

IMPROVING THE ACCESSIBILITY AND REACH OF MENTAL
HEALTH RESOURCES FOR SUICIDE AND NON-SUICIDAL SELF-
INJURY

by

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In response to increasing prevalence rates of suicide and non-suicidal self-injury (NSSI) in the United States, researchers have developed online mental health resources (e.g., fact sheets) to address barriers preventing those in need from receiving mental health information and care. To identify potential strategies to increase the accessibility, actionability, and reach of those resources, this study (1) determined the audiences that online suicide and NSSI resources are written for, (2) evaluated the extent to which those resources include evidence-based prevention strategies, (3) characterized how resources communicate information about suicide and NSSI, and (4) determined whether resource characteristics predicted participants' ratings of the resource. Undergraduate students ($N = 366$; 68% White) rated subsets of 59 suicide and NSSI resources for personal relevance, understandability, usability, approval, and likelihood of recommending that online resource. The resources were coded for specified audience demographics, evidence-based prevention strategies, and communication techniques. Results from linear regression analyses indicated that specified audience demographics (e.g., youth, adults), prevention strategies (i.e., support networking), and communication techniques (i.e., tone) featured in resources predicted recommendation and approval ratings. Findings from this research can inform the development of more accessible, actionable, and far-reaching mental health resources for individuals with suicidal ideation and NSSI.

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Introduction

Suicide and non-suicidal self-injury (NSSI)¹ are major public health concerns. Over the past two decades, suicide rates increased by approximately 36% (CDC, 2023b), and rates of nonfatal self-injury² increased by approximately 29% (CDC, 2023c). There was also a 42% increase in emergency department visits for nonfatal self-injury for people older than 10 years old from 2001-2016 (Zwald et al., 2020). In 2021, suicide increased to the eleventh leading cause of death overall in the United States, with 48,183 reported deaths by suicide (CDC, 2023a). Without active prevention and intervention efforts, suicide and NSSI will continue to affect society, and if current trends persist, the rates will continue to increase.

One important approach for preventing suicide and NSSI is to improve public knowledge of signs of suicidal ideation and self-injury, self-help and coping strategies, and available treatments through the dissemination of psychological research. Using the Distillation and Matching Model (DMM), Chorpita and colleagues (2005) synthesized psychological research on suicide and NSSI prevention. The three most common evidence-based prevention strategies for suicide are crisis management, psychoeducation, and support networking (PracticeWise, 2024). Crisis management supports recovery from an emergency by managing safety and coping with immediate stressors through awareness of stressors and identification of resources (PracticeWise, 2024). Psychoeducation provides information about mental illness and available treatments to promote awareness, cope with illness, and reduce relapse (PracticeWise, 2024; Srivastava & Panday, 2016; Zhao et al., 2015). Support networking increases access to resources and social support to help with coping (PracticeWise, 2024). Information about these prevention strategies

¹ Non-suicidal self-injury is the intentional self-inflicted destruction of body tissue without suicidal intention or use as a cultural practice (Cipriano et al., 2017).

² Nonfatal self-injury refers to injury or poisoning due to a deliberate, self-inflicted act to take one's life or harm oneself (CDC, 2019).

and related psychological research are often disseminated to individuals through mental health practitioners (Herman et al., 2023). However, despite the exponentially rising number of research publications and resources, many are difficult to access, interpret, and identify as evidence-based materials (Chorpita et al., 2007; Herman et al., 2023).

Not all individuals who could benefit from suicide and NSSI resources interact with mental health practitioners. To extend the reach of mental health resources, psychological researchers have started to use direct-to-consumer (DTC) marketing. Unlike traditional dissemination efforts that aim to increase awareness by *pushing* resources through an intermediary (e.g., mental health practitioner), DTC marketing aims to *pull* consumers to resources (Becker, 2015). For example, to make psychological research more accessible and actionable, researchers have developed online mental health resources such as websites and fact sheets. In addition to being more available to the public—relative to mental health practitioners—these online mental health resources can reduce privacy concerns, as well as fear and shame related to the stigma around mental illness and help-seeking (Narayan et al., 2023).

Beyond availability, online mental health resources must also be accessible and usable. However, barriers to accessing and utilizing mental health resources—like readability and language use—persist. The Joint Commission, which accredits healthcare organizations and programs around the world, recommends that materials be written at a fifth-grade reading level (Bouteman & Miller, 2023). Despite the importance, there is no standardized threshold for readability, so both physical and online mental health resources are written at varying, and often higher than accessible, reading levels. In addition, resources may be written with complicated terminology, making it difficult for the average person to understand. Furthermore, mental health resources that are written in English only also pose language barriers to individuals who are not

proficient in English. These compounding accessibility issues contribute to low mental health literacy,³ and this inability to recognize signs of mental illness likely impedes understanding and use of coping strategies in evidence-based treatments (Jorm, 2012). Accordingly, mental health resources need to be written in plain language to combat low mental health literacy and made accessible and relevant to the diverse individuals who might benefit from mental health information.

Most psychological research studies utilize convenience sampling, resulting in samples of predominantly White undergraduate psychology students who are not representative of the human population (Heinrich et al., 2010). Accordingly, resources that synthesize this psychological research tend to be developed in English only, instead of being multilingual (Brisset et al., 2014; Stampino, 2007) and vary in relevance and accessibility to certain sociocultural groups (Narayan, 2021; Stone & Waldron, 2020). Less representation in research leads to fewer diverse resources synthesized. It is thus essential to have representative samples to understand the generalizability of research findings and enhance the broad impact of psychological research.

Relatedly, there is often an assumption that findings from psychological research—and more specifically, suicide and NSSI research—are generalizable across sociocultural groups. Current literature lacks culture-specific information about suicide, studies on intersectional factors, and guiding theories for suicide and NSSI across cultures (Chu et al., 2010). Culturally specific risk factors like cultural sanctions would better account for the sociocultural context of suicide and NSSI (Kirmayer, 2022). To improve the effectiveness of suicide and NSSI prevention, it is necessary to consider the beliefs, values, norms, practices, and customs held by

³ Mental health literacy is the knowledge and beliefs about mental illness and treatment that aid in their recognition, prevention, and management (Jorm 2012; Jung et al., 2017; Brijnath et al., 2016).

minority groups that influence suicide and NSSI behaviors (Chu et al., 2010). For example, the perception of suicide as unacceptable or amoral is a predictor of lower prevalence rates of suicide among African American/Black and Latine/Hispanic populations (Chu et al., 2010). Deriving and incorporating risk factors of suicide and NSSI provides a more comprehensive and culturally inclusive approach to current psychological research, prevention strategies, and treatment practices.

Suicide and NSSI prevention represents an important public health target that warrants further research. Understanding limitations to existing suicide and NSSI resources highlights the necessity of developing accessible resources for those in need. This study (1) determined the audiences that existing online resources for suicide and NSSI are written for, (2) evaluated the extent to which those resources include evidence-based prevention strategies, (3) characterized how resources communicate information about suicide and NSSI, and (4) determined whether resource characteristics predicted participants' ratings of personal relevance, understandability, usability, approval, and likelihood of recommending that online resource.

Methods

Data for this study were collected as part of a parent study examining free, online, evidence-based mental health resources (Herman et al., 2023).

Participants

Online mental health resources were nominated by mental health professionals ($N = 52$), who were recruited through emails to professional clinical science and practice listservs and clinical science programs accredited by the Psychological Clinical Science Accreditation System. Based on demographic data, more participants identified as women (73%) than men (27%). The sample was mostly White (77%), with relatively smaller numbers of Asian (11%) and Hispanic/Latine (10%) participants. Additionally, more than half the participants had an advanced degree, such as a master's degree (19%) or a doctorate (42%), and participants worked in clinical settings (23%), research settings (23%), or both (55%).

Resources were rated by undergraduate students at the University of Oregon ($N = 366$) who were recruited through the University of Oregon Psychology and Linguistics Human Subjects Pool. Based on self-reported demographic data, most participants identified as women (76%). Other participants identified as men (18%), nonbinary (5%), transgender (1%), and another gender (<1%). Participants were ethn racially diverse, identifying as White (68%), Latine or Hispanic (16%), Multiracial or Multiethnic (10%), Asian or Asian American (9%), African American or Black (4%), Middle Eastern or North African (1%), and Native Hawaiian or Other Pacific Islander (1%). Participants' ages ranged from 18 to 45 years old ($M = 19.27$, $SD = 2.58$). Most participants spoke English (90%) as their primary language. Of participants whose primary language was not English, the most spoken languages included Spanish (51%), Chinese/Mandarin (10%), and Vietnamese (7%). Most participants had personal or familial

experience with mental health difficulties (96%), received mental health services (96%), received formal education about mental health (93%), or worked with those who struggle with mental health (55%).

Online Mental Health Resources

A total of 403 free, online, evidence-based mental health resources were nominated and included in the parent study (Herman et al., 2023). Resources were considered evidence-based if the information was curated from a reputable source, referenced resources from peer-reviewed sources, or was consistent with current mental health information in academia and literature. Resources included informational websites such as resource pages, fact sheets, and hotlines. Assessments and mobile apps were excluded because only informational resources were sought at this time. The current study characterized 59 of the 60 resources related to suicide and NSSI; one resource was excluded because the link directed users to a different website than the original nomination.

Semi-Structured Interviews

Quantitative and qualitative data on perceptions of the relevance, helpfulness, and appeal of all 403 resources were collected through semi-structured interviews with 359 undergraduate students at the University of Oregon. Interviews were conducted by undergraduate research assistants at the University of Oregon. All interviewers were trained on interview protocol, certified by the CITI Social-Behavioral-Educational Researchers Basic Course for Human Research and IRB Training, and completed suicide protocol training on the Columbia Suicide Severity Rating Scale (C-SSRS) through the Center for Practice Innovations.

For the semi-structured interviews, participants first completed informed consent forms, indicating voluntary participation and consent for audio recording. Next, they filled out a

demographics survey including questions about their racial-ethnic identity, gender identity, age, primary language, and familiarity with mental health difficulties. Participants then viewed and interacted with 4-5 online mental health resources for 2-3 minutes per resource, identifying what they liked and disliked about each resource, and answering survey questions after each resource. Survey questions included Likert scale ratings on trust, reliability, approval, relevance, understanding, organization, and recommendation of the resource. After viewing and rating all the resources, participants were asked to rank order the resources and describe their reasoning. The current study focuses on quantitative ratings of suicide and NSSI resources.

Coding Procedure

The resources were coded by two undergraduate students at the University of Oregon. Coders met weekly to discuss code applications, resolve discrepancies, and iteratively refine the coding manual. Discrepancies were resolved through a consensus. First, the resources were coded for the intended audience demographic using seven categories (e.g., youth; see *Table 1*). Audience categories were generated by authors EK and AP after reviewing the resources. An Unspecified/General code was used to describe resources that did not specify an intended audience demographic or fit under any other codes. Additional significant audience categories found during the coding process were coded as Other and noted separately.

| Code Name | Description | Example |
|---------------------------------|---|---|
| Youth | The resource, or a section of it, is explicitly written for youth, adolescents, children, teenagers, or other similar terms. | The 988 website includes a page for “ Youth ” linked on their “Help Yourself” page. |
| Adults | The resource, or a section of it, is explicitly written for adults, people aged 18 years or older, or other similar terms. | The Wikiversity page about resources for suicidal ideation has links to NAMI, which it specifies is intended “For Kids, Teens, and Young Adults.” |
| Older Adults | The resource, or a section of it, is explicitly written for older adults, senior citizens, the elderly, or other similar terms. | The Suicide.org page with international hotlines includes a link to the section on “Elderly Suicide” in the sidebar. |
| Caregivers or Providers | The resource, or a section of it, is explicitly written for caregivers, providers, parents, family members, educators, teachers, mental health professionals, therapists, clinicians, or other similar terms. | The Suicidology.org page about resources for suicide attempt survivors and lived experience of suicide has a section for “Supports for families and friends” with guides for taking care of and talking about suicide attempts in the family. |
| Racial-Ethnic Minoritized Group | The resource, or a section of it, is explicitly written for a specified racial-ethnic minoritized group. | The Suicide Prevention Resource Center homepage has a page for suicide prevention in American Indian/Alaska Native Settings linked at the bottom |
| Other | The resource, or a section of it, is explicitly written for another specific demographic not listed above. | The ABCT fact sheet on military suicide describes suicide attempts in a military setting. |
| Unspecified/General | The resource does not specify any audience demographic and does not fit under other codes. | The Wikipedia page on self-harm provides general information about self-harm/self-injury. |

Table 1: Intended Audience Demographic Codes.

Descriptions and examples of intended audience demographic codes.

Next, the resources were coded for seven suicide and NSSI prevention strategies (e.g., psychoeducation about suicide; see *Table 2*) derived from Chorpita and colleagues' (2005) synthesis of psychological research on suicide and NSSI prevention.

| Code Name | Description | Example |
|--|--|--|
| Crisis Management | The resource, or a section of it, gives information to manage safety and cope with stressors in an emergency situation. | The Suicide Prevention Strategies page on the UNC Heels Care website has a popup and section with crisis line numbers. |
| Psychoeducation about Suicide | The resource, or a section of it, gives information about suicide. | The Suicidology.org page on facts and statistics gives general information on statistics about suicide. |
| Psychoeducation about Suicide Prevention | The resource, or a section of it, gives information about preventing suicide or treatments for addressing suicidal ideation. | The NAMI factsheet on suicide provides information about suicide prevention and treatment. |
| Psychoeducation about NSSI | The resource, or a section of it, gives information about NSSI. | The "How Does Self-Injury Change Feelings?" factsheet from the Cornell Research Program on Self-Injury and Recovery gives general information about self-injury. |
| Psychoeducation about NSSI Treatment | The resource, or a section of it, gives information about preventing NSSI or treatments for addressing NSSI. | The Crisis Text Line page on How to Deal with Self-Harm includes information to deal with and recover from self-harm. |
| Support Networking | The resource, or a section of it, gives information about accessing social/community support or shared humanity. | The "Help Yourself" page of the 988 lifeline has a support group locator, crisis lines, and stories of hope. |
| None of the Above | The resource does not fit under any other prevention strategy codes. | No resources were coded as none of the above. |

Table 2: Prevention Strategy Codes.

Descriptions and examples of prevention strategy codes.

Afterward, the resources were coded for six language and communication techniques (e.g., sociocultural factors and stigma; see *Table 3*). Categories were generated by referencing literature on readability and in consultation with an expert on communication and culture.

| Code Name | Description | Example |
|---|--|--|
| Different Languages | Is the resource translated or have a translation option? Does the resource have a non-auto-translated option or non-direct translations with specific cultural adaptations? | The White Swan Foundation homepage can be translated into multiple languages, and the content is changed to be culturally responsive with the language. |
| Naming Precision and Description Accuracy | Does the resource use precise terminology? Does the resource clearly define suicide or NSSI? Does the resource differentiate between suicidal self-injury and NSSI? | The Mental Health First Aid factsheet on NSSI guidelines uses precise, well-defined terms and differentiates between suicidal self-injury and NSSI. |
| Tone/Appropriateness | Based on seriousness of NSSI and suicide, and audience age, is the tone of the resource appropriate? | The “Who Can Help” page on the It’s Ok 2 Ask website uses a less formal tone because it is more appropriate for a younger audience. |
| Sociocultural Factors and Stigma | Does the resource mention sociocultural factors or stigma on suicide or NSSI? Is this information specific or vague and is there further elaboration on the first page? | The After a Suicide school toolkit has a section on addressing cultural diversity that discusses how to address cultural differences in suicide postvention efforts. |
| Readability (Formatting) | Is the resource easy to read based on visual appeal and organization? Does the formatting impede reading the content? | The “Understanding Self-Injury” page from The Jed Foundation uses headers, bullet points, and short paragraphs to make the page readable. |

Table 3: Language and Communication Technique Codes.

Descriptions and examples of language and communication technique codes.

SMOG Scores

Readability was calculated using the SMOG Index for maximum comprehension and best fit for health care information (Boutemen & Miller, 2023). SMOG scores were calculated using the SMOG Readability calculator on charactercalculator.com. First, text from the resources was copied onto Microsoft Word documents for cleaning. Only content information on the first page of a website or the first five pages of a PDF was copied to provide a representative sample of the resource's readability level. For PDFs with title pages, the title page *and* first five content pages were copied. This included relevant information in the sidebar if it was specific to the webpage or had links to related pages/resources. Content information on additional tabs—within the same page—was copied if there were less than 30 sentences on the first tab because the SMOG Index works best with a minimum of 30 sentences, or about 600 words (McLaughlin, 1969). To generate SMOG scores without interference from formatting, the text was cleaned by adding periods to the end of sentences with bullet points, deleting headers and subheaders, and fixing any formatting errors. After the text was cleaned, it was copied and pasted into the SMOG Readability calculator on charactercalculator.com where it automatically calculated the SMOG score and reading level.

Data Analysis

Data from ratings of resources via survey and thematic coding from the audience, prevention strategy, and language and communication codes were cleaned in R. After cleaning, data from thematic coding was combined with survey rating data in R. In this mixed-methods analysis, linear regression analyses and correlation matrices were generated. Due to the limited sample size per resource, $\alpha = .1$ was used. jamovi was used to generate the graphs and calculate descriptive statistics (e.g., mean, standard deviation, frequencies).

Results

This study characterized a subset of 59 online resources related to suicide and NSSI.

Bivariate correlations were used to examine associations among variables.

| | 1 | 2 | 3 |
|-----------------------------------|-------|-------|----|
| Support Networking Strategies (1) | -- | | |
| Tone/Appropriateness (2) | | -- | |
| Approval (3) | .096* | .067* | -- |

Table 4: Approval Correlation Matrix.

Significant p-values from bivariate correlations, marked with one asterisk for $p < .1$.

| | 1 | 2 | 3 | 4 |
|---|-------|--------|-------|----|
| Specified Audience Demographic (1) | -- | | | |
| Psychoeducation Suicide Only (2) | | -- | | |
| Psychoeducation Suicide + Treatment (3) | | | -- | |
| Likelihood to Recommend (4) | .060* | .002** | .086* | -- |

Table 5: Likelihood to Recommend Correlation Matrix.

Significant p-values from bivariate correlations, marked with one asterisk for $p < .1$ and two asterisks for $p < .05$.

Intended Audience Demographic

Most resources had a specified audience demographic ($n = 36$). Of the resources with specified audiences, many were intended for caregivers or providers ($n = 28$), other specified groups (e.g., LGBTQ+; $n = 17$), and youth ($n = 12$). Relatively fewer resources were intended for a specific racial-ethnic minoritized group ($n = 7$), adults ($n = 2$), and older adults ($n = 2$).

Intended audience demographics add up to more than the number of resources because some resources ($n = 15$) specified multiple audience demographics ($M = 1.15$, $SD = 1.36$).

Participants were more likely to recommend resources with a specified audience demographic than resources for the general public ($t(57) = 1.92$, $p = .060$; see *Figure 1*).

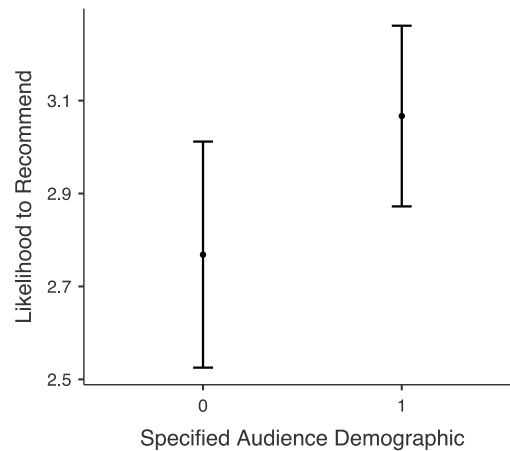


Figure 1: Correlation between an unspecified audience demographic and the likelihood of recommending the resource.

People are more likely to recommend a resource when it has a specified audience demographic rather than an unspecified audience demographic.

However, having a specified audience demographic did not impact participants' likelihood of recommending the resource, perceptions of personal relevance, or understanding. Furthermore, the number of specified audience demographics did not impact recommendation or approval.

Prevention Strategies

All resources included at least one prevention strategy, with an average of 3.29 ($SD = 1.22$) prevention strategies. The most common strategies included in suicide and NSSI resources were psychoeducation about suicide ($n = 42$), support networking ($n = 40$), and crisis management ($n = 36$). Relatively fewer resources included psychoeducation about suicide

prevention ($n = 31$), self-injury ($n = 26$), and self-injury treatment ($n = 19$). Participants were less likely to recommend resources that included psychoeducation about suicide only ($t(57) = -3.23, p = .002$; see *Figure 2*).

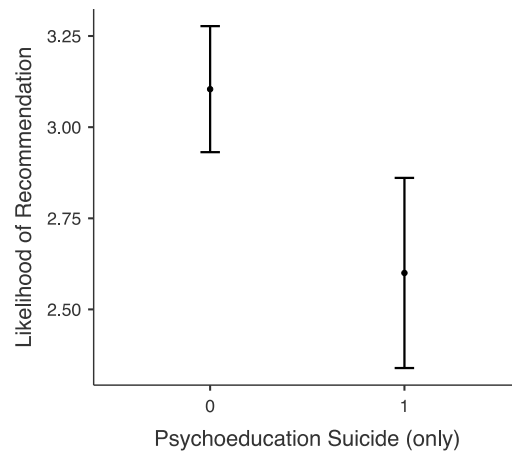


Figure 2: Correlation between psychoeducation about suicide and the likelihood of recommending the resource.

People are less likely to recommend resources that only include psychoeducation about suicide.

Furthermore, participants were more likely to recommend resources when they included psychoeducation about suicide with relevant treatment options ($t(57) = 1.75, p = .086$; see *Figure 3*). However, resources with psychoeducation about NSSI did not influence participants' likelihood of recommending the resource, whether they included psychoeducation about self-injury treatment.

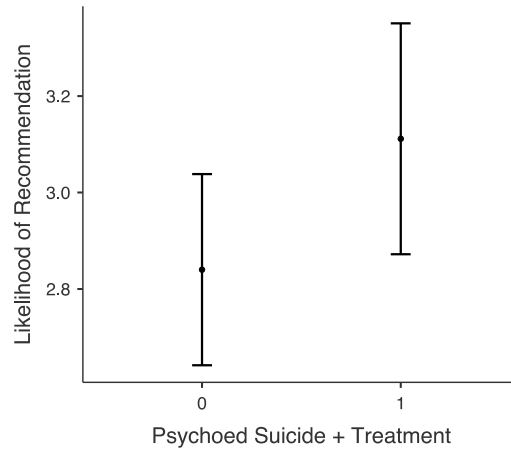


Figure 3: Correlation between psychoeducation about suicide with relevant treatment and the likelihood of recommending the resource.

People are more likely to recommend resources that include psychoeducation about suicide when it includes relevant treatment.

Participants were more likely to approve of resources that included support networking strategies ($t(57) = 1.69, p = .096$; see *Figure 4*).

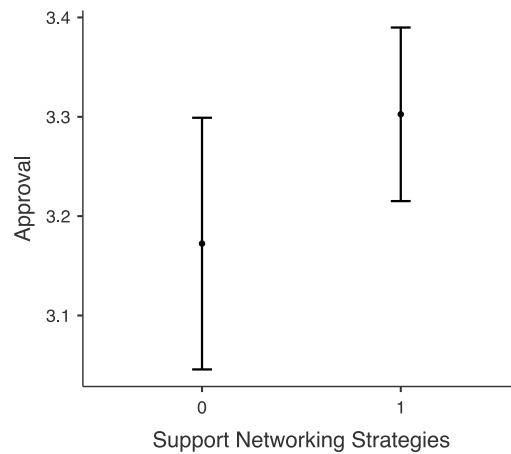


Figure 4: Correlation between support networking strategies and approval ratings of resources.

People are more likely to approve of resources that include support networking strategies.

However, participants were not more likely to recommend resources that included support networking strategies. Additionally, the use of crisis management strategies did not impact participants' likelihood of recommending or approval of the resource.

Language and Communication Techniques

Twenty-one resources were offered in a language other than English or had an option for translation. Of these resources, most had a Google Translate feature ($n = 13$). Fewer resources had non-auto translate options ($n = 7$) or non-direct translations with specific cultural adaptations ($n = 1$). Language and translation features did not impact participants' approval or likelihood of recommending resources.

Most resources included precise terminology with accurate descriptions ($n = 45$). About half of those resources clearly defined or differentiated between suicide and non-suicidal self-injury ($n = 32$), but only roughly one-fourth clearly defined *and* differentiated between those terms ($n = 13$). Terminology precision did not impact participants' understanding of resources.

Only a few resources had an inappropriate tone for the intended audience and included minimizing language or language that perpetuated stereotypes ($n = 5$). Participants were more likely to approve of resources with an inappropriate tone ($t(57) = -1.87, p = .067$; see *Figure 5*).

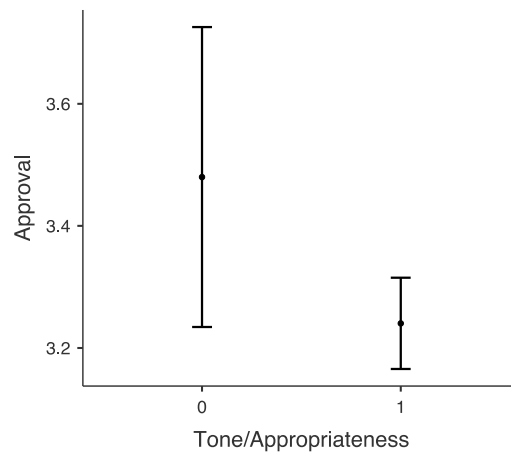


Figure 5: Correlation between tone and approval ratings of resources.

People are more likely to approve of resources when they do not have an appropriate tone.

More than half of the resources mentioned sociocultural factors or stigma or provided information about a specific racial-ethnic minoritized group ($n = 37$). Discussing sociocultural

factors and stigma did not impact participants' approval or likelihood of recommending the resources.

Most resources were characterized as readable based on formatting ($n = 51$). Most resources were also characterized as visually appealing *or* organized, with fewer characterized as both visually appealing *and* organized ($n = 15$). Resource formatting did not affect participants' perceptions of usability.

Readability was also determined by SMOG scores, which ranged from 7.10 to 17.12, corresponding with middle school to graduate reading levels (see *Figure 4*). The mean SMOG score was 12.58, corresponding with a high school reading level, with a standard deviation of 2.21. Most resources had a high school ($n = 28$) or undergraduate ($n = 26$) reading level, followed by a middle school ($n = 4$) or graduate ($n = 1$) reading level. However, the reading level did not impact participants' perceptions of complexity or understanding.

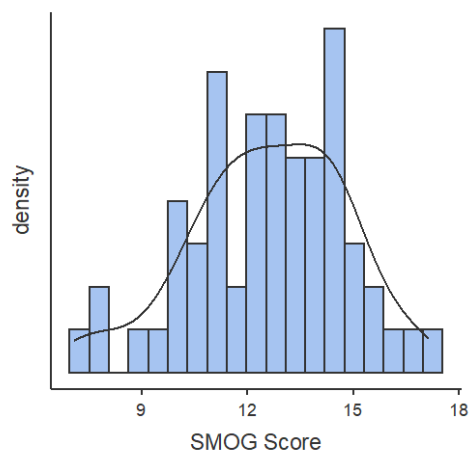


Figure 6: Distribution of SMOG ratings of resources.

Resources had readability scores that ranged from 7.10 to 17.12 with an average score of 12.58 and a standard deviation of 2.21.

Discussion

This study characterized the audience demographics suicide and NSSI resources were intended for, the inclusion of evidence-based prevention strategies, and the usage of language and communication techniques. The resource characteristics were compared with participants' ratings of approval, relevance, understanding, usability, and likelihood of recommending the resource.

Intended Audience Demographic

Most resources were intended for a specific audience demographic, not just the general public. Resources for caregivers or providers, other specified groups (e.g., LGBTQ+ and veterans), or youth were the most common, but a few resources included information for specific racial-ethnic minoritized groups, adults, and older adults. Although having a specified audience demographic did not impact participants' perceptions of personal relevance or understanding, participants were more likely to recommend resources with a specified audience demographic. Studies of targeted interventions—compared to a universal approach—demonstrate effectiveness in promoting positive outcomes for children and young people at risk of, or currently experiencing, mental health difficulties (Wolpert et al., 2013) and reducing suicide rates (Fountoulakis et al., 2011). Similarly, online mental health resources tailored for a specific demographic may increase accessibility, cultural responsiveness,⁴ and cost efficiency (Narayan et al., 2023), potentially reducing suicide and NSSI rates. Tailoring information for a specific audience demographic may make the information more relevant and better address the experiences and needs of that population.

⁴ Cultural responsiveness is described here as addressing cultural and linguistic concerns of racial-ethnic minoritized and non-minoritized groups, including psychosocial issues, characteristic styles of problem-presentation, family and immigration histories, traditions, beliefs, and values (Narayan et al., 2023).

Prevention Strategies

Every resource used one or more prevention strategies. The most used strategies were, in order, psychoeducation about suicide, support networking, and crisis management. Resources included psychoeducation about suicide more than psychoeducation about self-injury. Resources also often included psychoeducation about suicide or self-injury but did not provide psychoeducation about treatment for the relevant issue. Mental health organizations might prioritize general information over information about treatment because even just educational components may reduce self-harm, suicidal ideation, and suicidal behavior post-intervention and self-harm and suicidal behavior at follow-up (Robinson et al., 2018; Mann et al., 2021). Thus, prioritizing some general information over including specific treatment information is still beneficial.

However, resources with psychoeducation about suicide *and* relevant treatment options were more likely to be recommended than resources with only psychoeducation about suicide. This finding means that the efficacy of resources may be enhanced with psychoeducation about treatment. Describing how to access mental health treatment and what to expect, or providing information about immediate support, has been shown to reduce stigma and increase knowledge of mental health care, which encourages help-seeking behavior (Murray & Knudson, 2023). Therefore, general psychoeducation may be less likely to motivate change, but psychoeducation with treatment options may help users act on the information.

Participants were more likely to approve of resources that included support networking strategies. As an aspect of support networking, social support⁵ is a protective factor against suicide and self-injury (Kleiman & Liu, 2013; Mackin et al., 2017). It is associated with self-

⁵ Social support is measured here as the amount of perceived social interaction and support that contributes to feelings of care, love, and belonging (Forster et al., 2020; Harandi et al., 2017; Kleiman & Liu, 2013).

esteem, reduced psychological distress when faced with stressful events, and resilience to suicidal ideation (Kleiman & Liu, 2013; Harandi et al., 2017). The importance of social support in suicide and NSSI prevention may have influenced participants' higher approval ratings of resources with support networking strategies. Notably, participants noticed when resources included support networking strategies and indicated their approval within *two to three minutes*, illustrating the significance of these strategies. In addition, this may have been reinforced in resources that included stories of people of similar backgrounds going through similar mental health difficulties. Experiences of shared humanity promote representation and may help decrease stigma (Narayan et al., 2023).

Contrastingly, using crisis management strategies did not impact the approval or likelihood of recommending the resource. Providing a tangible tool—like a link to a hotline or support group—could increase awareness of crisis support and subsequent help-seeking behavior, but it needs to be easily visible for users to access crisis management information. Of the resources that included crisis management strategies, many placed the information in the top bar, sidebar, or at the bottom of the page. This placement may have made it difficult for participants to find the information, contributing to nonsignificant findings between crisis management, approval, and likelihood of recommending the resource.

Language and Communication Techniques

Less than half of the resources included information in a language besides English or had translation options. This finding is problematic because most people show a strong preference for their first language (Whitehead et al., 2023), and the language gap makes it difficult for people with limited English fluency to access mental health information and care (Narayan et al., 2023; Narayan et al., 2021; Sentell et al., 2007). Furthermore, of the resources with other-language or

translation options, Google Translate was the most common translation feature, with less than half of resources including non-auto translate or non-direct translations. However, auto-translated text may not be accurate or reliable; just because the text is auto-translated does not mean that the translation captures the meaning of the content. Direct translation can change the meaning of the sentence and may not account for differences in cultural context. To ensure cultural competency and responsiveness, the sociocultural context needs to be accounted for. However, having few culturally responsive translation options did not affect participants' approval or likelihood to recommend resources. This outcome may be because most participants were English-speaking and did not face language barriers to understanding the resources.

Most resources used precise terminology and had accurate descriptions. This finding is important because aspects of language and word choice can have a significant impact on attitudes and understanding (Till et al., 2024). As a result of framing effects, using different phrases to refer to suicide can affect users' associations and attitudes toward suicide prevention (Arendr et al., 2018). This influence means that using or emphasizing certain phrases promotes specific understanding and perspectives of the issue. About half of those resources clearly defined or differentiated between suicide and NSSI, but less than half did both. Nonetheless, the precision of terminology did not impact participants' understanding.

However, the tone of the descriptions influenced participants' approval of the resource. Only a few resources had an inappropriate tone and used minimizing language or perpetuated stereotypes. In contrast to expected findings, participants were more likely to approve of resources that did not have an appropriate tone. It is possible that, given the importance of plain language in combating low mental health literacy (Jorm, 2012), participants noted and approved of the use of more casual language even though—or even if—they noticed minimizing language

or stereotypes. If users cannot read and understand a resource, they will not be able to notice an inappropriate tone. Alternatively, participants may not have noticed inappropriate tone because they only interacted with each resource for two to three minutes. If participants interacted with the resources for a longer period and examined the text more closely, their approval ratings might have changed.

Over half of the resources discussed sociocultural factors or stigma or provided information about a specific racial-ethnic minoritized group. This is content important because people may be more receptive to resources that are culturally representative, competent, and responsive (Narayan et al., 2023; Narayan 2021; Stone & Waldron, 2020). People tend to perceive online mental health resources as not very culturally responsive, which can decrease help-seeking behavior (Narayan et al., 2023). Regardless, the inclusion of sociocultural factors and stigma did not impact participants' approval or likelihood to recommend the resources. This outcome may have happened because, of the resources that provided that information, nearly all did not elaborate further about the specific ethnic-racial minoritized on the first page. This omission is problematic because people tend to screen for relevant information when browsing on a webpage, spending no longer than 70 seconds (Liu et al., 2010). Additionally, screening is harsher on less-entertaining pages (Liu et al., 2010), like science websites or mental health resources. For people to access culturally responsive information, the material *needs* to be on the first page, or they might not notice it.

Most resources were formatted in a visually appealing or organized way, making the content visually readable. While this presentation did not affect participants' perceptions of resource usability, it might be more relevant for users who are struggling with their mental health. Cognitive slowing could make it more difficult for those users to process the information

(e.g., distinguishing text from other elements on the page and navigating using the resource interface; Stone & Waldron, 2020). Resources need to attract *and keep* users' attention. Having low visual appeal or limited interactivity decreased engagement with resources while bullet points and graphics increased it (Whitehead, 2023). It is important to consider the design and formatting of online resources to increase readability and engagement.

Within the resources, most of the text was written at a high school or undergraduate reading level. Moreover, online mental health resources for youth and the general public were written at an equally high reading level. Given low mental health literacy rates, this would make it difficult for the average person to understand information in the resource. In addition, literacy levels decline with illness (Stone & Waldron, 2020) and reading comprehension tends to be two to three grade levels below a person's level of education and established reading grade level (Skierkowski et al., 2019). However, the high reading levels did not impact participants' perceptions of resource complexity or their understanding of the resource. This finding may be due to the higher level of education and familiarity with mental health topics within the sample population of undergraduate psychology students. Although this sample did not struggle to read or understand the resources, this experience may be different for individuals with lower socioeconomic status, lower formal education, and culturally or linguistically diverse backgrounds who face more barriers.

Limitations and Future Directions

One limitation of this study is that it only included a sample of undergraduate psychology students. This sample is not representative of the human population, so findings from this study may not generalize to more diverse populations. Future research should solicit a targeted sample that includes diversity in race and ethnicity, gender, sexuality, personal familiarity with mental

health difficulties, education level, primary language, and immigration status. A culture-centered approach could also increase community collaboration beyond community-based participatory research (Dutta, 2018). Community collaboration in participant recruitment could increase the sample diversity and generalizability of research findings.

Another limitation of this study is that it had low statistical power due to a smaller sample size. Furthermore, only a subsection of participants examined each resource, which may inflate the effect size of significant results and result in type I errors. Future research should use larger sample sizes to reduce the potential for errors and increase the generalizability of findings.

In addition to sample-related limitations, the intended audience demographic and prevention strategies codes were operationalized to be more inclusive to capture more information. Coding from the resource or a *section* of it accounted for subsections or links to additional pages related to relevant audiences or prevention strategies. Future research should consider whether the quantity of information for a particular audience or about a specific topic influences viewers' perception of the intended audience.

There are also inherent limitations of the SMOG Index that make it difficult to calculate and generalize readability scores. For example, the formula is based on samples of 30 sentences, or about 600 words, which it needs to make reliable readability predictions (McLaughlin, 1969). However, some resources—like single-page PDFs or resource homepages—did not have 30 sentences, so the SMOG scores may not accurately reflect the readability of the resources. Moreover, the SMOG Index was developed in and for the English language and has not demonstrated cross-cultural validity. As more online mental health resources are created in non-English languages, new measures should be developed and tested to ensure that these resources are readable and accessible.

Conclusion

There are a lot of online resources about suicide and NSSI available, but quantity does not guarantee accessibility, relevance, or usability. Furthermore, most of these resources are not adequately accessible or culturally relevant. While people still approve of and are likely to recommend those resources, future research is needed to improve cultural responsiveness, readability, and related accessibility issues.

Appendix

Coding Manual

Coding Manual

- Please add notes for notable features of resources (e.g., warmlines, faith-based, etc.), and make note of resources that exemplify specific codes.
- Hyperlinks in a reference or bibliography section do not count as links. Links must be intentional references to additional resources, not just sources or sponsors.
 - o Links must be on the main body or sidebar within the main body of the page, not the top dropdown menu available on all pages of the website.

Audience Codes

- A section is defined as part of the resource that includes at least one paragraph with information for the specific audience code and/or ≥ 1 link to additional resources for the specific audience being coded for.
 - o If a link appears unclear, particularly if the resource would otherwise be coded as Unspecified/General, click on the link to check if it should be coded for an audience code.
- Audience codes should be applied when the resource contains information or links that could be used *by* the specific audience being coded for. The resource, or the section of it, must be written *for* the audience, not just *about* the audience.

| Audience Code | Definition | Example | Differentiation |
|---------------|--|---|--|
| Youth | The resource, or a section of it, is explicitly written for “youth,” “adolescents,” “children,” “teenagers,” or other similar terms. | A resource has a section with hotlines for teenagers. A resource includes the Trevor Project, which is a resource for LGBTQ+ youth (double code with Other). | The resource must be written <i>for</i> youth, not just <i>about</i> youth. For example, if a resource is titled “Suicide Prevention in Children” but gives information for parents, it would be coded for Parents or Family Members and <u>not</u> for Youth. |

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| Adults | The resource, or a section of it, is explicitly written for “adults,” “people aged 18 or older,” or other similar terms. | A resource has a subsection for support groups for people 18-years and older. | The resource must state that the information is for adults. If a resource does not specify an adult audience demographic, it would be coded as unspecified or general. If a resources states that it is for “young adults,” it would be coded for Adults, <u>not</u> Youth. |
| Older Adults | The resource, or a section of it, is explicitly written for “older adults,” “senior citizens,” “the elderly,” or other similar terms. | A resource includes suicide prevention strategies for senior citizens. | The resource must be specifically for <i>older</i> adults. For example, if a resource had a section for people over 21, it would be coded for Adults and <u>not</u> for Older Adults. |
| Caregivers or Providers | The resource, or a section of it is explicitly written for “caregivers,” “providers,” “parents,” “family members,” “educators,” “teachers,” “mental health professionals,” “therapists,” “clinicians,” or other similar terms. | A resource lists warning signs for parents to look for in their child. A resource has a section with training courses for therapists and mentions continuing education (CE). | The resource must be written for people in caregiving positions. For example, if a resource is written for an adult family member to support a family member who they do not care for, the resource would be coded for Adults and <u>not</u> Caregivers or Providers. |
| Specific ethnic or racial minoritized groups | The resource, or a section of it, is explicitly written for a specified ethnic or racial minoritized group. If this code is used, please specify the ethnic or racial minoritized group. | A resource is titled “Suicide Prevention for AAPI Communities.” A resource has a link to a pdf in Spanish. | The resource must be written <i>for</i> the specific ethnic or racial group and not just use strategies typically from or associated with that group. For example, “meditation resources” would <u>not</u> be coded for an Asian audience. |

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| | | | If a resource is written in another language, it <u>would</u> be coded as that specific ethnic/racial minoritized group. |
| Other | The resource, or a section of it, is explicitly written for another specific demographic not listed above. If this code is used, please specify the group (e.g., LGBTQ+, Veterans/Military). | A resource includes information for suicide prevention for people in the LGBTQ+ community. | The resource must explicitly state a specific audience demographic that does not fit with other audience codes. |
| Unspecified or General | The resource does not use terms that specify any audience demographic and does not fit under other codes. | A resource includes background information that defines self-harm. | The resource is only coded as Unspecified or General if it cannot be coded for any audience code listed above. If a resource can specify, not just imply an audience, it would <u>not</u> be coded as unspecified or general. If this code is used, it must be the only one. |

Prevention Strategy Codes

- A section is defined as part of the resource that includes at least one paragraph with information for the specific prevention strategy code and/or ≥ 1 link to additional resources for the specific strategy being coded for.
 - o Only click on a link to check if it should be coded for a prevention strategy code if it is descriptive of a prevention strategy code on the main page.

| Prevention Strategy Code | Definition | Example | Differentiation |
|-------------------------------|---|---|--|
| Crisis management | The resource, or a section of it, gives information to manage safety and cope with stressors in an emergency situation. | A resource has worksheets for a suicide prevention plan. A resource lists the national suicide hotline and crisis textline. (double-coded) | If the resource includes safety planning, it will be <u>double coded</u> with Support networking. Resources must contain actionable information about accessing crisis support. For example, a resource <u>would not</u> be coded for crisis management, but <u>would be</u> coded for psychoeducation for suicide treatment if it said emergency help can be necessary without giving an additional link to access help. |
| Psychoeducation about suicide | The resource, or a section of it, provides information about suicide | A resource gives statistics on the prevalence of suicide. | If a resource includes information on how self-injury is differentiated from suicidal behavior, it would be <u>double coded</u> with psychoeducation self-injury. |

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| Psychoeducation about treatment for suicide | The resource, or a section of it, gives information about preventing suicide or treatments for addressing suicidal ideation | A resource lists common therapy approaches for helping suicidal individuals. | The resource must give information specifically about treatment for suicide, not just general information. |
| Psychoeducation about NSSI | The resource, or a section of it, provides information about non-suicidal self-injury | A resource presents an overview of self-harm. | If a resource includes information on how self-injury is differentiated from suicidal behavior, it would be <u>double-coded</u> with psychoeducation suicide. |
| Psychoeducation about treatment for NSSI | The resource, or a section of it, gives information about preventing non-suicidal self-injury or treatments for addressing NSSI | A resource includes evidence-based interventions for self-injury. | The resource must give information specifically about treatment for self-injury, not just general information. |
| Support networking | The resource, or a section of it, provides information about shared humanity or accessing social/community support. | A resource has a section for hotlines and support groups. A resource has a video or story with a personal anecdote about their struggles and how they coped with it. | The resource will only be double-coded for Crisis management if the information provided is explicitly stated for an emergency situation. Resources must contain actionable information about accessing support. For example, a resource would <u>not</u> be coded for support networking if it just said social support is important. |
| None of the above | Crisis management, psychoeducation, or support networking are not present on the resource | A resource only includes an image. | Only use this code if no other prevention strategies are coded. If this code is used, it must be the only one. |

Language and Communication Codes

- If there is a link to an additional resource for the Social stigma and Cultural factors code, it should only be clicked on to check if it should be coded as that code.

| Language Use Code | Definition | Example | Differentiation |
|---|--|--|---|
| Different languages | 0 = English only 1 = Google Translate option or an interpreter option 2 = Non-auto translate option 3 = Non-direct/non-literal translations that include cultural adaptations of language or includes specific cultural adaptations of the resource. | 1 = A resource has a Google Translate button to switch the language of the website. 2 = A resource has non-auto translated Chinese translations of the webpage. 3 = A resource has a page redesigned for Spanish speakers with Latinx/e specific articles and resources. | To be coded as a 1 or 2 for Different Languages, the <i>whole</i> resource must be available for translation, not just a section. If the resource has language translation available <u>only</u> after login or other accessibility issues that prevent translation, it would be coded as a 0. |
| Naming precision and Description accuracy | 0 = terminology is vague, interchangeably uses NSSI and suicide, or links self-injury to suicide without further explanation 1 = terminology is precise but does <u>not</u> clearly define the terms or differentiate between suicidal self-injury 2 = terminology is precise and clearly defines the term(s) or differentiates between suicidal self-injury | 0 = A resource links all forms of self-injury to suicide. 1 = A resource uses the term self-harm but does not differentiate between NSSI. 2 = A resource states that self-injury can but is not always related to a suicide attempt. | If a resource links self-injury to suicide but differentiates between self-injury and NSSI, it would be coded as a 2. If a resource links self-injury to suicide <i>without</i> discussing NSSI, it would be coded as a 0. |

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| Tone/Appropriateness | Based on seriousness of NSSI and suicide, and audience age, is the tone of the resource appropriate? 0 = tone is not appropriate, and the resource uses minimizing language or perpetuates stereotypes 1 = tone is appropriate | 0 = A resource uses slang and minimizing language to address the seriousness of suicide and NSSI behaviors in adolescents. 0 = A resource recommends getting creative to “doodle your worries away” as a treatment for self-harm. | Slippage in the precision of terminology <u>can</u> reflect an inappropriate tone based on the context of the resource. Informal or colloquial language <i>only</i> counts as inappropriate when it is used to minimize or makes light of the seriousness of the issues. |
| Sociocultural factors and stigma | 0 = does not mention sociocultural factors or stigma in NSSI or suicide 1 = mentions sociocultural factors or stigma in NSSI or suicide nonspecifically or vaguely; or gives information about a specific ethnic/racial minoritized or sociocultural group <i>without</i> further elaboration on the first page 2 = talks about <i>specific</i> effects of stigma or includes <i>specific</i> sociocultural factors related to NSSI or suicide; or gives information about a specific ethnic/racial minoritized or sociocultural group <i>with</i> further elaboration on the first page | 1 = A resource mentions that there can be stigma in BIPOC communities around suicide. 1 = A resource has a statistic stating that LGBTQ+ individuals have a higher risk for suicide and NSSI. 2 = A resource states that Asian Americans seek less help for suicidal ideation due to cultural stigma around mental health. 2 = A resource includes culturally specific risk factors and protective factors for Indigenous youth. 2 = A resource provides information about stress related to immigration status and how it can affect suicidal ideation and NSSI. | Sociocultural factors are not limited to factors related to race or ethnicity. However, the social stigma must be associated with sociocultural factors and related to NSSI or suicide. If a resource gives statistics on a specific racial/ethnic minoritized or sociocultural group <i>without</i> elaborating on the impact of stigma or sociocultural factors, it would be coded as a 1. If a resource <i>does</i> elaborate on the impact of stigma or sociocultural factors on the statistic, it would be coded as a 2. |

| | | | |
|---------------------------------|--|---|---|
| <p>Readability (formatting)</p> | <p>Is the resource easy to read based on the two aspects of formatting, visual appeal and organization?</p> <p>Does the formatting take away from the content of the resource?</p> <p><u>Visual appeal</u>: text size, colors, background image, etc. <u>Organization</u>: text spacing/density, paragraphs vs. bullet points, headings, etc.</p> <p>0 = the resource does not meet two aspects of formatting</p> <p>1 = the resource meets one aspect of formatting</p> <p>2 = the resource meets both aspects of formatting</p> | <p>0 = A resource uses small, white font on a light gray background, making the content hard to read without highlighting.</p> <p>1 = A resource has dense, text heavy paragraphs but there are subheadings in between them.</p> <p>2 = A resource breaks up paragraphs of text with subheadings and uses bullet points to simplify things when possible.</p> | <p>This measure of readability refers specifically to the <i>formatting</i>, not the content. If the resource is hard to read because of difficult terminology, that would <u>not</u> be reflected in this code.</p> <p>If the content text is <i>only</i> included in pictures or the majority of it cannot be highlighted, it would not meet Organization requirements.</p> |
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