Frequent advances in technology provide new and exciting opportunities for conducting suicide research and suicide risk assessments. However, to the authors' knowledge, best practices for using technology, specifically the Internet, to conduct research protocols involving suicide risk assessments have not been examined. In research contexts, the use of technology for research on suicidal behavior and suicide risk assessment can offer benefits relative to other forms of data collection. These advantages, which include increased validity, feasibility, and efficiency, as well as improvements in data collection and management, are presented. Considerations regarding the implementation of an online system for suicide risk assessment as well as limitations and future directions are discussed.

Web-based assessments and interventions are becoming increasingly prevalent and represent an area of growth in psychology. Given that a larger population can be reached than through traditional techniques, the use of technology is particularly advantageous for research and treatment (Kazdin & Blase, 2011). Many studies utilizing undergraduate populations have shown that suicide risk can be determined by administering self-report measures (Gutierrez, Osman, Kopper, Barrios, & Bagge, 2000). New web-based screening methods offer promise for identifying individuals at risk for suicidal behavior and encouraging them to seek resources. When at-risk college students utilize these services, they seek treatment three times more frequently than those who do not (Haas et al., 2008). Individuals with depression, anxiety, or distress who participate in web-based mental health interventions have rates of suicidal ideation as high as 53% in a general population sample (Hemelrijk, van Ballegooijen, Donker, van Straten, & Kerkhof, 2012), suggesting that online assessment of suicide risk is useful and ethically appropriate even if the study is not specific to suicidal behavior.

Research on suicidal behavior is essential for understanding a phenomenon that kills approximately 38,000 people every year in the United States of America and is the tenth leading cause of death (Murphy, Xu, & Kochanek, 2013). Worldwide, roughly one million people die by suicide every year according to the World Health Organization (2013). Research that sheds light on the etiology of suicidal behavior can reduce the societal cost of this phenomenon by informing prevention and intervention.
Unfortunately, a number of misconceptions surround suicide-related research—the most common of which is the myth that asking about suicide can exacerbate risk. In fact, empirical research has shown that asking participants about suicide does not have iatrogenic effects, but rather decreases distress among high-risk individuals (Gould et al., 2005; Reynolds, Lindenboim, Comtois, Murray, & Linehan, 2006). Studies have found that asking about suicide may have beneficial effects on mood (Rivlin, Marzano, Hawton, & Fazel, 2012), with one study reporting that the majority (50–70%) experienced an improvement in their emotional state (Biddle et al., 2013). The subset who had lowered mood (18–27%) expected their lowered mood to be transient and were still motivated to contribute to the research (Biddle et al., 2013). These results suggest that the benefits of asking about suicide outweigh the risks; however, care should be taken to identify the subset of participants who may experience distress.

Identification of high-risk individuals through suicide-related research and suicide risk assessment are related components of suicide research. Thus, the primary aims of this article are to elucidate the role of online assessment of suicide risk in research contexts, to describe some best practices for conducting such assessments, and to discuss the benefits and limitations of these practices. The practices described in this paper need not be limited to suicide-specific research and may be used in any research setting that involves assessment of suicide risk.

BENEFITS OF ONLINE METHODOLOGY SPECIFIC TO SUICIDE RESEARCH

Online methodology does not present serious disadvantages relative to traditional forms of research; the Board of Scientific Affairs of the American Psychological Association has stated the position that “Internet research is inherently no more risky than traditional observational, survey, or experimental methods” (Kraut et al., 2004, p. 105). It is important to consider the advantages to using online methodology for suicide research and risk assessments, which include increased reliability, increased feasibility or efficiency, and improvements in measurement and analysis.

Some suggest that in an attempt to avoid shame or embarrassment, individuals may underreport stigmatized behaviors in person due to the social desirability bias, which results in systematic errors in self-report data (Fisher, Pearson, Kim, & Reynolds, 2002). In suicide-related research, the effects of this error may be reduced by use of computer-based interviews (Nock, Borges, Bromet, Cha, et al., 2008), which can increase the reporting of stigmatized behaviors by two to three times relative to nonanonymous techniques (Nock, Borges, Bromet, Cha, et al., 2008).

Online methodology can increase the ease by which participants at high or imminent risk for suicide (described later in detail) are identified through near instant calculation of risk level, researchers can be automatically notified of potential high-risk individuals, and data can be downloaded for analysis. Additionally, using online research methods can improve overall measurement flexibility or accuracy, data management, and analysis. Validity items can be inserted throughout to identify and remove data for individuals who responded randomly in addition to reducing false positives when identifying genuine suicide risk.

In general, the field of psychology is increasingly using the Internet for interventions and assessment, with a key benefit being the relative ease in reaching a large segment of the population (Kazdin & Blase, 2011). In suicide-related research, online methodology lowers costs and allows more participants to be sampled, which increases statistical power (Nock, Borges, Bromet, Cha, et al., 2008). Also, specialized and diverse population segments can be reached more easily and participants sampled from more locations through the use of online methodology (Kraut et al., 2004), thereby increasing study generalizability.
BEST PRACTICES FOR ONLINE SUICIDE RISK ASSESSMENT

Although some of the benefits summarized and discussed earlier have been described elsewhere, we are not aware of an article describing the best practices for assessing suicide risk online. One goal of this article is to provide information that can be cited for institutional review board (IRB) protocols and grant proposals (see Appendix S1 for a sample protocol) to facilitate communication about adherence to best practices. This section focuses on ethical (and IRB-friendly) practices as well as overcoming logistical issues that may deter researchers from taking advantage of online methodology. A careful and thorough description of the following elements is vital for protocols involving online assessment of suicide risk: how data will be collected, how to identify and take appropriate actions for at-risk individuals, and debriefing.

Ethics

Ethical treatment of participants in suicide research is paramount, even in the absence of legal obligations (Mishara & Weissstub, 2005). A lack of clarity in communication about ethical problems in suicide research has been found to pose a formidable challenge for members of ethics committees (Lakeman & Fitzgerald, 2009).

It is recommended that suicide-related resources are discussed with all participants through general debriefing. Those involved in approving research (e.g., IRB members) can be understandably hesitant to approve suicide-related research and may be particularly hesitant to approve protocols that involve online methodology. It is the responsibility of the researcher to educate others that it is not harmful to ask about suicide. Further, it could be unethical not to ask about suicide, because individuals at risk are not identified.

This concern applies to any study involving individuals with mental disorders, as there are high rates of suicidal ideation in this population even if they only exhibit subclinical mental health symptoms (Cukrowicz et al., 2011). For example, Cukrowicz et al. have found that even if item 9 on the Beck Depression Inventory-II (BDI-II; i.e., “I would kill myself if I had the chance”) is absent, suicide risk may still need to be assessed and a lower cutoff score (moderate) on the BDI-II is recommended. Given these findings, it should be stressed that “there is no benefit to removing item 9 and it is arguably unethical to engage in such practices.” According the ethical guidelines of the American Psychological Association, “omitting troublesome observations from reports” is prohibited (2009, p. 12). Removal of this item (or, analogously, items assessing current suicidal behaviors and participant contact information) does not alter a participant’s risk status and hampers researchers’ abilities to identify at-risk individuals.

Identifying and approaching potentially high-risk research participants, as described in the next subsection, provides access to resources (such as phone numbers for crisis hotlines and community resources) for individuals who would otherwise not be identified.

Risk Identification

Participants at clinically significant risk or higher should be promptly and systematically identified and contacted in a time-sensitive manner for a detailed follow-up assessment. Following are some ethical best practices for conducting such assessments and the use of suicide risk assessment measures.

When choosing an online survey platform, the platform selected should ideally give researchers the option of making self-reported contact information items mandatory and offer risk notification options, which will ensure that researchers can identify and contact participants in the event of an emergency. Additionally, some institutions or departments may offer information technology (IT) services that
are able to design a custom online platform or adapt an existing platform (e.g., a psychology participant pool survey system).

Suicide risk notification and checking procedures should be as close to real time as possible. A quick response time mitigates risk for harm between the time of risk detection and response by the researcher for detailed assessment. We recommend text message or e-mail updates to researchers’ phones. E-mail to text message codes for most wireless carriers can be found online or by contacting one’s wireless provider. These simple codes, which use ten-digit phone numbers without dashes (e.g., 1238675309@yourwirelessprovider.com), may be added like an e-mail address to the online notification system and allow researchers to receive text messages when triggered.

Institutional review board protocols (see Appendix S2) should include a list of the individuals who will be trained and responsible for conducting suicide risk assessments and what those assessments will entail, as well as the specific online methods (e.g., text and response time to notifications) that will be used to notify researchers of risk. Division of on-call duties and limiting the times at which the survey is available may reduce burden on researchers.

Risk Assessment

Telephone assessments and detailed steps for how to conduct a risk assessment are described elsewhere (e.g., Joiner, Walker, Rudd, & Jobes, 1999; Joiner et al., 2007). Actions to take once risk is determined are also described in these sources and can be used for high-risk individuals. It should be noted that suicide hotlines also conduct suicide risk assessments over the phone, without adverse consequences (e.g., Gould, Kalafat, Harris Munfakh, & Kleinman, 2007). Specifically, telephone sessions have been found to decrease both suicidal behaviors during the course of the phone call and hopelessness and psychological pain in subsequent weeks (Gould et al., 2007). Protocols using telephone assessments should include details regarding the collection and protection of contact numbers and data. In addition to telephone assessments, high-risk participants may be contacted via e-mail and/or text message if they are unavailable for a phone call. After several attempts to contact the individual using multiple methods of communication, consideration of the suicide risk profile in consultation with colleagues, as safety and ethics permit, should occur prior to calling emergency services. The imminence of danger and status relative to suicide risk thresholds are two considerations that may contribute to decisions about whether to try establishing contact again after a reasonable amount of time or whether immediate action is required after exhausting available forms of communication. Police departments can be provided with a participant’s information in case of emergency, which may help officers track the cell signal or locate the person through other means.

The National Suicide Prevention Lifeline (2011) has developed policy guidelines for crisis centers regarding the issue of active intervention. They recommend using the least invasive intervention methods possible to establish rapport and collaborate with those at imminent suicide risk. If efforts to use less invasive methods are not effective in instances where the individual is both at imminent risk and unwilling or unable to voluntarily take measures to ensure their safety, other methods should be initiated, up to and including the use of emergency services. We reiterate the importance of emergency intervention methods if a suicide attempt is in progress.

Cut Scores for Clinically Significant Risk

Cut scores have previously been defined as “the threshold at or above which one is deemed to be positive for a symptom or disorder” (Joiner, Pfaff, & Acres, 2002, p. 476). In this context, a quantitative score at or above a cutoff indicates clinically significant suicide risk in addition to being a
criterion for the initiation of further risk assessment.

Detailed discussion of commonly used risk assessment measures may be found elsewhere (e.g., Range, 2005), although we briefly discuss several of the most commonly used measures here. A total score of at least 6 and at least one response to the following items being a “2”: 12, 13, 14, 15, 16 can be used as a cutoff for the Beck Scale for Suicide Ideation (Cukrowicz et al., 2011). A score of 3 on item B or D can be used as a cutoff for the Depressive Symptom Inventory-Suicidality Subscale (Joiner et al., 2002). In keeping with the BDI-II issue discussed in the ethics section earlier, individuals experiencing subclinical symptoms of depression may still be experiencing suicidal ideation. Thus, despite a long history of BDI ranges that should be acknowledged (Beck, Steer, & Carbin, 1988), we suggest that a score of 3 on item 9 may be a more face valid indicator for conducting a suicide risk assessment regardless of total score (i.e., someone could be classified as minimally depressed but endorse a 3 on item 9; Cukrowicz et al., 2011). In general, we recommend that cutoff scores targeting moderate levels of suicidal ideation may strike a balance between (1) the fact that most individuals who experience suicidal ideation do not attempt suicide (Nock, Borges, Bromet, Alonso, et al., 2008) and (2) the need to conduct risk assessments with individuals who may be at imminent risk for suicide. Cutoff scores should never be used alone to determine risk status, but can be a valuable adjunct to the risk assessment process (Cochrane-Brink, Lofchy, & Sakinofsky, 2000).

Consent Form

In the consent process, participants should be informed that their responses to questions about suicide will be reviewed for their safety and that if their responses indicate they may be at risk for suicide, the experimenter will contact them via phone to conduct a risk assessment and provide them with resources. Similarly, participants should be informed that if their risk for suicide is determined to be imminent and/or serious, the experimenter may (based on the specific research context) call a mobile crisis team or 911. Survey tools can be used to immediately direct high-risk participants to an outside online resource while researchers are preparing to contact them for a detailed assessment and to notify them that a researcher may contact them.

Debriefing

Given that most individuals who experience suicidal ideation do not attempt suicide (Nock, Borges, Bromet, Alonso, et al., 2008), conducting suicide risk assessments with participants who are at moderate risk for suicide would be ideal when considering balancing responsible conduct of research with feasibility. However, all participants regardless of risk status (including those at low risk with whom further risk assessments are not conducted) may be provided with mental health and suicide prevention resources during debriefing, and additional information and referrals if desired. Examples of resources to be provided include: phone numbers for university psychology clinics, counseling centers, crisis management or health services, regional or community or state crisis hotlines, and national suicide prevention hotlines (e.g., the National Suicide Prevention Lifeline: 1-800-273-TALK).

DISCUSSION

Limitations

Despite the number of benefits to conducting suicide-related research and risk assessment online, there are some potential obstacles to using online protocols. Consideration of these limitations and designing a protocol for such eventualities will ensure that best practices are being followed.
Participants may not always be available by phone for reasons ranging from being in need of emergency services to benign reasons; under these circumstances, appropriate courses of action may be ambiguous. One challenge with employing online protocols is devising a plan of action in the event that phone contact cannot be established with a potentially at-risk individual. Commonly, phone contact is prevented because participants have turned off their phone, left it somewhere, or have run out of battery. Indeed, clinical experience suggests these are primary causes for lack of phone contact. Although unanswered calls represent an inherent limitation of online protocols, this ambiguity may be reduced on the front end by requesting detailed contact information beyond the participant’s phone number, such as e-mail, or emergency contact information. At the outset, researchers may also outline the protocol that will be followed in the event that the phone call goes unanswered in the consent form. For instance, this protocol may state the number of attempts to make contact before alerting others. As suggested previously, all available information should be used to determine the level of risk, colleagues and/or supervisors consulted as appropriate, and law enforcement notified in instances where imminent danger is suspected. Situations such as these are not limited to online protocols—phone call check-ins are frequently unanswered in clinical settings, and should not be viewed as an impediment to the use of online protocols for research.

Online protocols are also limited by their technical and complex nature, which may increase the margin for error and limit researchers who have less experience with technology. For instance, creating automated risk notifications may require detailed knowledge of a given survey program and slight errors in the coding of the online protocol for data collection and risk assessment could result in missed risk notifications. Fortunately, many survey programs are equipped with elaborate manuals and access to experts who can provide additional assistance. In an effort to reduce the impact of this limitation, walk-through materials for commonly used survey platforms are available upon request from the corresponding author of this manuscript. Technology also facilitates the reuse of questionnaire survey templates; however, we caution that this may lead to the magnification of potential mistakes across multiple studies. Moreover, it may be unclear if the online use of some research measures falls under copyright fair use. Consulting with a legal adviser may be worthwhile in ambiguous cases.

Furthermore, although online protocols can offer a greater number of participants compared to other methods, there may be a lower response rate. If nonresponse is unequal among conditions, a low response rate may give rise to sampling biases or influence the accuracy of results (Holbrook, Krosnick, & Pfent, 2008). Additionally, although more diverse samples can be obtained, Internet research necessarily excludes those who do not have Internet access, which may particularly affect studies interested in low income or rural populations.

**Future Directions**

Much of this article has been framed within the context of how current technology enables us to conduct research and suicide risk assessments online, but as technology undoubtedly continues to evolve, it will provide us with new and promising possibilities related to suicide prevention. According to empirical findings, people may disclose more suicidal behavior in online support groups than over the phone or through online personal chats (Gilat & Shahar, 2007). The increasing use of technology may allow hotlines and crisis centers to increase the effectiveness of the services they provide through such technology.

Additionally, new technology will create opportunities for professionals to collaborate with companies that facilitate the
flow of information globally. For example, Apple’s Siri application has been recently updated so that anyone searching for information about suicide will be provided with information about local crisis centers and prompted to call the National Suicide Prevention Lifeline (Bosker, 2013). Similar efforts have been undertaken by Facebook—their automated computer-supplied crisis intervention has been referred to as “hard-wired compassion” (Milian, 2011). Google has changed their search results to display an image of a red telephone alongside a crisis hotline number for suicide-related searches (Milian, 2011). These efforts suggest that there will be increasing opportunities for both online suicide prevention and online suicide research. Burgeoning efforts to identify suicide risk on the Web indicate that online protocols will play an increasingly greater role in suicide prevention and research.

REFERENCES


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**SUPPORTING INFORMATION**

Additional Supporting Information may be found in the online version of this article:

**Appendix S1** How to identify at-risk individuals using online methodology.

**Appendix S2** How to assess individuals identified as at-risk.