



Review Article

Social media and suicide prevention:
a systematic reviewJo Robinson,¹ Georgina Cox,¹ Eleanor Bailey,¹ Sarah Hetrick,¹ Maria Rodrigues,² Steve Fisher² and Helen Herrman¹**Abstract**

Aim: Social media platforms are commonly used for the expression of suicidal thoughts and feelings, particularly by young people. Despite this, little is known about the ways in which social media can be used for suicide prevention. The aim of this study was to conduct a systematic review to identify current evidence pertaining to the ways in which social media are currently used as a tool for suicide prevention.

Methods: Medline, PsycInfo, Embase, CINAHL and the Cochrane Library were searched for articles published between 1991 and April 2014. English language articles with a focus on suicide-related behaviour and social media were included. No exclusion was placed on study design.

Results: Thirty studies were included; 4 described the development of social media sites designed for suicide prevention, 6 examined the potential of

social media in terms of its ability to reach or identify people at risk of suicide, 15 examined the ways in which people used social media for suicide prevention-related purposes, and 5 examined the experiences of people who had used social media sites for suicide prevention purposes. No intervention studies were identified.

Conclusion: Social media platforms can reach large numbers of otherwise hard-to-engage individuals, may allow others to intervene following an expression of suicidal ideation online, and provide an anonymous, accessible and non-judgmental forum for sharing experiences. Challenges include difficulties controlling user behaviour and accurately assessing risk, issues relating to privacy and confidentiality and the possibility of contagion. Social media appears to hold significant potential for suicide prevention; however, additional research into its safety and efficacy is required.

Key words: review, social media, suicide.

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INTRODUCTION

The World Health Organization (WHO) estimates that suicide is the 13th leading cause of death worldwide, and is the leading cause of death among those aged between 15 and 39. Globally, it is estimated to account for approximately 1 million deaths per year. The prevalence of non-fatal suicide-related behaviour, such as suicide attempt, is more common and may be up to 20 times higher than fatal suicidal behaviour, with an estimated 10–20 million non-fatal attempted suicides occurring every year worldwide.¹

However, despite its prevalence, limited evidence exists with regard to the efficacy of interventions designed to reduce suicide risk, including among young people.² This is the case in both clinical³ and school settings.⁴

The last decade has seen the Internet become an increasingly powerful form of information and communication media, in particular among young people.⁵ It is also becoming widely used in the treatment of a range of health-related problems, including adolescent depression and anxiety.⁶ However, to our knowledge, to date only one small pilot study has tested the effects of an Internet-based program

among suicidal young people, and found it to be safe, acceptable and potentially efficacious.^{7,8}

The technological foundations of Web 2.0 extended the capacity of the Internet by enabling users to not only receive information, but also to create and exchange their own content, leading to the advent of social media websites. As such, social media has been defined as a group of mobile and Internet-based applications that allow the creation and exchange of user-generated contents.^{9,10} Systematic categorization of social media is difficult due to the fact that cyberspace is constantly evolving; however, commonly used forms of social media include social networking sites, such as Facebook; blogs and microblogs, such as Tumblr and Twitter; collaborative projects, such as Wikipedia; and content communities, such as YouTube.⁹

The growth of Internet-based communication and social media has presented a new set of challenges for the field of suicide prevention. Indeed, concerns have long been expressed with regard to the safety of talking about suicide using more traditional forms of media. For example, articles that sensationalize suicide, contain explicit descriptions of means of suicide, or portray suicide as a legitimate solution to one's problems are believed to increase the risk of contagion, particularly among already vulnerable individuals.^{11,12} Social media sites, which can be used for the expression of suicidal feelings and for the communication about suicide-related behaviour with others, may exacerbate this.^{13,14} This has raised a series of questions regarding the ways in which we talk about suicide in online environments and how this may affect others.¹⁵

Despite the possible risks involved, social media's increasing popularity, especially with young people who are often hard to engage in traditional forms of treatment,¹⁶ and its potential as a tool for preventing and/or treating depression¹⁷ suggest it has potential to be used as a preventative tool.¹⁸ For the most part, however, the extent of this potential remains unknown. Indeed, while systematic reviews exist that examine the effects of social media-based interventions on depression,¹⁷ and the effects of Internet-based interventions on suicide-related behaviour,¹⁹ none actually examines the effects of social media-based platforms on suicide-related outcomes.

Therefore, the aim of this study was to conduct a systematic review in order to identify current evidence pertaining to the ways in which social media are currently being used as a tool for suicide prevention. As such, we specifically focused on those studies that reported on the ways in which social media platforms are currently being used in preven-

tative ways as opposed to studies that described the possible negative impacts social media may have.

METHODS

Search strategy

An electronic literature search was conducted following the methodology set out in the Cochrane Collaboration Handbook for Systematic Reviews.²⁰ Medline, PsycInfo, Embase, CINHALL and the Cochrane Library were searched for articles published between 1991 until April 2014. The following keywords formed the basis of the search: (suicid* OR attempted suicid* OR Self-Injurious Behavior* OR DSH OR deliberate self-harm) AND (web* OR online* OR blog OR internet OR computer* OR chat* OR tech* OR dot* OR cyber* OR virtual OR surf OR electronic OR social media OR facebook OR twitter OR linkedin OR pinterest OR myspace OR google+ OR deviantart OR livejournal OR tagged OR Orkut). The top 10 most popular websites included in the search string were selected from the following site: <http://www.forward.ph/blog/top-10-most-popular-social-networks-2013/>. In addition, reference lists of all included studies, and previous literature reviews were hand-searched.

Study inclusion criteria and classification

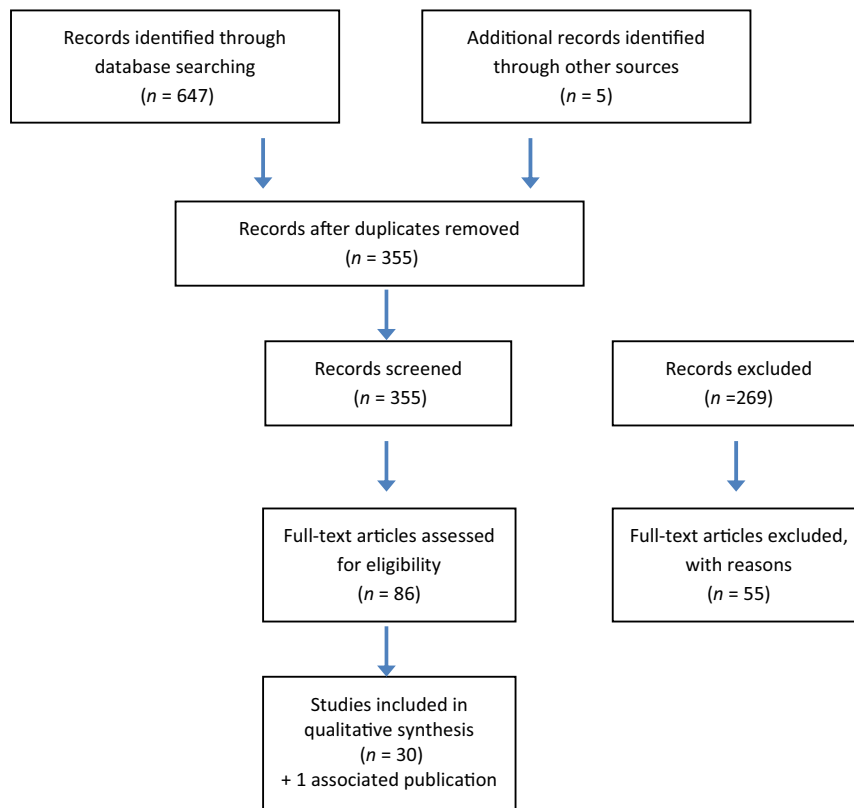
English language studies published in a peer-reviewed journal were included in the review. Studies had to focus on either suicide or suicide-related behaviour, and on the development, or use, of a social media platform as a vehicle to support people at risk of suicide. Because this is an emerging field and we wanted to examine a broad range of studies, no restriction was placed on study design.

Studies were excluded if: they did not have a preventative focus (e.g. studies that focused on the link between cyber-bullying and suicide, or that reported on the association between social media use and suicide-related behaviours); they reported on a non-interactive website; they examined the representation of suicide on the Internet by analysing web pages retrieved through the 'Google' search engine; or if they focused on non-suicidal self-injury only. Reviews and editorials were also excluded.

Included articles were then classified according to the research question the original study aimed to answer. These were:

- 1 What format do social media sites develop specifically for the purpose of suicide prevention take?

FIGURE 1. Prisma flow diagram. Note: One record retrieved was nearly identical to a more recent record. This record has been classed as an 'associated publication'.



- 2 What is the potential of social media in terms of its ability to 'reach' and identify people at risk of suicide prevention?
- 3 How do people use social media sites for suicide prevention-related purposes? (This included sites that had been specifically developed for the purpose of suicide prevention, and already existing sites, e.g. MySpace.)
- 4 What are the experiences of people who use social media sites for suicide-related purposes?

Data extraction

Data were extracted by two study authors (GC and EB) with input from a third author (JR). Where possible, data pertaining to study design and aims, target population, study methodology, website format or content and presence or absence of moderation and safety protocols (where appropriate), participant or user characteristics, key findings or results, including limitations or challenges and study conclusions were extracted. A narrative synthesis of all data was conducted, as this was most appropriate given the nature of the included studies.

RESULTS

Search results

Search results are summarized in the Prisma Flow Chart in Figure 1 below. As can be seen, the initial search produced 652 results. One author (GC) removed duplicate papers and screened the titles and abstracts of all remaining papers for possible inclusion ($n = 355$). At this stage, any papers that did not meet the inclusion criteria for this review were excluded ($n = 269$). The full text was retrieved for the remaining 86 papers. These were then screened for inclusion by two authors (GC and JR). Of these, 55 were excluded for the following reasons: 22 were review articles, conference proceedings, editorials or study protocols; 19 did not focus on the role of social media in suicide prevention; 6 focused on the relationship between Internet search terms and suicide-related behaviour; 4 described non-interactive sites; 2 focused on non-suicidal self-injury; and 2 could not be obtained.

The 1998 study by Baume²¹ was a publication based on an earlier paper published in 1997 by the same authors²² and contained additional discussion

points. For the purpose of this review, the 1997 record was classed as a secondary publication to the 1998 paper. Ultimately, 30 separate studies were included in the current review.

Description of studies

The studies included in the current review adopted a range of methodological approaches. These included: studies that examined the structure, format or operation of social media platforms; studies that mapped the linkages between or reach of various social media platforms; studies that analysed the content of social media sites or platforms using either qualitative and/or quantitative techniques; studies that administered either interviews or surveys to users of social media sites or platforms; individual case studies of people who had self-harmed; and case series studies of people who had self-harmed.

Studies were classified as per the research questions described above. The key characteristics of these studies are summarized in Tables 1–4.

What format do social media sites develop specifically for the purpose of suicide prevention take?

Four studies sought to answer this question. Two of these specifically targeted suicidal individuals and comprised email, instant chat, and online forums, as well as information-based articles and lists of support organizations.^{23,24} One site targeted the staff and students of an American university.²⁵ This site comprised a static website containing information, emergency contact information, and an online course, and used social media platforms MySpace and Facebook in order to increase the visibility of, and provide information about, the program. The final study targeted mental health professionals who work with suicidal people.²⁶ This site took the form of an interactive website and chat room that enabled users to access professional development resources, to give and receive peer support, and to disseminate, exchange and share information.

Together, these studies found that the websites described were well used. Benefits to individuals at risk included the potential for emotional support, reduced feelings of isolation and the 24-h nature of help,^{23,24} while benefits of the site targeting professionals resulted in the exchange knowledge and expertise that would not otherwise have been shared.²⁶ Challenges included difficulties controlling member participation, difficulties accurately assessing the emotional state of participants

online,²³ the emotional burden on volunteers and the potential for technological problems.²⁴

What is the potential of social media in terms of its ability to 'reach' and identify people at risk of suicide prevention?

In terms of reach, one study specifically set out to answer this research question. This study conducted a series of Monte Carlo simulations in order to examine how well MySpace could be used to target prevention research towards lesbian, gay and bisexual adolescents.²⁷ This study found that a peer-driven preventative intervention delivered via MySpace was able to reach more than 18 000 individuals, a significantly larger sample that could be reached via more traditional methods, thus highlighting the potential reach of suicide prevention activities delivered via social media.

However, other studies also reported findings relevant to this question. For example, the study by Fu and colleagues primarily sought to examine responses to a wrist-cutting picture posted on a Chinese microblogging site.²⁸ However, in addition to high numbers of positive messages, they also reported large numbers of 'reposts' indicating that networks such as these can be activated quickly in emergency situations, thereby highlighting the potential for social networking sites to be used to support and detect at-risk individuals and to possibly facilitate intervention in suicide attempts. This was echoed by Belfort *et al.*'s examination of people who post suicide notes online, which found that the majority of participants who disclosed their suicidality electronically subsequently presented to services for help because a peer had seen the information and either shared it with an adult or encouraged the young person to seek help.²⁹ This latter study also highlights the potential that social media can offer in terms of early identification of individuals at risk.

Two case studies elicited similar findings. The first of these reviewed a case report in which a clinician discovered the suicidal ideation of a client on Facebook and took actions that led to a hospital admission.³⁰ The second presented a case study involving a suicide note posted on Facebook by a person who subsequently completed suicide.³¹ The authors discuss the ethical challenges raised by these scenarios, including issues relating to privacy and confidentiality, clinical judgment, and informed consent, plus the potential risk that 'copycat' events may occur. However, despite these challenges, both studies highlight how the public nature of suicide-related social media posts can provide opportunities for intervention.

TABLE 1. Studies that described the format and use of social media sites specifically for people at risk of suicide

Study	Methodological approach	Study description	Website format/contents and user characteristics	Moderation Yes/No	Safety protocols Yes/No	Reported challenges/ethical issues	Reported benefits
Barak (2007)	1	This study described the development and function of a website specifically designed for suicidal individuals (sahar.org.il).	<p>Format: The site comprises: instant messaging and asynchronous email; open access online forums; information-based articles; a list of support organizations, hotlines and emergency numbers; recommended readings; and links.</p> <p>User characteristics: Majority are under 30 years old. No differences between male or female users are reported. At least 50% of site visitors report current suicidality.</p>	<p>Yes: The site is moderated by trained 'helpers' who provide support in forums and moderate the groups. There is a closed forum for helpers to share information about forum members so all helpers are up to date. The SAHAR manager closely watches all communication channels.</p>	<p>Yes: Protocols include detailed guidelines to protect participants and help manage online behaviour. In an emergency, personal chat is immediately offered to anyone indicating distress. All personal chats are logged and can be accessed by helpers any time. The group chat room is password protected and users have to pre-register. Yes: An 'ethical code' defines professional principles of the helping interactions and sets ethical boundaries. Moderators respond to any messages of distress and delete messages that seem harmful. In case of suicide risk, all necessary measures are taken to save lives. Callers are urged to seek professional help in addition to using the group.</p>	<ol style="list-style-type: none"> 1. Anonymity means imposters sometimes abuse helpers. 2. Online communication is not suitable for everyone. 3. Emotional load/burden of involvement on helpers can lead to 'burnout'. 4. Volunteer helpers need to remain disciplined and committed. 5. Unreliable technology. 	<ol style="list-style-type: none"> 1. Authors report high usage of the site, that is, the site is accessed approximately 10 000 times per month by distressed individuals (half are suicidal); forums receive 200 + new messages a day. 2. It has allowed for intervention in 100+ suicides. 3. Provides a forum for people who are shy and for high-profile people who wish to remain anonymous. 4. User feedback suggests the site is helpful and supportive.
Gilat & Shahr (2009)	1	This study described the development and function of a website specifically designed for suicidal individuals.	<p>Format: The website provides an online support group based on a model of 'Emotional First Aid for Suicide Prevention Online' that comprises four components: (1) emotional support offered via an online support group, personal chat, email and telephone hotline; (2) use of paraprofessionals (i.e. trained volunteers as moderators); (3) supervision from a mental health professional; (4) a professional and ethical code governing behaviour of callers and volunteers.</p> <p>User characteristics: Not reported.</p>	<p>Yes: The site is moderated by trained volunteers. A mental health professional is responsible for recruiting, training and supervising volunteers. Major decisions are made by the mental health professional.</p>	<p>Not reported</p>	<ol style="list-style-type: none"> 1. Difficult to control member participation and prevent distress to others. 2. Difficult to accurately assess the emotional state of participants. 3. Mental health professionals have a responsibility to protect clients from harming themselves; however, due to the anonymity that social media affords this can be a challenge. 	<ol style="list-style-type: none"> 1. Support offered by online groups may instill hope, universality, group cohesiveness and catharsis. 2. 'Meeting' others with similar experiences may reduce isolation and emotional pain. Cognitive distortions may be reframed due to multiple perspectives available. 3. Help and support can be available at all times. 4. Suicidal people often find it helpful to express themselves in writing, which may contribute to reduced pain.
Manning & VanDeusen (2011)	1	This study described an online suicide prevention initiative specifically targeting staff and students of Western Michigan University in the USA.	<p>Format: Comprises a static website with information, links to fact sheets and resources plus emergency contact information, and an online course for faculty and staff members about recognizing and managing suicide risk. The developers also created profiles on MySpace and Facebook to increase the visibility of, and provide information about, the program, and to advertise and direct students to the website.</p> <p>User characteristics: Students and staff of Western Michigan University</p>	<p>Not reported</p>	<ol style="list-style-type: none"> 1. The impact of the initiative on help seeking remains unknown. 2. Low rates of participation in the online course. 	<ol style="list-style-type: none"> 1. Facebook and MySpace were successful methods of disseminating information about suicide prevention. 2. Students provided positive feedback, with the pages receiving lots of 'likes' and 'friend requests'. 	
Penn et al. (2005)	1	This study described the development of an online support system (ACROSS.net) designed to support mental health staff working with suicidal individuals.	<p>Format: An interactive website with three levels of access. Level 1 is available to community members and provides information, FAQs, postvention materials, and a list of services and helplines. Level 2 provides mental health professionals with peer support and networking opportunities, and access to professional development resources. Level 3 provides them with a chat room to disseminate, exchange and share information.</p> <p>User characteristics: Not reported.</p>	<p>Not reported</p>	<p>Only broad scenarios are discussed in chat forums. Participants are identified only by a user name. Site is encrypted. Discussion is underway regarding risks involved in discussing individual cases.</p>	<p>The forum allows for the exchange of a much larger range of knowledge and expertise than could be assembled offline, and is reported to be highly popular among rural mental health workers.</p>	

TABLE 2. Studies that examined the potential of social media sites in terms of their ability to reach and identify people at risk of suicide

Study	Methodological approach	Aims	Study description	Results	Methodological limitations/ethical issues	Main benefits/successes
Belfort <i>et al.</i> (2012)	6	The study examined the similarities and differences among adolescents who communicated their suicidality via electronic versus other means.	Reviewed consecutive adolescent psychiatric emergency room assessments (at the Children's Hospital in Boston) from 2005 to 2009 for chief complaint of suicidality. Obtained demographic information plus details of how and to whom the patient communicated their suicidality. Those who communicated this verbally, with a handwritten note, and electronically were compared according to gender, socioeconomic status and the recipients of those messages.	Of 1350 evaluations, 36 adolescents (75% female) communicated their suicidality electronically. Sixty-seven per cent communicated to a peer and only 33% to an adult. Over the 4-year period, electronic communication of suicidality increased.	It is unknown how adolescents in general handle this type of peer disclosure.	The majority of adolescents who disclosed suicidality electronically subsequently presented to the emergency room because a peer shared information with an adult or encouraged access to care.
Jashinsky <i>et al.</i> (2013)	3	This study examined whether at-risk conversations occurring on Twitter are related to suicide rates.	Filtered 1 659 274 tweets from between 15 May 2012 and 13 August 2012 from the Twitter stream using keywords and phrases created from suicide-risk factors. Grouped 37 717 tweets by state and calculated departures from expectation. Compared values for suicide tweeters with suicide rates (obtained from the Centre for Disease Control and Prevention). Case study of a man in his 20s with mental health problems. The man's mental health worker became concerned about his safety after viewing images of him on Facebook depicting suicide methods. This led to a hospital admission. The client denied suicidal intent despite the images. He felt that it was a violation of his rights to admit him to hospital on the grounds of the images, although he agreed to subsequent support. The worker did not believe that the therapeutic alliance had been compromised as a result of these events.	There was an association between rates of tweeters determined to be at risk for suicide and actual suicide rates.	Could not differentiate between levels of suicidal intent.	Findings provide initial support for the use of Twitter as a potential dataset for future suicide research and a platform for public health and social service interventions.
Lehavot <i>et al.</i> (2012)	5	This study reviewed a case report in which a clinician discovered suicidal ideation expressed by a client on Facebook.	The authors identified several issues concerning the use of social media in clinical practice: (1) Beneficence and maleficence: The clinician's behaviour was motivated by concern for the client's safety. Failure to act could be seen as negligent and has negative consequences for the client. However, taking action relied upon information not directly assessed by the clinician; hence the client may have lost trust in the clinician. (2) Privacy and confidentiality: The client's privacy was not breached in a legal sense as his profile page was public. However, he may still have felt that his privacy was compromised. (3) Multiple relationships: Contact with a client via Facebook constitutes interacting outside the agreed therapeutic exchange. Therefore, it must be by mutual agreement and it may present difficulties for clients who have problems with boundaries. (4) Clinical judgment: Social networking environments present difficulties when judging the accuracy of information and assessing risk. (5) Informed consent: A clear policy for using the Internet for clinical purposes and obtaining informed consent could enhance transparency and prevent confusion.	The authors identified several issues concerning the use of social media in clinical practice: (1) Beneficence and maleficence: The clinician's behaviour was motivated by concern for the client's safety. Failure to act could be seen as negligent and has negative consequences for the client. However, taking action relied upon information not directly assessed by the clinician; hence the client may have lost trust in the clinician. (2) Privacy and confidentiality: The client's privacy was not breached in a legal sense as his profile page was public. However, he may still have felt that his privacy was compromised. (3) Multiple relationships: Contact with a client via Facebook constitutes interacting outside the agreed therapeutic exchange. Therefore, it must be by mutual agreement and it may present difficulties for clients who have problems with boundaries. (4) Clinical judgment: Social networking environments present difficulties when judging the accuracy of information and assessing risk. (5) Informed consent: A clear policy for using the Internet for clinical purposes and obtaining informed consent could enhance transparency and prevent confusion.	This was an individual case study and the author was an active participant, therefore the conclusions drawn may be subjective and may not necessarily be generalizable to other circumstances or settings.	The author made several recommendations. These included developing policies regarding internet searches of clients that involve informed consent forms and other documents. Professionals need to expect that they may inadvertently come across a client online. Finally, even when legal breaches of privacy are not an issue, protecting the therapeutic alliance should always be a primary concern.

Table 2. Continued

Study	Methodological approach	Aims	Study description	Results	Methodological limitations/ethical issues	Main benefits/successes
Ruder <i>et al.</i> (2011)	5	This case study discussed the potential effects of suicide notes posted on Facebook on suicide prevention and copycat suicides, and to create awareness among health professionals.	Case study of a 28-year-old man who posted his intention to take his life on Facebook. The post was seen by a friend who tried unsuccessfully to intervene.	Notes are instantly visible to a large audience, which provides an opportunity for intervention. There is also the opportunity for early intervention when warning signs appear. This case illustrates that Facebook users do actively intervene to prevent suicide attempts. Posting suicide notes on social networking sites is a new phenomenon, and clinicians should be aware of this. It is unclear if the effect of such notes will lead to greater encouragement of suicide or opportunities for prevention, and evaluation is required.	This was an individual case study and therefore the study findings may not necessarily be generalizable to other settings or circumstances.	This case highlights the opportunity afforded by social media for intervention in suicides. The authors also speculate that (unless the poster is famous) any contagion effect would likely be minimal compared to the potential effect of the wider reach of print and TV media; however, this is yet to be studied empirically.
Silenzio <i>et al.</i> (2009)	2	This study explored the online social networks used by LGB youth on MySpace in order to determine the maximum number of people who could be reached using this method for future suicide prevention research purposes.	Used an automated data collection program to map connections between self-identified LGB individuals (100 014 users aged 16–24); conducted descriptive analysis of the structural characteristics known to affect diffusion within such networks; ran a series of Monte Carlo simulations of peer-driven diffusion of a hypothetical preventative intervention.	Monte Carlo simulations revealed that a peer-driven preventative intervention could reach up to 18 409 individuals.	Data were obtained without consent from MySpace users; this raised ethical issues for the authors.	It is possible to reach a much larger sample of LGB young people than previously thought. This method can also be applied to other populations.
Won <i>et al.</i> (2013)	3	The study examined potential of social media to predict completed suicide at the population level.	Used Naver Blog (weblog service in South Korea) data from January 2008 to December 2010. To quantify data, the authors defined two measures: (1) suicide weblog count (daily frequency of posts mentioning suicide at least once) and (2) dysphoria weblog count (daily frequency of posts mentioning word 'himdeulda', meaning tired, painful or exhausted).	Social media variables were significantly associated with nationwide suicide numbers. Dysphoria weblog count was a more powerful predictor than suicide weblog count. Key variables were powerful up to 2 weeks before the index. Celebrity suicide contagion effects were evident.	The authors could not include all variables known to be associated with suicide into the model (i.e. allergen exposure).	Results suggest it may be feasible to include social media data in surveillance of suicide trends and prevention strategies.

LGB = lesbian, gay and bisexual.

TABLE 3. Studies that examined the ways in which people use social media sites for suicide prevention-related purposes

Study	Methodological approach	Aims	Study description	Results	Methodological limitations/ethical issues	Main benefits/successes
Barak & Miron (2005)	3	This study examined the writing of suicidal versus non-suicidal users in an online forum (sahar.org.il). It was a descriptive study that comprised three nested studies. Study 1 examined attribution style, study 2 examined self-focused expression, and study 3 examined suicidal themes.	Compared three categories of forum users (identified by their membership in different forums): (a) suicidal; (b) distressed but not suicidal; (c) not distressed. Randomly selected user messages which were analysed using Content Analysis Verbatim Explanations (CAVE) and Lenears' (1996) thematic guide for predicting suicide. Both papers discussed the same three individuals (all male) who had posted a suicide note on a specific website (alt:suicide.holiday newsgroup). These cases were followed for 3 months. The 1998 paper used the case studies to understand the impact of Internet on suicidal behaviour and consider approaches to suicide prevention.	Suicidal users expressed a depressogenic attribution style, self-focused communication, and conveyed unbearable psychological pain and constrictive cognitive themes. Suicidal users were able to be distinguished from non-suicidal users by their writing, especially themes of psychological pain and cognitive constriction.	Assessment of themes – agreement between the three judges was sometimes too low (in study 3) which prevented discriminatory capability.	Findings support rationale behind the cognitive approach in suicide prevention and also support self-focus hypothesis of suicidal writing. Findings suggest the assessment potential of online writing.
Baume <i>et al.</i> (1998) and Baume <i>et al.</i> (1997)	6	These studies discussed Internet resources on suicide, including newsgroups and mailing lists and the issue of interactive suicide notes; also discussed the impact on mental health nurses.	Both papers discussed the same three individuals (all male) who had posted a suicide note on a specific website (alt:suicide.holiday newsgroup). These cases were followed for 3 months. The 1998 paper used the case studies to understand the impact of Internet on suicidal behaviour and consider approaches to suicide prevention.	The case studies were as follows: AK – 26 years old, suicided after posting numerous messages. NW – announced his intention to suicide, no knowledge if successful or not. Nymbus – described a failed suicide attempt and urged others to reconsider suicide, particularly using carbon monoxide poisoning.	1. The newsgroup contained detailed descriptions of suicide methods. 2. Public commitment to suicide may force people to go through with the act. 3. Group death instincts – easy for self-destructive individuals to incite others to suicide 4. Socially isolated/vulnerable individuals can form influential relationships. 5. Do health professionals have an ethical obligation to intervene? 6. Anonymity decreases potential for therapeutic interaction.	There is scope for nurses to develop Internet resources to counter the nihilism of those who use it to celebrate suicide and encourage others to end their lives.
Cash <i>et al.</i> (2013)	3	This study explored the nature of suicidal statements available on MySpace.	Examined comments collected from profiles of adolescents aged between 13 and 24 years. Reduced 1038 comments to 64 over four phases using an initial coding scheme. Remaining comments were analysed using content analysis.	The majority of comments had no context and 42% were related to relationships. Adolescents may use social networking sites to reach out for help and support.	Could not ascertain whether comments received a response, or the nature or content of those responses.	Findings suggest that adolescents do use social networking sites to discuss suicidal thoughts and intentions. These sites may provide opportunities for identifying at-risk individuals.
Fekete (2002)	3	This study investigated whether suicidal people could be distinguished from non-suicidal people by their writing on a discussion forum (alt:suicide.holiday).	Compared writing styles of members of four newsgroups: (1) alt:suicide.holiday; (2) alt:support.depression; (3) alt:anxiety.panic; (4) alt:journalism. All letters posted in the newsgroups (n = 966) were analysed using thematic analysis, then a selected sample (n = 78) was analysed using detailed content analysis and the Weintraub content analytic method.	The five most frequent topics covered in the suicide group's letters were: asking for/providing support (8%); suicide models, pacts and imitation (7.5%); asking for suicide methods and information (7%); the impact of suicide on survivors and other consequences of the act (5.4%); and the role of religion (5%). Compared with the other groups, letters from the suicide group were characterized by high scores in emotional categories, low explainers, very frequent negation, high self-preoccupation, and a tendency towards polarized, dichotomous thinking.	Representativeness of the sample may be limited and the lack of information about participants (e.g. age and gender) made it difficult to draw conclusions related to these variables.	Results improve understanding of the characteristic psychopathology appearing in both the verbal and written communication of suicidal individuals. Suicidality can be better assessed and distinguished based on writing, and even speaking (i.e. on phone hotlines).
Fu <i>et al.</i> (2013)	3/2	This study examined written reactions of a group of Chinese microbloggers exposed to a wrist-cutting picture posted on social media (weibo.com); also examined pattern of information diffusion in social media network.	Systematically collected and analysed 5971 generated microblogs (using quantitative content analysis) and the network of information diffusion (using a network research software package).	Among collected microblogs, 36.6% concerned caring, showing empathy and calling for help; 23.4% evidenced a negative attitude (i.e. cynical or indifferent); 19.4% emotional presentations of shock; 20.4% reposts. The top 10 most influential bloggers who re-posted expressed concern and care. There were more user clusters in the repost network than in the random network.	Some messages expressed cynical or indifferent attitudes and some were considered cyber-bullying.	Diffusion of messages about suicidal behaviour may serve as an early identification tool and rescuing platform for at-risk individuals, or a strategy for engaging suicidal individuals. Social media may be utilized to detect at-risk individuals early. A repost network can be activated quickly in emergency situations.

TABLE 3. Continued

Study	Methodological approach	Aims	Study description	Results	Methodological limitations/ethical issues	Main benefits/successes
Gilat & Shahaar (2007)	3	This comparative study investigated the nature/content of suicidal calls received by telephonic hotlines, synchronous personal chat and an asynchronous online support group (eran.org.il).	Analysed 50% of all messages posted in online support group in 2004. Calls were coded according to: (1) age and gender of caller, (2) type of caller/visitor (first vs. recurrent); and (3) suicidal threat present or absent. There were 5753 participants across all three groups, 954 from online support group (66% female).	Suicide threats were more common among those in the online support group (15.3% vs. 0.3% in the personal chat group and 1.4% in telephone group). Suicide threats in the online support group were higher in females (18.5%) and males (17.2%) who were repeat visitors, compared with females (13.3%) and males (12.5%) who were first-time visitors.	The study did not allow suicidal individuals to seek help from online support groups.	The finding that online support groups are well used by young people highlights the need to incorporate this mode of service delivery into existing community mental health centres.
Gilat et al. (2011)	3	This study examined the response strategies adopted by volunteer moderators to suicidal messages and the relationships between the messages and types of responses on an online support group (eran.org.il).	One hundred twenty suicidal interactions between site users and volunteers were analysed. Criterion for suicidal interaction was an explicit expression of a wish for death or self-harm. One hundred twenty of 252 suicidal messages posted on the forum in 2006 were randomly selected and interactions were assessed in order to identify mental pain, cognitive attribution and level of suicide risk. Response strategies were assessed in 60 interactions and analysed using the method of 'word systems' (p. 199).	Forum volunteers employed the following response strategies: emotional support, offering group support (most used in response to acute loneliness), empowerment (used in response to messages conveying narcissistic wounds), interpretation, cognitive change inducement (used more in response to acute loneliness and cognitive attribution), persuasion (used when interactions were characterized by themes of irreversibility, emptiness and immediate suicide risk), advising (used more in response to irreversibility) and referring. These strategies were divided into three categories: emotion focused, cognitive focused and behaviour focused. Emotion- and cognitive-focused strategies were most common.	The findings may not generalize to other suicidal individuals or responders (e.g. those who do not seek support online). Authors focused on the nature of the response and did not follow up on the effectiveness of various responses.	The strategies revealed may make a unique contribution to suicide prevention. Findings expand the applicability of Action Theory to suicide prevention. Specifically, support group moderated by volunteers afforded conditions that promoted adaptive interpersonal processes and might be used for suicide prevention.
Gilat et al. (2012)	3	This study compared the nature of responses employed by lay individuals and trained volunteers when delivering emotional first aid on an online forum (eran.org.il).	One hundred eleven suicidal interactions between individuals and either trained volunteers or lay individuals were analysed and compared on the types of response strategies they employed. Each interaction contained one suicidal message and two responses (one volunteer, one lay); the first response in each interaction was analysed. Suicidal posters were 53 females, 37 males and 21 people whose gender was unspecified. Of the 55 volunteers, 68% were female and mean age was 52 (SD = 10.6). Characteristics of lay individuals were not reported.	Trained volunteers employed emotional support, empowerment, interpretation and cognitive change inducement more frequently than lay individuals. Lay individuals used self-disclosure more frequently, and volunteers used it rarely.	The authors were not able to assess the effectiveness of various responses as the study focused only on the nature of the interaction without following up on the outcome with site users.	Findings reveal volunteers can play a complementary role to professionals. When groups are moderated by trained volunteers, they can reduce risks and increase preventative power of the group. Both lay individuals and volunteers can help.
Greidanus & Everall (2010)	3	This study examined the dialogue between users of an unspecified online support community for suicidal adolescents.	Transcripts from the message board were screened and the 10 longest threads were selected for content analysis. Because of anonymity, age and gender of users and member number were unknown.	Posters assumed role of 'author' and/or 'help-provider' and discussed suicidal ideation/behaviour as well as other issues. Emotional support was more common response than informational support. Posters emphasized the importance of expressing thoughts and feelings in a community that understood. Social support, anonymity, accessibility and access to similar peers were important. Message boards were monitored every 24 h by trained peer volunteers who offered resources and support and modelled supportive behaviour. They normalized feelings of help seekers and affirmed their character.	None reported.	Results suggest individuals may be more likely to seek and offer support in a context in which they feel safe.

TABLE 3. Continued

Study	Methodological approach	Aims	Study description	Results	Methodological limitations/ethical issues	Main benefits/successes
Horne & Wiggins (2009)	3	This study examined how participants in two unspecified forums 'work up' their authenticity in their opening posts and how these are responded to.	All messages and replies from a 4-week period in 2005 were analysed (329 posts) using discursive psychology.	Users constructed their own and others' identities as authentically suicidal, as psychologically 'on the edge', yet as rational people who are not asking for help. Participants did not set themselves up as competent to deal with their problems.	Authors suggested that forums are not necessarily a place to ask for help but a place where people go to achieve validation of their authentic status.	Findings have implications for the importance of receiving and validation identities (health professionals, phone line staff, etc.) and suggest it is important not to generalize problems.
Hsiung (2007)	3	This study described the responses of group members and a group moderator to a suicide in an online forum (http://www.drf-bob.org/babble/).	Case of a forum member who killed herself, eliciting a range of responses from the other forum members. The forum member joined the forum in February 2001 and from that time posted a large number of messages, including one about a recent suicide attempt. Other forum members expressed concern and she expressed appreciation of that. She also helped to support others. A forum member who knew her offline heard of her suicide and posted about her death on the forum.	Group response: A large number of messages were posted in response to the death. Group members expressed shock, sadness, disbelief, confirmation and denial. They supported each other and referred to the group as a 'family'. Some were angry and some expressed desire to emulate this. Overall responses were similar to those expected offline. Nobody expressed support of the suicide or reported any self-harm in response. <i>Author/moderator response:</i> The author described the challenge of wishing to acknowledge the death without sensationalizing it. Two days following the announcement, he started a memorial thread. No special announcements were made and the death was not glamorized. The moderator normalized a range of feelings, but did not offer counselling. Three months later, he set up a memorial page on an affiliated site in an attempt to facilitate mourning while reducing risk of contagion. A discussion board was later developed focusing on grief and mourning. Both the memorial thread and the page were felt to be beneficial and mimic real-life mourning. The author concludes that, when responding to a suicide, forums should have threaded asynchronous discussions or separate chat rooms, and searchable archives for people to 'work through' their grief. Memorial threads or distinct pages are useful and should follow the recommendations for print media in order to minimize contagion.	This case study described the responses of one forum and its members to a suicide, thus the results are not necessarily generalizable to other settings/forums. In addition, the author was a participant-observer and therefore may have been less objective.	The author noted the importance of website owners regulating their sites, and of not allowing the encouragement of self-harm, the posting of instructions or false reports of a suicide. Website owners should allow for self-expression and provide support and education (including resources and treatment where necessary). They should be able to obtain IP addresses in case of imminent risk. A final recommendation related to the need for additional research, including into the efficacy of interventions delivered via social media.
Ikugana et al. (2013)	3	This study examined the communication between suicidal Japanese individuals in an online discussion forum (Channel 2 Japanese Suicide Bulletin Board) in order to 'get a glimpse of their journeys' (p. 284).	Qualitative content/thematic analysis was used to analyse 307 postings (selected if they referenced suicide wish/plan or circumstances that might lead the poster to want to die). Approaches based on Schneidman's theory (p. 283).	Three types of suicide wish: ambivalent (most common), passive and group. Seventy per cent of discussants indicated unbearable psychological pain and suffering; the second most common theme was seeking connection online. Discussants benefited from discussing suicide without being ostracized. Third most common theme was interpersonal conflict, followed by negative self-view, then lack of support. Common underlying theme of lack of connection in social network.	Findings not generalizable to rest of Japanese or to Western society. Lack of demographic information. Issues regarding authenticity of posts.	More discussants used the bulletin board to seek a connection with others and to share their experiences in a positive manner than those who sought suicide partners or methods.

TABLE 3. Continued

Study	Methodological approach	Aims	Study description	Results	Methodological limitations/ethical issues	Main benefits/successes
Kupferberg & Gilat (2012)	3	This study explored how suicidal help seekers utilize language resources (i.e. rhetorical questions, repetition, pronouns and linguistic metaphors) to position themselves in relation to others in computer-mediated discourse (studied forum on eran.org.il).	One hundred thirty messages (65 suicidal and 65 non-suicidal) were analysed qualitatively and quantitatively.	Non-suicidal and suicidal participants used language resources differently. Troubled individuals who were not in a suicidal crisis attempted to maintain interpersonal relations with other forum mates and readily constructed their experience using narrative discourse. Suicidal individuals distanced themselves from direct dialogue and social involvement with other forum mates and with everyday reality and focused on the meaning of suicide.	This study retrieved data from one forum only and only a relatively small number of messages were examined. As a result, the findings may not be generalizable to users of other forums.	Evidence that language and self are closely related in meaningful ways. Can be used to further the dialogue between help seekers and volunteers.
Schotanus-Dijkstra et al. (2013)	3	This study investigated which self-help resources, grief reactions and experiences with health-care services are shared online by bereaved people. Focused on two forums for people bereaved by suicide: one in Belgium, one in Netherlands.	Up to 1250 messages posted by 165 members of two Dutch language-forums for the bereaved by suicide underwent content analysis. Members were 70% female (in 22% of cases the gender was unknown). The mean age of participants was 32. Five per cent of members had lost two to five people to suicide, mostly relatives. The forums are moderated by volunteers supervised by team of professionals.	Self-help mechanisms employed: sharing personal experiences (by far most common and more common than in other types of support forums), support or empathy, providing information or advice, universality, gratitude, requesting information or advice, creative expression, friendship, chitchat. Grief reactions: more negative (45) than positive (14%). Health-care services were not a common subject (7% of messages about positive experiences and 5% about negative experiences with health-care services).	Not known whether specific characteristics of forum participants biased results compared to those who do not use online forums, or those who use online forums but do not post messages.	Online forums may provide a place for the bereaved by suicide to talk about their experiences without fear of stigma. They can be meaningful in bereavement for at least a significant subgroup of the bereaved by suicide.
Westerlund (2013)	3	This study explored the reasons for participating in conversations about suicide, explanations, beliefs, discourses constructed, experiences shared and how boundaries are established. Based on observations of www.sjalvmord.com/chat/ .	Observed messages on a single forum over period of 3 months. Selected a series of conversations spread over 22 days, then selected the entries posted during a 2-h period on each day for analysis. These messages subjected to qualitative analysis (including elements of critical discourse analysis). Most posters were teenagers and young adults in their 20s.	Act of sharing experiences appeared to be driving force for participants seeking the forum. Usernames designed to convey point about feelings or experiences. Reasons for not wanting to live were anxiety, powerlessness, loneliness (major cause), meaninglessness and misery. Posters displayed frequent distrust and criticism of social institutions, particularly psychiatry (presented as intimidating and autocratic).	Participants practised suicidal behaviour in a mediated, conversational forum, thereby making the act seem less fearful and causing them to become more fearless in the face of performing the act. Suicide was constructed as an acceptable solution to problems.	A comforting, supporting and understanding attitude could be found in many exchanges.

TABLE 4. Studies that examined the experiences of people who use social media sites for suicide prevention purposes

Study	Methodological approach	Aims	Methodology	Participant recruitment and characteristics	Key findings	Key challenges/ethical issues and study limitations	Key benefits/strengths
Baker & Fortune (2008)	4	This study aimed to explore the accounts of young adults who engage in self-harming and suicide-related behaviours and use websites specifically dedicated to these issues.	In-depth semi-structured interviews were conducted via email, covering usage of websites and understanding of suicide and self-harm in general. Data were analysed qualitatively using Foucauldian Discourse Analysis.	Targeted recruitment strategy that involved placing advertisements on relevant websites. Ten participants (nine female, one male). Age range: 18–33. All active users of at least one self-harm and/or suicide website and regularly interacted with other website users via message boards or chat.	Three discourses identified: (1) empathetic understanding – receiving a positive/socially valued identity from the websites, being understood by others and being able to provide understanding to community/belonging – websites provided friendship, emotional support, information and advice; and (3) coping – participants described the websites as a helpful way to cope with distress. For some, they were an alternative to therapy.	Use of such sites may further marginalize users from wider society or constrain them from seeking personal or professional help offline. However, the potential negative effects of site usage were not examined.	Overall participants found the sites beneficial. The study provides an alternative to the view that these sites are 'dangerous'. Users may find them more accessible, effective and acceptable than traditional forms of treatment. Further dialogue between health professionals and people who use suicide and self-harm websites is needed.
Chapple & Ziebland (2011)	4	This study investigated how internet support may be changing the experiences of people who have been bereaved by suicide.	Forty face-to-face interviews were conducted with people living in the UK. Interviews were narrative and semi-structured and were transcribed and analysed using a qualitative interpretive approach 'combining thematic analysis with constant comparison'. (p. 177).	Participants were recruited using a snowball approach via support groups, a website, GPs, the coroner's office, the project advisory panel, a newspaper article, a local radio programme and via personal contacts. Participants were 40 people bereaved by suicide (28 female, 12 male). Age range: 27–70. Twenty-seven were identified as 'professional' and 37 were 'White British'.	Participants reported using the internet for three main reasons: (1) informing others of the death which enabled news to be spread faster, and felt less burdensome than other methods; (2) gaining support; (3) setting up online memorials. Many participants felt they had gained from hearing experiences of others. Reported benefits included anonymity, 24/7 access and a non-judgmental environment. Online support was thought to be more helpful than offline support but was not replacing it.	Some participants had heard (but not experienced) that some sites might encourage suicide, which made them afraid to use the internet. Some participants viewed face to face as more helpful than online, and some websites not helpful at all. Concerns that online support can be time consuming and 'take over' were expressed, and some content was thought to be 'depressing' (p. 182).	Using social networking sites to relay news can be less burdensome and less emotionally fraught than other methods. Online support groups were found to be very helpful and access to the internet has increased options for help and support. Very few negative experiences were reported and participants generally found the internet beneficial in terms of giving and receiving support.
Eichenberg (2008)	4	This study examined the relationship between users' motives for participating in suicide forums and the specific effects on the suicidality of these users.	An online questionnaire was posted on a frequently used German message board for suicidal people. Items assessed: (1) user characteristics; (2) usage habits; (3) perceived effects of the forum. Data were collected over a 4-week period.	An invitation to participate in the study was placed on the portal's start page and approved by the webmaster' (p. 108). Up to 164 participants (50% male), 88% under 30 years old.	Forty-five per cent visited the forum at least once per day. Eighty-one per cent did so in order to meet with people with similar problems. 62% wanted to share their problems with others. Relatively few used it to obtain information about professional help or to find a suicide partner. Suicidal ideation appeared to decrease over the time users were on the forum, although users did not always attribute this to the forum.	Generalizability of the study is limited by participants only being drawn from a single website.	Most forum users sought constructive help in the form of communication with others, and did not attempt to obtain information about suicide methods or make a suicide pact. There was no indication that participation increased suicidal ideation. Professionals need to focus attention on ways to integrate the self-help activities of suicidal internet users with professional help, online and offline.

TABLE 4. Continued

Study	Methodological approach	Aims	Methodology	Participant recruitment and characteristics	Key findings	Key challenges/ethical issues and study limitations	Key benefits/strengths
Fiegelman (2008)	4	This study examined the participation of parents bereaved by suicide in the Parents of Suicide (POS) Internet support group and to compare them to those who use face-to-face support groups.	Two surveys were administered to current members of the POS group. Their experience was compared to those who had utilized face-to-face support, reported themselves to be a survivor of suicide, and reported prior participation in a peer support group. The survey assessed grief experience, depression, family/social relationships, and the helpfulness of family or other social responses to grief.	Invited POS members to complete a brief online survey. If they provided contact details they were asked to complete a longer survey. The face-to-face group was recruited through various sources including support groups. Participants categorized as either (1) parents who participated in Internet support group for 1+ h during last 12 months and were current active participants in POS (n = 104) or (2) those who were not Internet group affiliates and who reported prior participation in a peer support group and who were not current active participants (n = 297).	Similar percentages of rural and metro residents affiliated with both forms of support, and many of the Internet group members also participated in face-to-face support. However, Internet group members displayed higher levels of depression, suicidal ideation and grief than those in the face-to-face group. They were more likely to have encountered unhelpful responses from family/friends and greater stigmatizing and/or strained responses from their social circles. Two-thirds found the most important aspect of the online group to be its 24/7 availability.	The study only included members of one support group; therefore, the findings may not be generalizable to other populations. The cross-sectional design prevented identifying the cause of grief difficulties or whether difficulties in other supportive relationships led people to seek online support or vice versa.	Contrary to concerns that are sometimes raised about the safety of anonymous social contact through the Internet, participants in this study found the Internet group to be of great benefit. Privacy and its 24/7 availability were perceived to be the most beneficial aspects, as well as providing the opportunity to help others. Online support may be necessary for this group who are more depressed, suicidal and socially isolated than face to face.
Harris et al. (2009)	4	The study examined the characteristics of individuals who go online for suicidal purposes and investigated what they do online.	An anonymous online survey was administered in order to collect data from: (1) people at risk of suicide who go online for suicide-related purposes and (2) people at risk of suicide who go online for non-suicidal purposes. The questionnaire assessed suicide-related behaviours, depressive symptoms, help seeking, perceived social support, online relationship building and online behaviour.	Participants were recruited via a Google ad, blogs, newsgroups, email and undergraduate psychology students. Up to 290 participants (68.2% female, 85.4% male). Age range: 18-71; Caucasian. Classified as suicide-risk individuals who went online for suicide-related purposes (n = 165) and suicide-risk individuals with no such experience (n = 125).	Suicide-related users spent more time online per week than controls. They were more likely to live alone, be unemployed, have no tertiary education, have a history of psychiatric treatment and were less likely to seek help from others. Reasons for going online included information, support and communication (only 1.8% about suicide methods). Open discussion forums/blogs were the most useful sites and commercial sites were perceived as least useful. Users liked communicating anonymously with similar others more than family or professionals. Most people reported feeling less alienated online and less suicidal afterwards.	Suicide-related users were less likely to seek help offline for their suicidal problems. Suicide-related Internet users preferred a person-avoidant method of solving problems which does not fit with current suicide prevention strategies. The anonymous survey method employed meant that researchers could not intervene in crisis situations.	Overall, these forums were found to be supportive and helpful. Suicidal users of the Internet appeared to prefer peer-to-peer interactions than professionally run prevention sites. Future websites developed by professionals should offer open, anonymous peer-to-peer contacts; moderation plus other forms of direct communication with users.

On a broader level, two studies examined social networking sites in order to identify suicide-related posts and then examined how these related to overall suicide rates in the respective countries.^{32,33} Together, these studies found evidence to suggest that suicide-related posts on social networking sites were significantly associated with suicide rates. For example, Jashinsky and colleagues³³ found a significant association between frequency of suicide posts on Twitter and data on actual suicide rates in the USA, while Won and colleagues³² found suicide-related posts on a Korean social networking site to be significantly associated with nationwide suicide rates. In both studies, the authors concluded that it might be feasible to use these social media platforms to monitor suicide trends, collect suicide-related data and deliver suicide prevention activities.

How do people use social media sites for suicide prevention-related purposes?

This was the largest category with 15 studies. Eleven studies examined the ways in which people used specifically designed online suicide forums,^{14,21,28,34–40} including those designed for people bereaved by suicide.⁴¹ Two studies primarily focused on the ways in which moderators responded to messages posted in the forums,^{42,43} and the final two studies examined both of these things.^{44,45}

Overall, these studies reported a range of benefits to the individual; these included the supportive atmosphere created by site moderators and other forum members, as well as the accessibility and utility of these sites.^{40–45} Benefits also included the opportunity that online environments offer individuals to talk about their feelings and experiences with similar others without being judged.^{40,41,44} Additionally, Fu and colleagues²⁸ found that the majority of responses to a wrist-cutting picture posted online contained messages that were caring, showed empathy or called for help. Only one study had an overall negative focus citing the potential dangers of contagion when communicating suicidal intent online.²¹

These studies found that suicidal and non-suicidal forum members could be distinguished on the basis of their writing style, with suicidal members more frequently distancing themselves from direct dialogue and social involvement and displaying a more depressogenic attribution style^{34,35,39}; and one found that individuals used the sites primarily to validate their suicidal identities rather than to genuinely seek help.³⁷

Finally, three studies examined the ways in which site moderators respond to forum users. Two of these examined the responses of volunteer moderators to suicidal messages posted on an online forum.^{42,43} In the first, they aimed to reveal and explore strategies used by the forum moderators when responding to suicidal posts,⁴² and in the second they compared these responses with those offered by lay individuals.⁴³ The authors found that while both moderators and lay individuals tended to offer emotional support, moderators used this technique more often. Moderators also used response strategies of empowerment, interpretation and cognitive change that were rarely used by lay individuals. In contrast, lay individuals more frequently included self-disclosure in their responses.

The last of these studies described the responses of the site moderator and group members to the suicide of an online forum member.⁴⁵ The responses were described as being similar to those expected in a real-life community, and nobody expressed support of the suicide or reported engaging in suicidal behaviour in response. The author reported facing challenges regarding how to represent the death in a way that would facilitate mourning while not sensationalizing it and hence risk causing contagion. The author recommended that online forums should have threaded asynchronous discussions or separate chat rooms, and searchable archives in order to allow people to 'work through' their grief in the event of the suicide of a forum member. Memorial threads or distinct memorial pages can be useful and should follow recommendations for print media in order to minimize contagion.

What are the experiences of people who use social media sites for suicide-related purposes?

Five studies investigated the experiences of individuals who use social media-based platforms for suicide prevention purposes either via interview or via a survey. Three of these studies focused on vulnerable individuals^{46–48} and two focused on individuals who had been bereaved by suicide.^{49,50} Three studies focused on interactive online activity in general and did not specify the particular online platforms being used^{46,48,51}; one study focused on an unnamed discussion forum for suicidal people;⁴⁷ and the final study focused on Parents of Suicide, an online support group for parents who have been bereaved by suicide.⁵²

Overall, these studies reported that people who post suicidal messages online do so for a number of reasons. Several studies identified that people use

these forums in order to gain information and to connect and share their experiences with others with similar problems, in what is perceived to be a positive, readily accessible and supportive manner.^{46–48} For example, a study by Harris, McLean, and Sheffield⁴⁸ of individuals who go online for suicide-related purposes found that 70% of these individuals used online forums and they generally found them to be supportive and useful. They also reported that individuals who went online for suicide-related purposes were less likely to seek help offline than suicide-risk individuals who did not go online for suicide-related purposes, and they were less likely to seek help offline than the comparison group.

One survey-based study found that very few users went online to find a suicide partner or information about suicide methods, and the majority reported a reduction in suicidal ideation after joining suicide forum.⁴⁷ Caution was expressed however that in some cases suicide was portrayed as a legitimate solution to one's problems and some users displayed a distrust of conventional psychiatric services and institutions.

Three studies examined the experience of using social media platforms upon individuals bereaved by suicide. Overall, these reported that participants had positive views of using online support groups, and gained considerable benefits with key factors being the ability to hear from others with similar experiences in an anonymous, non-judgmental environment.^{51,52} The availability, including the 24-h nature of the sites, was also reported as being beneficial.^{51,52} Feigelman and colleagues⁵² also reported that individuals who used an Internet support group had higher levels of depression, suicidal ideation, and grief, and were more likely to have experienced unhelpful responses from family and friends than those who used a face-to-face support group.

DISCUSSION

Key findings

This review identified 30 unique studies that had a primary focus on the ways in which social media platforms could be used for the purpose of suicide prevention. Four studies described the development of social media sites designed for suicide prevention; 6 examined the potential of social media in terms of its ability to reach or identify people at risk of suicide; 15 examined the ways in which people used social media for suicide prevention-related purposes; and 5 examined the experiences of people who had used social media sites for suicide preven-

tion purposes. No studies reported on the development of or findings from an intervention study using social media for suicide prevention purposes.

Overall, study design and quality were variable. The majority of studies included in the review were descriptive and cross-sectional in nature, and in most cases examined the utility of a single website or forum, thus limiting the generalizability of the findings from the individual studies. However, despite the limitations in terms of study design, the findings from the studies retrieved by the current review are of interest. Overall, the findings appeared to be largely positive with a number of key advantages of using social media for this purpose highlighted. These included the ability of social media platforms to reach large numbers of otherwise hard-to-engage people,²⁷ the visibility of expressions of suicidal ideation posted online, which can in turn allow others to intervene in, and potentially prevent, a suicide attempt,^{28–31} and its acceptability in terms of providing an anonymous, accessible and non-judgmental forum for sharing experiences with others and for both providing and receiving support; this was the case for both people who were suicidal themselves^{38,40,46,48} and for those who had been bereaved by suicide.^{41,51,52} Sites were generally governed by an ethical code of conduct and successfully moderated by trained volunteers who received professional supervision.^{24,36,44}

Suicidal individuals reported using these platforms to seek peer support as opposed to professional help, and very few people used the sites to seek information about suicide methods or suicide partners.^{38,40} Despite this, some concerns and challenges were raised. These included the possibility that utilizing social media platforms as opposed to offline help and support could serve to further marginalize people from mainstream society,⁴⁶ the normalizing of suicide-related behaviour as a response to one's problems,⁴⁰ difficulties controlling user behaviour and accurately assessing participants' emotional state online,^{23,24} and the possibility of contagion.²¹

Limitations

When considering the implications of these findings, certain limitations must be borne in mind. Firstly, while the search strategy employed was as thorough as possible, some studies may have been overlooked, particularly those that were not available in English.

It is also important to note that because we were interested in getting a broad understanding of all studies pertaining to social media and its potential

role in suicide prevention, no restrictions were placed on study design. While this is not unusual in reviews where evidence (in particular from randomized controlled trials, RCTs) is considered to be limited,⁴ or in research examining the potential impact of social media,¹⁷ it did mean that the nature and quality of included studies varied significantly and that developing a classification system for the studies was challenging. For example, several of the studies focused on users from a single discussion forum, thus limiting the generalizability of the study findings. Similarly, the cross-sectional nature of some of the survey-based studies prevents us from making any inferences regarding causal relationships between social media use and changes in suicide-related outcomes. However, research into the impact of social media platforms is an emerging field, with inherent methodological challenges (returned to below), therefore it was considered important to include these studies in the review as they still provide us with some indication of the potential benefits of using social media in suicide prevention.

Finally, because we were interested in examining the role of social media in suicide prevention, we only included those studies with a preventative focus. As a result, a number of studies (e.g. those that examined the relationship between social media use and suicide risk or the role of cyberbullying in suicide-related behaviour) were excluded and this may appear to give the results a more positive emphasis than would otherwise have been the case.

Implications

Despite the limitations cited above, this review highlights a number of potential benefits offered by social media platforms when it comes to suicide prevention. These primarily centre on the reach, accessibility, and non-judgmental and anonymous nature of such platforms. However, these same benefits also present numerous ethical and methodological challenges for clinicians and researchers, respectively.

In clinical terms, while the anonymous nature of social media increases its appeal among users, it makes it difficult for clinicians to conduct adequate risk assessments or to trace people considered to be at immediate risk.²³ Ethical challenges also exist in terms of duty of care, privacy and confidentiality.³⁰ These are significant challenges for clinicians and may partially explain the apparent disconnect between the ways in which young people use social media (i.e. primarily for peer-to-peer support) and

the ways in which professionals appear to use it (i.e. for the delivery of information and awareness raising).⁵³ The need for clear protocols and ethical standards for the delivery and evaluation of suicide prevention activities online has been acknowledged.^{54,55} Most of the individual sites described here were governed by ethical codes of conduct; however, work is currently underway in Australia⁵⁶ and in the USA⁵⁷ to develop detailed guidelines for the online delivery of suicide prevention activities, and their implementation will hopefully be an important step towards enhancing the safe delivery of suicide prevention initiatives using the Internet.

The findings from this review highlight the utility of social media both as an alternative to face-to-face treatment for some, and also as an adjunct to treatment for others. Therefore, if we are to fully harness the benefits afforded by social media, professionals need to work with consumers in order to better incorporate the positive aspects of social media into day-to-day clinical practice.^{36,46}

Just as above with regard to clinical practice, it is the very aspects of social media platforms that make them appealing that also present numerous methodological challenges for researchers. For example, the rapidly evolving nature, reach and anonymity of social media render the collection of reliable data almost impossible using current methodological approaches.¹⁹ More flexible and iterative approaches that promote maximum stakeholder involvement and have the capacity to produce more timely and relevant research finding methodologies are therefore required. Such approaches exist in other fields⁵⁸ and could readily be applied to suicide prevention.

Despite these challenges, social media platforms are clearly popular for seeking support for suicide-related feelings. This is not only exemplified by the studies retrieved here, but also has been previously identified by another study in which an extensive Internet search was conducted in order to detect ways in which social media platforms are being used for suicide prevention.⁵⁹ This phenomenon can also be seen in web pages such as the popular 'Coming Together to Prevent Youth Suicide' Facebook page,⁶⁰ which was established by community members in response to a group of suicides by young people and now has over 20 000 members.

There is clearly a demand for social media to be used in the prevention of suicide. The question facing professionals is how can this be done safely? Biddle and colleagues⁶¹ discussed the potential for the development of legislation governing Internet

content to minimize the amount of harmful content available. However, this may be challenging to implement and the effects would be difficult to measure. Several authors have also advocated for service providers to utilize search optimization strategies designed to boost their visibility, thus maximizing the likelihood that helpful rather than harmful sites are the first to appear in an Internet search.^{61–64} One way of doing this may be to add certain ‘meta-tags’ or keywords that people may use when searching for suicide methods, for example, to suicide prevention websites in order to increase the likelihood of retrieving a helpful site when method-related search terms are used.⁶⁴ Other initiatives include the removal of pro-suicide sites and links, and partnerships with organizations such as the Samaritans in the UK and Ireland to launch reporting systems that allow users to report concerns they have about other users who may be expressing suicidal ideation.⁶⁵

While these are positive initiatives, there is, to date, a lack of published literature evaluating their effectiveness. That there are no studies of this nature and that no intervention studies were identified by our search is disappointing but not surprising. Researchers have repeatedly reported a lack of high-quality studies that have tested the effects of interventions on suicide-related outcomes, in particular using randomized controlled designs,^{3,4,66} including online,^{19,45,67} and this was reflected in the studies included in the current review. Social media is becoming increasingly popular, particularly with young people, and there is growing evidence supporting the acceptability, efficacy and cost-effectiveness of delivering depression prevention and treatment programs online,⁶ although evidence is less conclusive in terms of the actual benefits of social media platforms.¹⁷ Applying appropriate methodologies to testing the use of social media platforms for both depression and suicide prevention purposes is therefore warranted^{17,45} and is a logical next step. Examples of interventions that could be readily tested include the dissemination of specific suicide prevention messaging either delivered universally, or to those identified as being vulnerable by the sorts of messages that they post, and/or the distribution of mobile applications designed to reduce suicide risk such as safety planning or problem-solving tools. However, this may require a move away from the traditional RCT. The feasibility of the RCT to suicide prevention has been questioned previously,⁶⁸ and this would seem to be increasingly relevant given the move towards online application of interventions.

Conclusion

While more high-quality studies are clearly needed, in particular intervention studies, the findings from this review suggest that social media platforms appear to enable people at risk of suicide to access information, support and counselling, and to share their experiences in a flexible, timely and readily accessible format. They also allow these individuals to simultaneously receive and provide support in what is perceived to be a safe and non-judgemental environment, thus enabling them to create unique and positive identities in a way that they may not otherwise have been able to do.

While the potential hazards should not be ignored, it appears that, if used carefully, social media could play an important role in suicide prevention, providing a useful adjunct to more traditional forms of treatment.

STATEMENT OF CONTRIBUTORSHIP

JR conceived the study, determined the inclusion and exclusion criteria, designed the classification system, supervised and assisted with screening and data extraction, interpreted the data and prepared the manuscript. GC developed the search strategy and ran the search. She also assisted with screening, development of the classification system, data extraction and preparation of the manuscript. EB assisted with development of the classification system, data extraction and preparation of the manuscript. SH assisted with development of the classification system, interpretation of the study findings and preparation of the manuscript. MR assisted with an earlier version of the search, screening and data extraction. She also provided comments on the manuscript. SF and HH provided assistance in the initial stages of designing the study, assisted with interpretation of the findings and provided comments on the manuscript. All authors have reviewed and are in agreement with the content of this manuscript.

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