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Assessing Suicide Prevention Apps' Responsiveness to Help-Seeking Needs of Individuals Connected with Mental Health Services

Jessica KEMP[a,b,1], Hwayeon Danielle SHIN[a,b], Charlotte PAPE[a,b], Laura BENNETT-POYNTER[c], Samantha GROVES[c], Karen LASCELLES[c] and Gillian STRUDWICK[a,b]
[a] *Centre for Addiction and Mental Health, Toronto, Ontario, Canada*
[b] *Institute of Health Policy, Management, and Evaluation, University of Toronto, Toronto, Ontario, Canada*
[c] *Oxford Health NHS Foundation Trust, Oxford, United Kingdom*
ORCiD ID: Jessica Kemp http https://orcid.org/0000-0001-5159-4433, Hwayeon Danielle Shin https://orcid.org/0000-0003-4037-4464, Charlotte Pape https://orcid.org/0009-0007-8806-0778, Laura Bennett-Poynter https://orcid.org/0009-0002-3741-7099, Samantha Groves https://orcid.org/0000-0003-3271-7295, Karen Lascelles https://orcid.org/0000-0002-6542-4379, Gillian Strudwick https://orcid.org/0000-0002-1080-7372

Abstract. This paper maps suicide help-seeking needs identified in the literature, on to the features and functionalities of suicide prevention mobile apps using the adapted ecological model, thereby revealing existing gaps between help-seeking needs and available apps. This paper builds upon previous work by our team, which includes 1) a rapid scoping review aimed at identifying barriers and facilitators of help-seeking related to suicide within psychiatric populations, and 2) a review of suicide prevention apps, including a content analysis of app features and functionalities.

Keywords. Suicide, help-seeking, mobile health apps, digital health, mental health

1. Introduction

In Canada, there are 4,500 deaths by suicide per year, with suicide being the second leading cause of death among youth and young adults in the country [1]. Globally, suicide accounts for 700,000 deaths per year, revealing the immense burden of this public health priority [1].

Suicide attempts and self-harm significantly contribute to hospitalizations and other healthcare costs across Canada. The Centre for Addiction and Mental Health (CAMH) estimates that the economic cost of mental illness, including suicide and self-harm, in Canada is over $50 billion annually [2].

Corresponding Author: Jessica Kemp, jessica.kemp@camh.ca

The prevalence of suicide indicates a need for an improved understanding of the ways in which individuals experiencing suicidal ideation or behaviours seek help, and the existing barriers and facilitators that limit or support help-seeking in these populations. There is also a need to identify innovative solutions to support suicide prevention such as the use of mobile applications and other digital interventions, which have historically been used as an adjunct to treatment for depression, anxiety, and related disorders [3]. These considerations may contribute to reducing healthcare costs associated with suicide, help to prevent suicide-related deaths, and provide suitable mental health support that is responsive to individuals' help-seeking needs.

The purpose of this paper is to utilize the results of a rapid scoping review and mobile app store review to describe how previously identified barriers and facilitators of help-seeking relating to suicide for psychiatric populations compare to currently available suicide prevention apps. The gaps that are identified between individuals' needs and app features and functionalities will provide insights into what should be considered for future digital tools for suicide prevention including mobile apps.

2. Methods

This study was conducted in three phases, building on a rapid scoping review and app store review conducted by the research team. The barriers and facilitators of help-seeking relating to suicide were identified in the literature, and the mobile app features and functionalities were then compared to the results to identify gaps.

2.1. Rapid Scoping Review

To determine the current state of help-seeking needs relating to suicide within psychiatric populations, a rapid scoping review was conducted using the Cochrane Rapid Review Methodology [4]. To narrow our search strategy, we focused on creating detailed eligibility criteria with the primary outcome being related to suicide, including ideation, attempts, and behaviour. Studies meeting this inclusion criteria were assessed for the reporting of barriers, facilitators, or needs relating to help-seeking to prevent suicide. Our search strategy was developed using keywords within our three concept domains (i.e., suicide, help-seeking, and psychiatric populations). The search was conducted during May of 2023 using the following databases: MEDLINE, Scopus, CINAHL, PsycInfo, and EMBASE. During data extraction, an adapted ecological model [5] was utilized to categorize the barriers and facilitators of help-seeking identified in each paper. This allowed for findings related to help-seeking to be grouped on five levels: individual, interpersonal, organizational/institutional, community, and national policy/law.

2.2. App Store Review

To identify mobile apps that are currently available to support suicide prevention, a search was conducted in the Apple and Android app stores using search terms related to suicide, suicide prevention, and safety planning. Apps meeting the following inclusion criteria were included: free to download, developed in the English language, and explicit provision of resources or tools to support suicide prevention. Eligible apps

were downloaded, and data were extracted including descriptive information, security features, and personalization options. The availability of features and functionalities of each app was captured using the *Essential Features Framework* [6]. This framework assesses mobile apps for suicide prevention through 8 domains including general information regarding suicide, wellness, positivity and inspiration, distraction and alternate activities, safety planning, screening tools, helpful resources, and immediate help-seeking [6].

2.3. Mapping Barriers and Facilitators of Help-Seeking to Available App Features

Barriers and facilitators of help-seeking identified from the rapid scoping review were grouped based on the five levels of the adapted ecological model [5]. Features and functionalities of eligible suicide prevention apps were subsequently mapped onto the model if the app provided relevant resources or tools that addressed one of the mapped barriers or facilitators This process was conducted for all barriers and facilitators identified in the literature review and each app included from the app store review to determine which needs might be addressed via currently available suicide prevention apps.

3. Results

3.1. Rapid Scoping Review

The rapid scoping review yielded 42 studies from which barriers and facilitators were identified during data extraction. An overview of the number of barriers and facilitators identified is included in Table 1.

Table 1. Barriers and facilitators of help-seeking for suicide within psychiatric populations.

Ecological Level	Outcomes
Individual	27 studies reporting barriers, 16 studies reporting facilitators
Interpersonal	24 studies reporting barriers, 22 studies reporting facilitators
Organizational	26 studies reporting barriers, 15 studies reporting facilitators
Community	11 studies reporting barriers, 10 studies reporting facilitators
National/Policy	8 studies reporting barriers, 1 study reporting facilitators

3.2. App Store Review

The app store review resulted in the identification of 52 apps. Of these, 90.4% included general information about suicide (n=47), 21.2% included wellness resources (n=11), 63.5% included messages and information relating to positivity and inspiration (n=33), and 42.3% included distraction and alternative activities such as coping strategies (n=22). Safety planning features were included in 38.5% of the apps (n=20) and 17.3% included monitoring and screening tools to chart changes in mood, levels of distress, or personal suicide risk (n=9). The most common feature was information about helpful resources, such as contact details for suicide prevention helplines and local mental health services, which were included in all apps (n=52, 100%). Lastly, 90.4% of apps included resources for immediate help-seeking (e.g., direct crisis line) providing fast access through the app homepage (n=47).

3.3. Mapping Barriers and Facilitators of Help-Seeking to Available App Features

Facilitators and barriers of help-seeking across three levels of the adapted ecological model were addressed by features available in one or more of the 52 suicide prevention apps (Table 2). The most commonly addressed level was "individual", with 100% of apps (n=52) providing helpful resources responding to the facilitator of help-seeking for information about accessible support and self-help. Some apps also provided features or functionalities in alignment with help-seeking at the "interpersonal" level, with 11.5% (n=6) of apps responding to an interpersonal help-seeking need. At the "community" level, 94.2% (n=49) of apps responded to a facilitator of help-seeking. No app features or functionalities addressed barriers or facilitators at the organizational or policy level.

At the individual level, the app feature of signposting to helpful resources responds to the barrier identified in the literature review relating to help-seeking being impeded by a lack of knowledge about how and where to access support. In a fifth of cases (21.2%, n=11) this information was linked to location, supporting help-seeking at both individual and community levels. As identified in the literature review, capacity to cope has also been identified as a facilitator of help-seeking relating to suicide. Coping skills were addressed through a number of apps through positive and inspirational content as well as distraction activities and suggested coping strategies. A third facilitator of help-seeking at this level was self-awareness; this skill could be supported through the use of a number of the suicide prevention apps through the availability of screening tools (17.3%, n=9) or information about warning signs (82.7%, n=43), which could increase the users' awareness of their own mood, safety, and frequency of suicidal thoughts and/or behaviours.

The interpersonal level included the facilitator of emotional support and encouragement to seek help from friends, families, or other trusted individuals and was addressed by 9 apps. This was supported by providing the functionality for individuals to create and share suicide safety plans digitally with identified support persons. This feature allows friends and families to become more aware of an individual's level of vulnerability and needs and the ways in which they can provide support.

At the community level, the availability of resource information for mental health services and community-based care was reported as a facilitator of help-seeking. Nearly all apps provided content details of suicide prevention phone lines and emergency or mental health services available remotely or within the user's community to encourage help-seeking.

Table 2. Mapping of help-seeking needs addressed by existing suicide prevention apps.

Level	Help-Seeking Need	Essential Content Identified in App Review
Individual	Knowledge on where to seek help	52/52 (100%) helpful resources 47/52 (90.4%) immediate support
	Capacity to cope	33/52 (63.5%) positivity and inspiration 22/52 (42.3%) distraction/alternate activities
	Self-awareness	9/52 (17.3%) screening tools 43/52 (82.7%) warning signs
Interpersonal	Support from family and friends	6/52 (11.5%) sharing safety plans
Community	Access to services in the community	49/52 (94.2%) remote and community-based services

4. Discussion

This mapping exercise identified gaps at the organizational and national/policy level as no apps responded to the facilitators or barriers of help-seeking associated with these levels. Though, this was expected as the barriers to help-seeking at these levels were often systemic issues that require complex interventions and national changes that cannot be meaningfully addressed through a digital means alone.

Barriers at the national/policy levels illustrated the impact of socio-demographic risk factors and the social determinants of suicide including health care coverage and cultural and societal values such as racism, gender discrimination, and perception of suicide [7]. Organizational-level barriers highlighted issues within healthcare systems, including dehumanization in mental healthcare, patients' distrust in healthcare, and the stigma associated with admissions involving individuals who have attempted suicide or have a mental illness. Although it is evident that these issues cannot be solved through the use of a digital tool, there are ways in which suicide prevention apps can momentarily relieve some of the impacts of these barriers and support clinical care. For example, the use of mobile health apps and other digital interventions have been shown to reduce stigma by allowing anonymity within supportive online communities [8]. Digital interventions that focus on building self-confidence and acceptance through peer support have been reported to be beneficial for individuals experiencing health challenges that are often highly stigmatized including HIV, eating disorders, and suicide [9]. These digital tools present a unique opportunity for individuals to seek help while reducing experiences of stigma, though they are not a replacement for clinical care. The greatest benefit is likely to be achieved through high-quality clinical care and the complementary use of suicide prevention apps that promote the use of safe and non-stigmatizing language.

In summary, our mapping exercise suggests that while suicide prevention apps can address individual, interpersonal, and community-level help-seeking needs, they have limited efficacy with regard to higher-level organizational and policy-related challenges due to systemic barriers such as socio-demographic factors, and healthcare system issues, including stigma and coverage. While we have discussed how apps can potentially reduce stigma and enhance anonymity, it's essential to emphasize that they cannot replace clinical care.

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