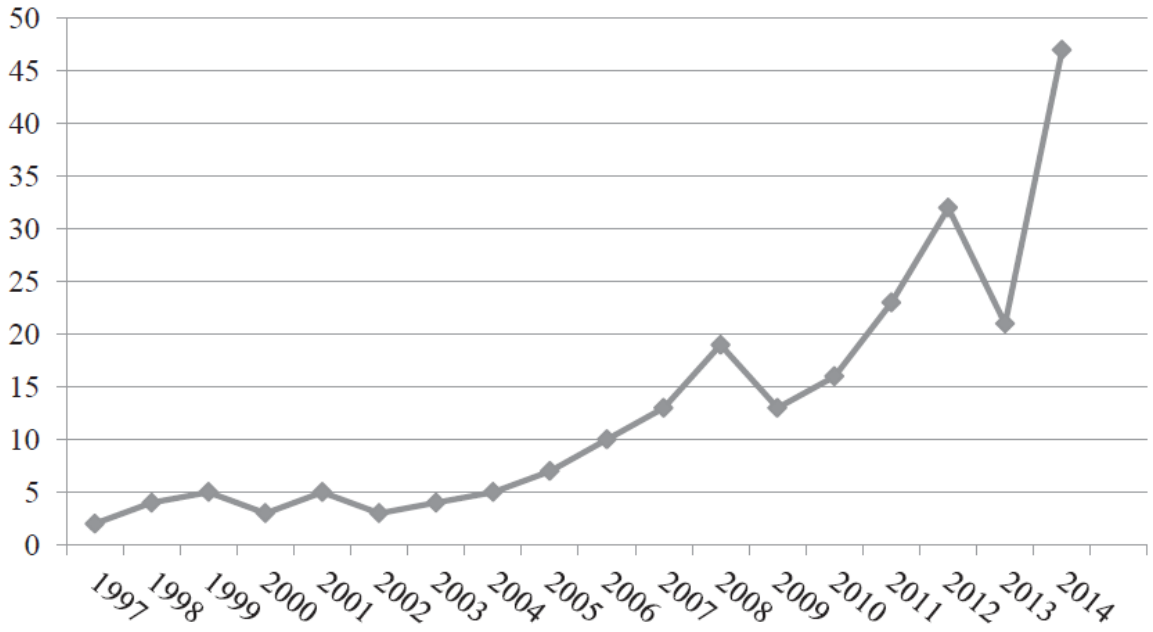

Figure 3: Number of publications on suicide and the Internet, 1997–2014 (Krysinka et al. 2017)

This review has focused on the harmful impact of suicide and self-harm content online. However, it would be remiss not to remark upon the large body of research focusing on the positive aspects of online content related to self-harm and suicidal behaviour, for example Draženović et al., 2023 found that social media provided support and a sense of connection for those who were isolated due to social distancing measures during the pandemic. Til et al., 2017 also note that educative professional suicide prevention websites may increase suicide prevention related insight and may be associated with a decrease in suicidal ideation among vulnerable individuals. Furthermore, a study of suicide websites in New Zealand found that pro-suicide sites are uncommon and marginal, in comparison to sites with helpful information about suicide and those dedicated to prevention (Kemp & Collins, 2011).

Thorn et al 2023 state that communication about self-harm online is neither entirely helpful nor harmful, advocating that experiences are influenced by individual, social, and systematic factors.

With these considerations in mind, and drawing on the review of literature, the following types of harmful content online related to suicidal behaviour and self-harm have been identified:

- **Online information sources (websites and platforms used to inform method)**
  - Easy access to information about suicide methods and pro-suicide web sites on the internet may influence a small but significant number of suicides (Gunnell et al. 2012).
  - Particularly new or emerging methods of self-harm or suicide may be promoted online as well as facilitating access to these methods (Paul et al. 2017; Chang et al. 2015).
- **Search engines**
  - Conflicting results make it difficult to draw definitive conclusions with regard to search engines. Studies have identified a positive association between suicide rates and search volume (Arendt, 2018; Chandler, 2018), including an analysis of data from fifty countries across five continents (Arendt, 2018).
  - However, others have found no relationship between "*suicide*" or "*suicide* and *methods*" searches and suicide incidence (Waszak et al. 2018; Bruckner et al. 2014; Sueki et al. 2011).
- **Social networking sites**
  - Harmful aspects of social networks include normalising self-harming behaviour; the inclusion of dialogue around motivation and triggers for self-harm, increased suicidal ideation or plans among users; and accessible depictions of self-harm acts (Dyson et al. 2016).
  - For adolescents, greater time spent on social networks has been associated with increased self-harm behaviour and suicidal ideation, linked to users receiving damaging messages promoting self-harm, copying self-harming behaviour of others, and emulating self-harm practices from shared videos. Time expended on social networks has also been found to lead to amplified psychological distress, an unfulfilled need for mental health support, adverse self-rated mental health, and increased suicidal ideation (Muslic et al. 2023; Winstone et al. 2022; Gámez-Guadix et al. 2022; Sumner et al. 2021; Shafi et al. 2020 ; Memon et al. 2018 ; Berryman et al. 2017), particularly among girls (Luby & Kertz, 2019) and among sexual and gender minority youth (Nesi et al. 2021).

- Although suicide-related online experience is a common, and likely underestimated, precursor to suicide in young people, its contributing role remains unclear (Rodway et al. 2022) but social media use may be an indicator of impulsivity (Shafi et al. 2021).
- Yet other research suggests that there are null, mixed or very small associations between time spent online and mental health problems for most adolescents (Best et al. 2014; Orben & Przybylski, 2019).

Facilitate access to potentially harmful information

- Social networks may provide access to suicide content and violent images (Daine et al. 2013). Non-Suicidal Self Injury (NSSI) behaviours are becoming common across social networks, particularly Instagram (Brown et al.2018).

Online contagion

- Social media may facilitate contagion and clusters by spreading suicidal thoughts and acts, however it may also have a positive role in supporting people at risk for suicide (Kline et al. 2023; Swedo et al. 2020 ; Brown et al. 2020 ; Fu et al. 2013)
- Memorial pages may also lead to social contagion and facilitate the rapid spread of information about deaths by suicide in the community (Robertson et al. 2012).

Normalisation of self-harming behaviour

- By viewing and reading material on social networks and pro-suicide websites a normalisation of self-harm may take place (Dyson et al. 2016; Daine et al. 2013; Lewis & Baker, 2011), which may perpetuate associated beliefs and behaviours and hinder access to treatment (Hilton, 2017).
- The sense of companionship and community generated on Twitter specifically may facilitate the normalisation of self-harm (Marchant et al. 2021; Hilton, 2017).

Celebrity suicide

- Suicide deaths of celebrities of high prominence, can lead to considerable national increases in internet search volumes for suicide-related terms (Ortiz et al. 2018) and the content of posts may show considerable changes that suggest increased suicidal ideation (Kumar et al. 2015).
- Deaths of younger celebrities may generate a higher number of posts (Ueda et al. 2017).

Cyberbullying

- Cyberbullying is a risk factor for self-harm and suicide in patients with mental health problems (Hellstand et al. 2021).

- Cyber-only bullying appears to be related to specific mental health issues beyond those associated with school-only bullying (Ossa et al. 2023)
- Victims of cyberbullying are at a greater risk of both self-harm and suicidal behaviours than non-victims (John et al. 2018).

Suicide notes

- Evidence of copycat suicides induced by suicide notes on social networking sites is unclear. However, notes may facilitate immediate intervention from other users (Ruder et al. 2011).

➢ **Online imagery and videos**

- Viewing self-harm images online may have both harmful and protective effects, but harmful effects are more prevalent (Susi et al. 2023).
- There has been an increase in harmful graphic self-harm imagery over time with an absence of moderation, anonymity, and pictures easy to find using the search function (Marchant et al. 2021).
- Depictions of self-harm acts through imagery and video may empower the normalisation of young people's self-harm and pictures may incite a physical reaction and stimulate behavioural enactment (Jacob et al. 2017).
- Graphic content aligned to self-harm is prevalent on Instagram in particular (Miguel et al. 2017) and is often obscured by unclear or secret hashtags, while subliminal messages are ethically highly problematic (Arendt et al. 2021). Time scrolling on Instagram has also been associated with normalization of self-harm and contagion (Moss et al. 2022), while content advisory warnings on this platform may not be dependable (Moreno et al. 2016).
- Videos related to self-harm are common on YouTube and may encourage the normalisation of self-harm and may enhance the behaviour through regular viewing of graphic videos (Lewis et al. 2011). However, YouTube may also provide an opportunity to engage with teenagers and to promote positive mental health (Dagar & Falcone, 2020; Lewis et al. 2018).

➢ **Online forums or message boards**

- Forums or message boards may normalise and promote self-injurious and suicidal behaviour and expose new potentially lethal behaviours to those with a history of self-harm and those exploring identity options (Whitlock et al. 2006 ; Becker & Schmidt, 2004; Becker et al. 2004).
- Yet online communications can offer important social support for otherwise isolated adolescents (Whitlock et al. 2006).

- **Pro-suicide and self-harm websites**
  - Adverse effects of visiting pro-suicide and self-harm websites include victimization, exacerbated self-harm, triggering of behaviour, seeking a partner to take your own life with and searching for highly lethal methods (Mokkenstorm et al. 2020; Minkkinen et al. 2017; Harris & Roberts, 2013).
  - Young people who visited such websites were seven times more likely to say they had thought about killing themselves and 11 times more likely to think about hurting themselves even after adjusting for several known risk factors for thoughts of self-harm and thoughts of suicide (Mitchell et al. 2014).
  - Self-harm forums and internet message boards, alternatively, may have a constructive effect on most users (Eichenberg & Schott, 2017). Suicide-related internet use is multifaceted, and impact cannot be directly attributed to explicit types of websites or online content (Mok et al. 2015).
- **Online suicide 'games'**
  - Pro-suicide games or messages online such as the 'Blue Whale Challenge' can circulate quickly and globally (Sumner et al. 2019), particularly among vulnerable adolescents (Lupariello et al. 2019).
  - The Blue Whale Challenge illustrates how social media can glorify self-harm and suicide, and amplify suicide contagion among vulnerable cohorts (Upadhyaya & Kozman. 2022).
- **The 'Darknet'**
  - People may be more exposed to harmful suicide and self-harm content when using the 'darknet'. Many darknet search engines facilitate access to forums that are pro-suicide and blocked or filtered by most of the surface web search engines (e.g. Google) (Morch et al. 2018).
- **Livestream suicide/Cybersuicide**
  - The possibility of livestream suicides initiating a suicide contagion (the Werther Effect) has been identified as a concern in the literature (Birbal et al. 2009), however, there is a lack of research on this area.
- **Online Suicide 'pacts'**
  - Suicide 'pacts' are an agreed plan between two or more individuals to take their own life. Twitter, specifically, has been identified as a potential attractive place where people try to meet others to make a suicide pact. This may be due to particular features such as a user's ability to create several accounts with different names but

without disclosing much personal information (Lee & Kwon, 2018), which poses challenges to intervene in a timely manner.

Next step recommendations and key priority areas for the future

Implications for internet service providers and the social media industry

Reducing the dissemination of methods and harmful imagery

There is a need for longer-term preventive action in relation to dissemination of suicide methods (Gunnell et al. 2012), images related to self-harm (Brown et al. 2018) and harmful information on the internet.

Internet service providers should be encouraged to regularly review content and advisory notices (Moreno et al. 2016), remove pro-suicide sites promoting the use of high-lethality methods (Gunnell et al. 2015) and take appropriate measures for preventing online social contagion (Brown et al. 2018). Monitoring and regulating online information on methods may also be beneficial (The Samaritans,2020 ; Chang et al. 2015).

The implementation of evidence-informed guidelines for sites and platforms hosting user generated content is recommended (The Samaritans, 2020). However, mechanisms to limit or prohibit harmful content must be implemented with caution to avoid causing unintentional harm (Lavis & Winter, 2020).

Implications for clinicians

Pro-suicide and self-harm websites and forums/message boards

Increased understanding on how individuals are impacted by pro-suicide and self-harm websites is required (Lewis & Baker, 2011). Professionals and stakeholders working in the area of suicide prevention need to be mindful of the existence and potential risk of such websites and communicate with youth in a meaningful, balanced way about them to promote safety and indicate risk (Biddle et al. 2018 ; Mitchell et al. 2014).

The internet may provide an important pathway for accessing information and perceptions valuable in clinical settings (Whitlock, Powers & Eckenrode, 2007). It may be beneficial to include digital self-harm, use of pro-suicide and self-harm websites and viewing of harmful content online as a standard item during clinical assessment (Patchin, Hinduja & Meldrum. 2023; Semenza et al. 2022; Marchant et al. 2021; Shafi et al. 2020; Padmanathan, 2018 ; Marchant et al. 2017)

Systematic investigation of pro-suicide forums that are accessible using The Onion Router and their users are required. New innovative strategies to prevent suicidal behaviour may need to be developed for 'Darknets' (Morch et al. 2018).

Implications for policy makers and statutory bodies

Normalisation of self-harm and suicidal behaviour

Social media and the accessibility of celebrity discourse can contribute to normalising self-harm which may prolong and exacerbate associated behaviours and delay help seeking (Hilton, 2017). Further research examining if social media facilitates or deters suicidal behaviour is warranted.

Protection and safety frameworks, in addition to voluntary industry codes of conduct to prevent normalisation of harmful behaviour related to suicide and self-harm should be considered (The Lancet, 2019).

Online Contagion

The possible role of social networks and the internet in contributing to self-harm and suicide contagion has been highlighted in this review.

Guidelines and protocols to support communities in managing clusters should be updated to reflect the extensive use of communication technologies in modern society (Fu et al. 2013 ; Robertson et al. 2012). It would be beneficial for guidelines to include preventative measures that a community should take to minimize the potential for contagion using mobile phones and the internet (Swedo et al. 2020 ; Robertson et al. 2012).

A focus on safe browsing also warrants consideration, in addition to tools that limit time and diversify content (Brennan et al. 2022).

Celebrity Suicide

This report has identified that suicide deaths of celebrities of high prominence can lead to significant national increases in internet search volumes for suicide-related terms.

It is important that suicide deaths are reported sensibly and responsibly in the media in compliance with the media guidelines for reporting suicide (Ortiz et al. 2018 ; Ueda et al. 2017 ; The Samaritans 2013). Implementation of guidelines should form part of the curriculum of journalists and editors, and warrant inclusion in press codes of conduct for journalists (McTernan et al. 2018).

Online 'suicide games'

Novel online risks to mental health, such as pro-suicide games can circulate quickly and globally**.**

Early detection of coercions related to suicide and mental health is required and further research to identify emerging harms in real time is needed (Sumner et al. 2019). Safeguards must be introduced to stop content from being posted and children and adolescents viewing it (Upadhyaya & Kozman. 2022).

Enhanced attention on innovative approaches to identify threats may play an important role (Sumner et al. 2019). Empowering young people to share user experiences and contribute to online safety initiatives may produce positive outcomes (Biddle et al. 2022; Marchant et al. 2021).

Education

Focused psychoeducation on the harmful aspects of online activity may be beneficial for vulnerable adolescents (Memon et al. 2018).

There are also indications that educative components of evidence informed websites for young individuals in crisis may be effective among individuals with some degree of vulnerability (Til et al. 2017). Working with internet service providers and search engines to optimise such support sites may prove advantageous (Biddle et al. 2015). A visible presence of specialised mental health professionals online, providing high-quality recovery-oriented material, may also be of benefit (Marchant et al. 2021; Chen et al. 2021).

The adaption of evidence-informed guidelines to inform young people, including influencers, how to talk safely about suicide on social media such as those developed by the chat safe project may have long term benefits for young people and those who support them e.g., parents, teachers, community workers and health professionals (Robinson et al. 2023 ; Thorn et al. 2023 ; Robinson et al. 2020 ; Robinson et al. 2018). Digital citizenship training, likewise, may help to educate young people on how to use technology safely and responsibly (Mars et al. 2020).

Need for systematic research and evidence-based interventions

Further evaluation of the association between problematic use of social media/internet and suicide attempts in young people through longitudinal studies (Susi et al. 2023 ; Sedgewick et al. 2019) and tailored, methodologically rigorous high-quality multidisciplinary research, including during the COVID-19 pandemic, is needed (The Lancet, 2019; Lupariello et al. 2019; Daine et al. 2013).

Qualitative research may highlight gender differences in risk factors to inform the development of public education campaigns and personalized treatment options (Gunnell et al. 2018; Hilton, 2017).

Implications for statutory and non-statutory bodies who provide help online

Crisis intervention

Evidence suggests that vulnerable young people are more likely to visit harmful websites online. This may provide an opportunity for help-seeking (Lavis & Winter, 2020 ; Mitchell et al. 2014).

It may be advantageous to examine the therapeutic benefit of connections users make online (Marchant et al. 2017; Robinson et al. 2016 ; Dyson et al. 2016) as this may act as a vehicle to reach those who engage in self-harm (Lewis & Baker, 2011) and encourage them to seek professional help (Memon et al. 2018).

New technologies (Forte et al. 2021) and novel initiatives such as online gatekeeping (Sueki et al. 2022) and Suicide Watch (Dutta et al. 2021) have shown promise, however further approaches, and research are required to ascertain the efficacy and safety of potential social media-based interventions. Moreover, ethical standards and protocols to ensure that such interventions are implemented safely need to be developed, including specialised training and professional practices for moderators to deliver effective and appropriate support to people at risk (Perry et al. 2021 ; Robinson et al. 2016 ; Robinson et al. 2015). Prospective, longitudinal investigations are also desirable to identify potential short- and long-term harms associated with use (Dyson et al. 2016).

Efforts to facilitate individuals' access to evidence-based online resources are also needed (Miguel et al. 2017 ; Lewis et al. 2014 ; Szumilas & Kutcher, 2009). Suicide prevention websites should be designed with consideration for vulnerable individuals who are more inclined to look for suicide-related information online (Chandler, 2018).

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Appendices

Appendix 1: List of search strings

The search strings included the following terms:

("Suicide"[Title/Abstract] OR "Suicidal behaviour"[Title/Abstract] OR "Attempted suicide"[Title/Abstract] OR "Suicidality"[Title/Abstract] OR "Suicidal ideation"[Title/Abstract] OR "Suicide planning"[Title/Abstract] OR "Pro suicide"[Title/Abstract] OR "Suicide pact"[Title/Abstract] OR "Self-harm"[Title/Abstract] OR "Self-injury"[Title/Abstract] OR "Self-injurious behaviour"[Title/Abstract] OR "Self-destructive behaviour"[Title/Abstract] OR "Self-mutilation"[Title/Abstract] OR "Harmful behaviour"[Title/Abstract] AND ("social media"[Title/Abstract] OR "online social network"[Title/Abstract] OR "Facebook"[Title/Abstract] OR "Twitter"[Title/Abstract] OR "Instagram"[Title/Abstract] OR "YouTube"[Title/Abstract] OR "WhatsApp"[Title/Abstract] OR "Weixin"[Title/Abstract] OR "Wechat"[Title/Abstract] OR "Hashtag"[Title/Abstract] OR "Tagged"[Title/Abstract] OR "Internet"[Title/Abstract] OR "Internet addiction"[Title/Abstract] OR "Website"[Title/Abstract] OR "World wide web"[Title/Abstract] OR "Online"[Title/Abstract] OR "Online platform"[Title/Abstract] OR "Online forum"[Title/Abstract] OR "Online video"[Title/Abstract] OR "Online image"[Title/Abstract] OR "Online gaming"[Title/Abstract] OR "Blog"[Title/Abstract] OR "Chatroom"[Title/Abstract] OR "Chat"[Title/Abstract] OR "Computer"[Title/Abstract] OR "Cyber"[Title/Abstract] OR "Virtual"[Title/Abstract] OR "Online search engine"[Title/Abstract] OR "Live stream"[Title/Abstract] OR "LiveJournal"[Title/Abstract] OR "Messaging"[Title/Abstract] OR "Messaging application"[Title/Abstract] OR "Messaging app"[Title/Abstract] OR "Instant messaging"[Title/Abstract] OR "Private communication"[Title/Abstract] OR "Ecommerce"[Title/Abstract] OR "Online storage"[Title/Abstract] OR "Cloud storage"[Title/Abstract] OR "Email"[Title/Abstract] OR "Product review"[Title/Abstract] OR "Customer review"[Title/Abstract] OR "Consumer review"[Title/Abstract] OR "Customer testimonials"[Title/Abstract] OR "Consumer testimonials"[Title/Abstract] OR "Customer feedback"[Title/Abstract] OR "Consumer feedback"[Title/Abstract] OR "Online feedback"[Title/Abstract] OR "Online review"[Title/Abstract] OR "Comment moderation"[Title/Abstract] OR "Comment section"[Title/Abstract] OR "Amazon"[Title/Abstract] OR "Ebay"[Title/Abstract] OR "Pinterest"[Title/Abstract])