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Evaluation of the Safety and Design of Community Internet Resources for Veteran Suicide Prevention

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Abstract

Background: Recent data show many veterans who die by suicide are not currently engaged in mental health care. Veterans frequently use the Internet for health information and may look online for community resources when in distress. However, little is known about their design characteristics.

Aim: To evaluate the design and content of community, veteran suicide prevention websites.

Method: Community websites focused on veteran suicide prevention were gathered through Internet searches using standardized search terms. Websites that met the inclusion criteria ($n = 9$) were evaluated for adherence to suicide safe messaging, usability, readability, and credibility heuristics. Interrater reliability was evaluated using kappa statistics. Descriptive statistics were used to describe website features.

Results: Community websites tended to provide help-seeking information, safe messaging, and community activities. However, no websites provided information on lethal means safety or references to signal credibility.

Limitations: The sample was small and only included English-language websites, and focused on veteran-oriented, community websites.

Conclusion: Community suicide prevention websites focused on veterans could be improved through increased readability, credibility, and provision of lethal means safety information.

Keywords

suicide; Internet; veterans; community; messaging

Veterans are at elevated risk of death by suicide compared with civilians, and suicide rates have not decreased over the past several years (Office of Mental Health & Suicide

Prevention, 2016; OMHSP). The majority of veterans who die by suicide are not currently enrolled in Veterans Health Administration (VHA) care (Office of Mental Health & Suicide Prevention, 2016). On the basis of these data, the VHA OMHSP has identified community-based approaches as priority areas to reach at-risk veterans (Hersher, 2017).

Common barriers to treatment for suicidal ideation include lack of resources, beliefs (e.g., treatment does not work), and stigma (Clement et al., 2014). Thanks to near-ubiquitous access to the Internet, online mediums have potential to mitigate barriers (Witt et al., 2017). For example, user preferences for help-seeking after publicized suicides include information and facilitation of help-seeking (Frost, Casey, & Rando, 2015). Of particular interest is lethal means safety: a set of strategies for limiting access to common suicide means (e.g., firearms, medications) to decrease risk (Yip et al., 2012). Community websites may be important for disseminating such information, as supportive others are frequently involved in means safety.

Like other populations, veterans prefer to receive health information via websites (Fleming, Crawford, Calhoun, Kudler, & Straits-Troster, 2016). For veterans not enrolled in VHA care especially, the majority (69%) endorse daily Internet use for finding health information (Tsai & Rosenheck, 2012). Therefore, veterans may be interested in seeking veteran-oriented, community suicide prevention information.

Website Content

While community websites increase access to resources for veterans not engaged in VHA care, the content might present unnecessary risks through misinformation or inappropriate reporting of suicide. Research suggests inappropriate reporting can contribute to suicide contagion within a social network (Gould, Jamieson, & Romer, 2003). To address this, organizations have developed information design standards, known as safe messaging, focused on encouraging content that decreases suicide contagion and stigma such as not including graphic details of suicide deaths (National Action Alliance for Suicide Prevention: Research Prioritization Task Force, 2014).

Another set of design guidelines focuses on the user experience as they engage with information:

- *Usability* is the extent that content is pleasing, easy to use, and relevant (Nielsen, 1994a). Prior work finds users abandon eHealth services that are difficult to use (Chiu & Eysenbach, 2010). Despite this, little research has examined the usability of online suicide prevention content.
- *Plain language* aims to reduce cognitive effort as consumers read health texts (The Plain Language Action and Information Network, 2017). Key components of readability include ease of reading and organization. Prior research reports that health information written for psychiatric patients is generally at the college level or above (Gratton, Sher, & Lopez, 2010). Lower literacy levels can negatively impact health literacy and veterans' ability to use website information (Pleasant, 2014). Studies show over 50% of veterans had marginal-to-low health

literacy and read below their highest grade level (Rodríguez et al., 2013). However, to date, suicide prevention community communications have not been evaluated for readability.

- *Credibility* is the extent that information is accurate and reliable. Prior research suggests consumers have difficulty assessing health information accuracy (Ivanitskaya, O'Boyle, & Casey, 2006).

This study's goal was to evaluate the design characteristics of community, veteran-focused suicide prevention websites. We adopted a cross-disciplinary approach to information design to examine websites in terms of content, information design, and quality characteristics.

Method

We conducted a content analysis of community websites to better understand the quality of veteran-focused, suicide prevention information presented by non-VHA community groups. We aimed to identify the extent that community websites adhered to safe messaging guidelines, credibility, and readability heuristics.

Website Sample

Veteran-focused, community websites were identified by first gathering terms that one might encounter when searching online for suicide-related information. We only included websites within the United States owing to our interest in resources for American military veterans. We recorded each string of words provided by the autofill feature and supplemented these terms with inclusion/exclusion criteria from previous research (McClellan, Ali, Mutter, Kroutil, & Landwehr, 2017; Nelson et al., 2017). We searched each string set in three search engines (Google, Bing, and Yahoo) over a 1-week period in August 2017, recording a hyperlink of each website within the first page of search results and creating a PDF of each page. In total, 122 unique websites were located and archived (see Appendix).

Two staff members evaluated each website using these inclusion criteria: (a) it was community-based (i.e., hosted by a community organization); (b) the organization was a non-health-care organization; (c) content was primarily meant to reach a veteran or veteran family audience; and (d) the stated website mission had an explicit focus on suicide prevention. We excluded government and military websites. We also excluded news media, such as articles and blogs. A total of nine websites met our criteria (see Table 1).

Conceptual Models and Coding Manual Development

Conceptually, we approached the information design of suicide prevention websites in terms of safe messaging, lethal means safety, and user experience guidelines (e.g., usability; Table 2). Our coding structure was developed a priori from guidelines on the aforementioned components.

Safe Messaging—Coding guidelines were drawn from Action Alliance (2014) and TEAM UP (2017): Examples include avoiding detailed information regarding deaths and emphasizing hope (Table 3). We also coded the specific types of help-seeking resources provided by each site.

Lethal Means Safety—Coding guidelines included any content associated with limiting access to lethal means. Any education, facts, or other resources on means safety was coded as the presence of lethal means safety information.

Usability Guidelines—We examined subdomains of web usability heuristics: jargon, logical information display, consistency, and esthetics (Loranger, 2017; Nielsen, 1994a).

Plain Language Guidelines—Design metrics were used to examine adherence to plain language guidelines. We assessed ease of reading using the Flesch–Kincaid Grade Level Formula (Kincaid, Fishburne Jr., Rogers, & Chissom, 1975) as well as average sentence length, paragraph length, logical information order, and use of active voice to account for the cognitive demands of health information (The Plain Language Action and Information Network, 2017).

Credibility Guidelines—We examined content credibility using the following metrics: absence of advertising, disclosed sponsorship, medical disclaimers, author names and qualifications, updated information, and contact information (Freeman & Spyridakis, 2004).

Coder Training and Coding

Coders (S.A. and N.A.) received individualized training on the use of the codebook by a usability specialist. They reviewed landing pages and extended one link-level out (no more than one click away from the homepage) for coding. We went no further than one link-level out because the majority of users do not expand beyond two pages from the landing page (Crutzen, Roosjen, & Poelman, 2013). They marked *present* or *absent* in a data sheet for coding elements and recorded observations to contextualize the data. To calculate readability, coders used a minimum two paragraphs worth of text from each page with the spell check/grammar function in Microsoft Word.

Kappa statistics were used to evaluate interrater reliability, and we followed extent guidelines for interpreting kappa values (Cohen, 1968). For detected discrepancies, senior study staff (J.C. and G.M.) resolved each through consensus. Coders exhibited substantial agreement ($\kappa = .67$, 82.7% agreement).

Results

Website Sample Description

All nine websites were hosted by 501(c)(3) not-for-profit organizations (i.e., a tax-exempt, charitable organization or private foundation; see Table 1). A list of websites is not provided as we did not wish to negatively impact community efforts. Six websites were started by veterans and tailored to what the organization perceived as integral to veteran mental health and well-being. Three were special interest groups within national-level organizations. Eight of the sites targeted veterans and their families; the final website only targeted veterans. Two websites included the general population as their audience. National-level organizations had more users than volunteer-oriented ones (Serpstat, 2018).

The most common stated mission was to provide a social support network by facilitating social connections, providing information, physical resources, and emotional supports. One site framed their mission as “bridging the gap” between veterans and their communities. Other sites aimed to “increase awareness” of suicide and posttraumatic stress disorder (PTSD).

Owing to the sample size, we were unable to test for statistical differences between organization types. Qualitatively, veteran-led organizations more frequently mentioned benefits assistance, peer support, and physical needs. They also had more safe reporting violations. Charitable and volunteering-oriented organizations more frequently described awareness activities. Charitable organizations more often mentioned direct support for physical needs. Community, national, and volunteer-oriented organizations appeared to have greater adherence to safe messaging guidelines.

Website Content

Safe Messaging—Six websites followed safe reporting guidelines (Table 1 and Table 3). Nonadherent websites generally had fewer monthly users and were not affiliated with a national-level organization. Stigmatizing/unsafe language was a common issue (e.g., “the suicide attempt was unsuccessful”). Websites also showed oversimplified suicide information such as equating PTSD with suicide risk. Nonadherent websites frequently displayed stereotypical images such as individuals clutching their heads or pointing weapons at themselves. Some websites provided details regarding suicide deaths including suicide notes.

Informational Topics and Services—All websites provided help-seeking information that generally consisted of a crisis line. All but one offered specific support. The most common support focused on awareness activities (e.g., suicide prevention-oriented walks). Several websites provided information on connection-oriented activities (e.g., sports teams). For physical needs, some provided consultation or direct support for housing and nutrition. Few websites offered links to peer support, direct clinical services, educational/vocational support, clinical referrals, benefits support, or in-person support groups. Some provided referrals to non-evidence-based treatments (e.g., hyperbaric oxygen treatment).

Lethal Means Safety—No websites provided information on lethal means safety.

Usability Metrics—Most websites conformed to usability heuristics in terms of information being organized in a consistent manner, mini-malist design, and clear navigation.

Plain Language Metrics—With regard to readability, the website ease of reading score ranged throughout the sample. Six sites contained text that scored as “difficult to read” via the Flesch ease of reading metric (i.e., college student). Two sites were “fairly difficult” (i.e., high school senior), and the final site scored “very difficult to read” (i.e., college graduate). Average reading grade level across all sites was 11.52 ($SD = 2.31$). Eight websites used headers to organize information. All predominantly used the active voice.

Credibility Metrics—One third of sites explicitly stated disclaimers such as: “This information is not a substitute for medical services.” Eight out of nine websites provided information about suicide prevention, but none listed authors of their content or their qualifications. Across metrics, the proportion of any usability violation (i.e., credibility, plain language, usability) appeared similar across websites.

Discussion

Overall, community websites appear to support a broad range of services and emphasize help-seeking as an important part of suicide prevention. Simultaneously, some websites had features that may adversely impact veterans seeking suicide prevention information in crisis. Interestingly, there were only nine community suicide prevention websites based on our inclusion criteria. Websites had a wide range of number of monthly users, although national-level organizations were among the most well-known websites for veteran suicide prevention.

Several websites demonstrated nonadherence to safe messaging guidelines. Our findings were similar to past research showing frequent use of stigmatizing images among non-veteran-oriented suicide prevention websites (Singaravelu, Stewart, Adams, Simkin, & Hawton, 2015). Providing details regarding deaths by suicide and depicting suicide-related behaviors are of particular concern owing to the association between these practices and markers of increased suicide risk (Ayers, Althouse, Leas, Dredze, & Allem, 2017). Community groups may be unaware of the potential harm of sharing suicide details. By better understanding community organizations’ intentions, dissemination strategies can be tailored to address specific challenges organizations face with implementing safe messaging guidelines. For example, if an organization values online memorials for finding connection with others (Bell, Bailey, & Kennedy, 2015), educational material may be adapted prior to dissemination to provide ways to remember lost loved ones without violating guidelines (e.g., excluding suicide methods).

Unexpectedly, no websites provided information on lethal means safety. This is of concern as means safety counseling has been identified as an important component of decreasing suicide risk (for review, see Yip et al., 2012). However, research shows significant barriers to implementing counseling, such as wariness regarding discussing firearms and feeling health-care providers lack cultural competence regarding firearms-related issues (Knoepke et al., 2017). Community organizations may be well-suited to support lethal means safety owing to their experience with veteran culture.

Past research shows veterans seeking informal support services are often interested in additional educational/ vocational support, benefits assistance, and peer support (Sayer et al., 2010; Whealin, Seibert-Hatalsky, Howell, & Tsai, 2015). However, few community websites provided information about these services, suggesting that websites are not currently meeting veteran needs. A possible resolution is expanding offerings to increase veteran engagement with suicide prevention resources.

Our findings indicate that all websites conformed to many esthetic design principles that facilitate browsing. However, readability scores for most sites were above the suggested readability level for websites (6th–8th grade). While all veterans will have completed high school, the incidence of traumatic brain injury and PTSD might impact reading comprehension (Capó-Aponte, Urosevich, Temme, Tarbett, & Sanghera, 2012; Resnik & Allen, 2007). When designing for all audiences, it is beneficial to consider possible needs of such audiences when introducing technical material.

Credibility heuristics were violated in the websites reviewed. The most common violation was websites using a combination of media reporting and undocumented “facts” in presenting the prevalence of suicide and solutions to combat the issue. For example, websites had clinical referrals to non-evidenced-based treatments that may result in harm such as hyperbaric oxygen therapy, which has inconsistent evidence for improving mental health symptoms (Miller, et al., 2015). Increased awareness of the impact of website credibility on veteran engagement and the potential harm of promoting treatments with limited evidence is needed.

In light of the current results, clinicians and prevention specialists should consider active outreach to support community suicide prevention efforts. Collaborations with local VHA Suicide Prevention Coordinators, clinicians who provide specialized care for veterans at high risk of suicide, may facilitate communication and training to enhance community capacity. Research shows that training on safe messaging is effective for decreasing nonadherence (Bohanna & Wang, 2012). Increasing adherence may be especially important, as individuals who seek information online about suicide report higher levels of risk and may be especially vulnerable to triggering content (Niederkrotenthaler, Haider, Till, Mok, & Pirkis, 2016). Clinicians should consider collaborating with community groups to learn more about specific barriers and facilitators to safe messaging (Trickett et al., 2011). Similar strategies may be helpful for addressing issues related to expanding services provision, promoting evidence-based practices, promoting lethal means safety, and supporting usability.

Limitations

This project has several limitations that should be taken into account. First, our website list focused on veteran-centered, community organizations. Future research could include websites created by health-care and government organizations and examine content on social media platforms (e.g., Tumblr). A second limitation consisted of the cross-sectional analysis of web content. Substantial efforts were made to ensure the collection of websites was systematic and replicable, but it is possible that some websites were not captured. Additionally, owing to the fluidity of the Internet, other newly published sites may have met our criteria. As we only coded the landing page and extended one link-level out, our evaluation of the websites may not have captured all the information present through additional links. We also do not have information on whether website users were veterans and cannot comment on the degree of reach among veteran populations.

Future Directions

Community websites may be important for reaching veterans interested in mental health care but not engaged in treatment. Additional work is needed on optimal strategies to disseminate evidence-based safety and usability design considerations to community suicide prevention organizations. Furthermore, it remains unclear how veterans react to content presented in these websites. Future studies should explore veteran reactions and how frequently they seek community websites for support. Additional evaluation of government and publicly funded sites may also inform prevention efforts. Furthermore, more exploration is required concerning how veterans perceive and utilize informal, online and in-person support, and suicide prevention mobile applications .

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Appendix

Website Search Strategy

Search terms: suicide hotline, suicide prevention, suicide attempt, commit suicide, suicidal, thinking about suicide, suicidal veteran help, how to help a suicidal veteran, suicidal veterans, help for suicidal veterans, how can I help suicidal veterans, veteran suicide, veteran suicide prevention, veteran suicide hotline, suicidal ideation, self-harm.

Biographies

Dr. Chen is an assistant professor of psychiatry at Oregon Health & Science University and Research Fellow at the VA Health Services Research & Development (VA HSR&D) Center to Improve Veteran Involvement in Care (CIVIC), OR, USA. His research interests include intervention development for high-risk populations and veteran suicide prevention.

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Dr. Teo is a core investigator at the VA Health Services Research & Development Center to Improve Veteran Involvement in Care (CIVIC) and Associate Professor of Psychiatry at the Oregon Health & Science University, OR, USA. His research focuses on understanding social factors that impact depression and suicide.

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Table 1

Characteristics of Websites That Met Inclusion Criteria (n=9)

Website	Organization Type	Veteran-Created?	Monthly Users	Safe Messaging ^a	Usability ^b
A	Community, national organization	No	4,464	0	33
B	Charitable	Yes	3,232	50	22
C	Startup Corporation	Yes	5,138	50	28
D	Volunteer-oriented	Yes	12,926	0	33
E	Volunteer-oriented	Yes	230,647	0	39
F	Volunteer-oriented	Yes	400	50	39
G	Community, national organization	No	2,429,138	0	33
H	Charitable	Yes	12,802	0	33
I	Community, national organization	No	891,269	0	44

^aIndicates percentage of violations for adherence to safe messaging guidelines.

^bIndicates percentage of violations for adherence to usability, Plain Language, and credibility metrics.

Table 2.

Suicide prevention website information design codes

Theme (subtheme)	Definition
Suicide prevention and media	
Help-seeking content	Website provides positive stories of recovery, resources such as crisis lines, and emphasizes prevention and help-seeking.
Safe reporting guidelines	Website avoids focusing solely on the extent and consequences of suicide. Does not overdramatize event, avoids details on methods/location, and does not oversimplify causes of suicide.
Lethal means safety	Website emphasizes restricting access to suicide means.
Media appeals	Website presents stories meant to persuade through emotion or inform the reader.
Community integration	
Organizational connection	Organization is a part of a larger organization or is affiliated with a larger organization.
Social media outlet	Website has a presence on social media to connect with audiences.
Community services and support	Organization presents community services or services to veterans (e.g., housing, support groups)
Plain language characteristics	
Jargon	Website does not use specialized language that an average adult could not understand.
Logical order	Information is presented in a way that facilitates understanding and action (e.g., logical categories).
Consistency	Authors use consistent markers to orientate readers, such as headers and word choice.
Credibility characteristics	
Credibility markers	Website signals the information has been vetted, is accurate, current, and originates from a reputable source (e.g., medical disclaimers, author names).
Usability characteristics	
Esthetics	Website is pleasing to the eye without distractions.
Clear navigation	Website is intuitive to navigate with relevant links that are easily understandable.

Table 3.

Summary characteristics of community suicide prevention websites

Coding domain and category	<i>n</i>	%
Suicide prevention and media		
Help-seeking information	9	100
Safe reporting adherence	6	67
Lethal means safety	0	0
Informational content	8	89
Emotional stories	1	11
Plain language characteristics		
Jargon	0	0
Logical order	8	89
Consistency	9	100
Credibility characteristics		
Advertising from other organizations	2	22
Disclose sponsorship	3	33
Medical disclaimers	3	33
Display author names	0	0
Author qualifications	0	0
References for information	0	0
Date created or updated	7	78
Contact info	9	100
Multimedia	9	100
Community integration		
Raises awareness	5	56
Provides social connection	3	33
Education/vocational services	1	11
Access to benefits	2	22
Access to physical needs (e.g., food)	3	33
Online-based support	1	11
In-person support groups	0	0
Direct clinical services	1	11
Peer support	2	22
Clinical referrals	2	22
Within an umbrella organization	1	11
Partnerships	6	67
Social media presence	9	100
Usability characteristics		
Clear navigation	9	100
High esthetics	9	100