

The effect of explicit suicide language in engagement with a suicide prevention search page help seeking prompt: a non-randomised trial

Sandersan Onie, Susanne Armstrong, Natasha Josifovski, Patrick Berlinquette, Nicola Livingstone, Sarah Holland, Coco Finemore, Nyree Gale, Emma Elder, George Laggis, Cassandra Heffernan, Adam Theobald, Michelle Torok, Fiona Shand, Mark Larsen

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Abstract

Background: Given that signage, messaging, or advertisements are the gateway to many interventions in suicide prevention, it is important that we understand what type of messaging works best for whom.

Objective: We investigated whether explicitly mentioning suicide increased engagement by using internet ads, by investigating engagement with campaigns with different categories of keywords searched, which may reflect different cognitive states.

Methods: We ran a two-arm study Australia-wide, with or without advertisements featuring explicit suicide wording. We analysed whether there were differences in engagement for campaigns with explicit and non-explicit advertisements for low-risk (distressed but not explicitly suicidal), high-risk (explicitly suicidal) and help-seeking for suicide keywords.

Results: Our analyses revealed that having explicit wording has opposite effects depending on the search terms used: explicit wording reduces the engagement rate for individuals searching for low-risk keywords but increases engagement for those using high-risk keywords.

Conclusions: The findings suggest that individuals who are aware of their suicidality respond better to campaigns that explicitly use the word suicide. It was found that individuals who were searching for low-risk keywords also responded to the explicit advertisement, suggesting some individuals are searching for low-risk keywords that are experiencing suicidality. Implications and future directions are discussed.

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Original Manuscript

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Conclusions: The findings suggest that individuals who are aware of their suicidality respond better to campaigns that explicitly use the word suicide. It was found that individuals who were searching for low-risk keywords also responded to the explicit advertisement, suggesting some individuals are searching for low-risk keywords that are experiencing suicidality. Implications and future directions are discussed.

Keywords: suicide, suicide prevention, google, google ads, internet search, explicit wording

Introduction

Over the past decade, there has been a growth in the different types of interventions for people contemplating suicide. For example, apps can help people keep themselves safe during a suicidal crisis [1], phone booths are installed at frequently used locations which give rapid access to a suicide hotline [2] or an online banner containing a suicide hotline number may appear if individuals search for suicide-related terms in a search engine [3]. Despite these help seeking pathways, recent research has shown that less than half of suicidal individuals will seek professional help before a suicide attempt [4]. Thus, in parallel to developing new interventions, it may be important to understand how best to promote help seeking and access to help for individuals contemplating suicide for existing services and products.

Help seeking prompts may function as a gateway to these interventions and come in various forms. In this case, a help seeking prompt refers to any media encouraging service use. For example, a person may prompt an individual to see their GP for their mental health, a description on an app store may prompt them to download a suicide prevention app, signage at frequently used locations may point them towards a phone booth, or text on an internet search page may encourage individuals to call a hotline. All these help seeking prompts play an important role in being the first point of engagement for the individual, introducing the intervention and promoting its use. If the advertisement cannot encourage the individual to engage with the intervention, it cannot fulfil its role.

One way we can investigate how different types of prompt messaging affect engagement is by using

internet search advertisements. Previous studies have shown that individuals may search for suicide-related terms on the internet before an attempt [5], search volumes for a particular region correspond to the suicide rate for that region [6] and that internet searches are used to seek help [7]. For example, an individual may use the internet to find the closest crisis centre, a local psychiatrist, or an app to help manage their suicidal thoughts. Searching for 'suicide help' yields over 1 billion results on Google, and previous studies have shown a high frequency of searches, with over 120,000 searches over a 19-day study period for suicide and distress-related keywords in Australia alone⁷. Thus, the search page may be an ideal place to intervene and investigate what messaging is most effective for individuals contemplating suicide.

Internet search ads are triggered when keywords from a prepared list are searched, presenting an advertisement at the top of the search results which links to a relevant page or intervention. Internet search ads also offer the ability to assess how different types of messaging perform with people in different cognitive states, reflected by their search terms. For example, individuals searching for keywords associated with suicide but not explicitly communicating suicidality (e.g., loneliness, hopelessness) may engage differently with a particular ad wording than individuals searching for keywords explicitly indicating suicidality or seeking help. This allows us to assess what messaging is best for different risk or distress levels.

The reach and effectiveness of these ads are measured by the impressions (how many times the advertisement is shown), clicks (clicks on the advertisement), and conversions (specific behaviours performed on the linked website). Engagement is specifically measured by the click-through rate (the proportion of individuals who saw the advertisement and then clicked on it), the conversion rate (the proportion of individuals who clicked on the ad and then engaged with the website), and the total conversion rate (the proportion of individuals who saw the advertisement and then engaged with the website) [7].

A previous study has highlighted that one major discussion area regarding communicating with an individual contemplating suicide is the explicit use of the word 'suicide' in the advertisement [8]. In one component of this study, lived experience advisors indicated that the use of the word suicide in advertisements might alienate some individuals who may indeed be experiencing thoughts of suicide but may not recognise, acknowledge, or identify their thoughts as being of suicide. The advisors elaborated that by not using the word suicide, we may be able to reach individuals at a pre-crisis phase for early intervention.

Conversely, other lived experience advisors from the same study communicated that it was imperative to be clear on the subject matter by using the word 'suicide'. These advisors communicated that by being explicit, we can overcome the stigma associated with the word, and the individual contemplating suicide may be more likely to engage with the service as it is specific to their needs or current situation. This is further supported by contemporary suicide first aid programs, which encourage the explicit use of the word suicide for the same reason [9]. Furthermore, all lived experience advisors highlighted the importance of understanding what wording is effective for different suicide risk levels to maximise engagement. For example, non-explicit wording may be particularly effective for individuals contemplating suicide, but not in a suicidal crisis, as they may not identify their thoughts being that of suicide – and vice versa.

In the current study, we sought to compare engagement with two internet advertisement campaigns, one with explicit suicide wording in its advertisement and the other with non-explicit suicide wording. We also investigated whether the pattern of engagement differed by the type of keyword searched (low risk, high risk, help seeking or means-specific). We also examined engagement by

gender, age, and time of day.

First, we hypothesised that the campaign with explicit wording relating to suicide would perform better for individuals searching for high risk, help seeking, or means-specific keywords. Given that these individuals are explicitly experiencing suicidal ideation can identify and communicate it, they may respond better to an ad that is explicit in what issue it is addressing. Second, we hypothesised that for individuals searching for low risk-keywords, the non-explicit ad wording would have higher engagement as the explicit wording may alienate individuals who do not identify as having suicidal thoughts. Third, given that the key manipulation is in the advertisement's wording and not the linked web pages, we hypothesised that we should see this increased engagement in the click-through rate but not the conversion rate (and, as such, also see increased engagement in the total conversion rate).

Methods

Study Design

The study employed a 2-arm quasi-experimental design (explicit vs non-explicit ad wording) with 4 initial pathways (individuals searching for different types of keywords: Low Risk, High Risk, Help Seeking, and Means Specific – these categories are described in more detail below).

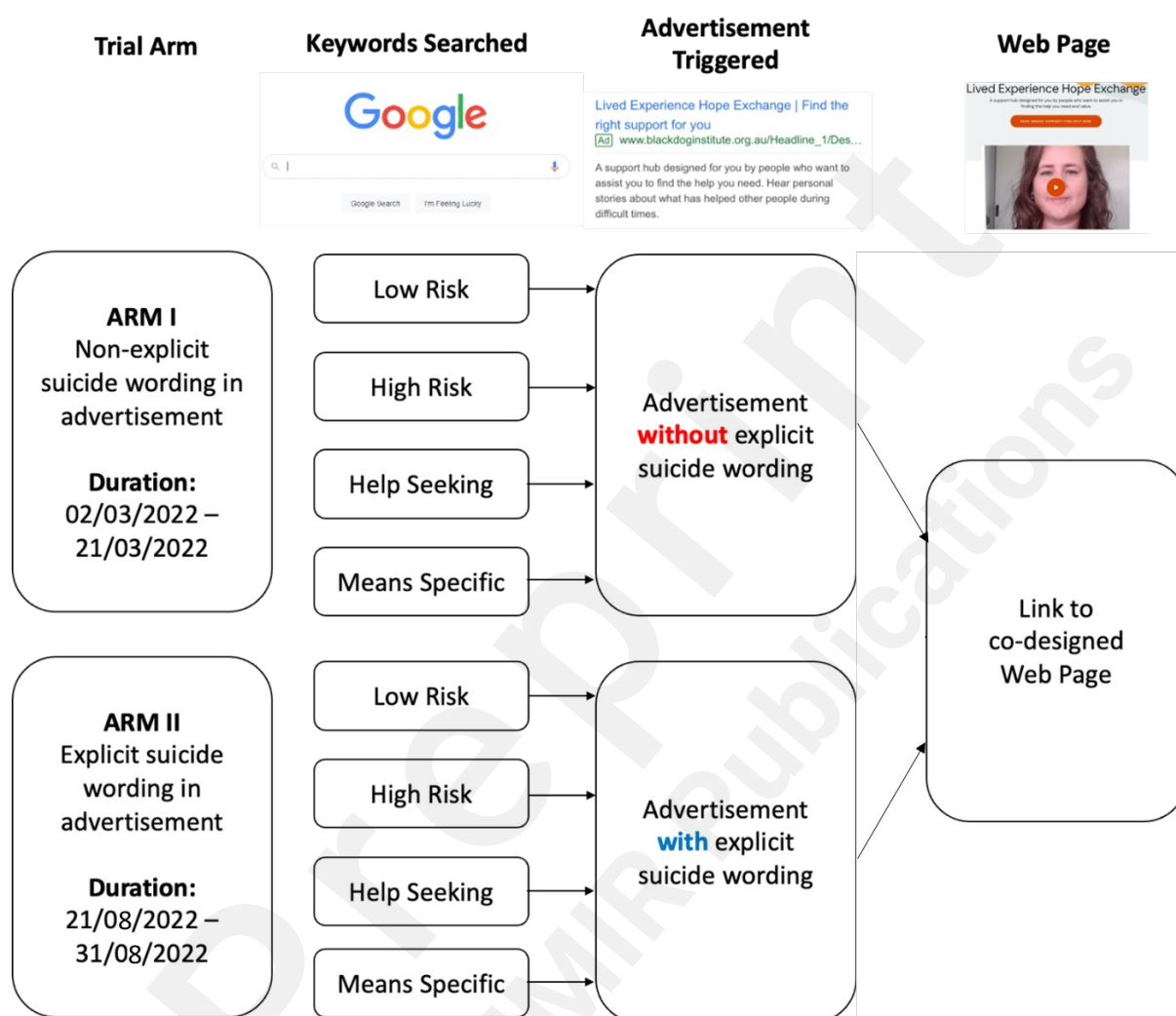
Participants

Individuals over the age of 18 and currently residing in Australia were included in the study. Google infers age and gender of individuals through multiple sources of information, primarily the age and gender inputted when creating a Google account, as well as past browsing history (such as sites visited and engagements) collected through website cookies.

Intervention

The University of New South Wales Human Research Ethics Committee approved this study. The first arm employed advertisements without explicit suicide wording and ran from 2nd of March 2022

Schematic of Google AdWords Campaigns



until the 21st of March 2022. The second arm employed advertisements with explicit suicide wording and ran from 21st August 2022 until 31st August 2022. The first arm was run as part of another larger study pertaining to the effectiveness of Google Ads campaigns in reaching individuals thinking of suicide and has been reported elsewhere⁷. The arms of the trial were run sequentially, not concurrently. Thus, there was no randomisation present. Full details of the keyword generation, advertisement and landing page co-design process, and content of the landing pages and linked pages can be found elsewhere⁸. A schematic of the campaign can be found in Figure 1 below.

Figure 1. Schematic of Google Ads Campaign

Keywords

Together with lived experience advisors, researchers and a Google Ads agent, we generated four lists of keywords: Low Risk keywords which included keywords people are likely to search when in distress or situations associated with suicide, without explicitly mentioning suicide (e.g., “feeling so alone”; “debt”); High Risk keywords which included keywords explicitly communicating suicidal ideation or help seeking (e.g., “I want to die”); Help Seeking keywords which included keywords

explicitly searching for help for suicidal thoughts (e.g., “suicide help”), and Means Specific keywords which relate to searching or utilising specific means. The list of keywords can be found here (<https://osf.io/d6m45/>). When keywords are entered into Google Ads, the ads will also trigger when semantically similar search terms are entered; thus, the total number of keywords that will trigger the ad is substantially larger than what is inputted.

Advertisements

The advertisements were co-designed alongside a group of lived experience advisors and investigators. The co-design process yielded six advertisements, three with explicit suicide wording and three without explicit suicide wording, while controlling as much as possible for other content. Each ad was as closely matched as possible to its counterpart – that is, the first ad in the explicit condition has the same messaging and content as the first ad in the non-explicit condition, save for explicit suicide wording in the first sentence. We developed more than one advertisement for each condition to allow our findings to be more generalisable and to reflect larger themes found in our co-design process⁸ rather than specific wording.

All the advertisements across both conditions were controlled for the number of characters and number of words, with a range of 38 – 43 words and 215 – 234 characters. The absolute difference in character and word count between each ad and its counterpart was between 1 and 5 characters and 1 and 3 words, respectively.

The co-designed text for the non-explicit wording ads are below. All character counts include spaces.

- *Lived Experience Hope Exchange. Find the right support for you. A support hub designed for you by people who want to assist you to find the help you need. Hear personal stories about what has helped other people during difficult times. (237 characters; 41 words)*
- *Looking for some support? Designed with Lived Experience. Our Hope Exchange has been designed by people who may understand how you're feeling. There are lots of ways to seek help. We want to find the right one for you. (220 characters; 39 words)*
- *Find the right support for you. Lived Experience Hope Exchange. We want to help you to find the help that you need and value during challenging times. Hear stories and advice from people who may have felt the way you're feeling now. (234 characters; 42 words)*

The matched text for the explicit wording ads are below:

- *Are you feeling suicidal? Lived Experience Hope Exchange. Support designed for you. Designed by people who want to assist you to find the help you need. Hear personal stories about what has helped other people during difficult times. (235 characters; 38 words)*
- *Help for suicidal thoughts. Looking for some support? Designed with Lived Experience. Designed by people who may understand how you're feeling. There are lots of ways to seek help. We want to find the right one for you. (221 characters; 38 words)*
- *Dealing with suicidal thoughts. Find the right support for you. Lived Experience Hope Exchange. We want to help you to find the help that you need and value. Hear stories and advice from people who may have felt the way you're feeling now. (241 characters; 43 words)*

In each campaign condition, ads were shown to users independently of which category of keywords were searched. When the advertisement triggered, one of three advertisements in that condition would be randomly shown, resulting in equal presentations across the study.

Landing page

In collaboration with lived experience advisors, we co-designed a series of landing pages containing lived experience stories, calming and distracting activities, and links to support services and hotlines with descriptions of what the individual will likely experience when engaging in these services. Details of the pages can be found elsewhere.⁸

Outcomes

Data on impressions, clicks, click rate (clicks/impressions), conversions, conversion rate (conversions/clicks), cost per click, and cost per conversion was extracted from Google Ads in a de-identified, aggregated form. The total conversion rate was manually calculated (conversions/impressions). Currently, the total volume of searches for each category is not available through Google Ads.

The primary outcome was the click rate (engagement with the ad) as our manipulation was on the search page rather than on the landing page. Our secondary outcomes were the total conversion rate (total engagement with the campaign, that is, all things being equal, the conversion rate per impression) and the conversion rate (engagement with the landing page).

Conversions contained behaviours the investigators, lived experience advisors, and the collaborative team considered positive. Triggering any of these conditions was considered a conversion, including:

- Clicking the 'get help' button to see available support services
- Downloading any file pertaining to the modules to help de-escalate crisis or for self-help for suicidality
- Clicking on a link to call a support service
- Spending more than two minutes on the website that was designed to promote help seeking and de-escalate crisis, as an indication that the individual was engaging with content on the site

Statistical Methods and Analyses

In the main analysis, each combination of outcome metric (click rate, conversion rate, and total conversation rate) and keyword type (high risk, low risk and help seeking) was considered separately. The outcome metric rates associated with the explicit and non-explicit wording were compared using an incident rate ratio (IRR) from the "rateratio" function in the "fmsb" package in R statistics, which calculates the exact mid-p double sided p-value and calculates the confidence interval using the exact Poisson method [10,11].

Interaction terms were considered if at least one significant difference between explicit and non-explicit wording was identified for an outcome measure. In this case, a keyword category with a significant difference due to wording was compared to the other keyword categories. To test the interactions, we first calculated a difference term between the explicit and non-explicit conditions for a single keyword type. For example, we calculated the difference term for the click rate and low risk keywords as:

$$\text{Click Rate}(\text{Low Risk}, \text{Explicit}) = \frac{\text{Click}(\text{Low Risk}, \text{Explicit})}{\text{Impressions}(\text{Low Risk}, \text{Explicit})} = \frac{a_1}{b_1}$$

$$\text{Click Rate}(\text{Low Risk}, \text{Non Explicit}) = \frac{\text{Click}(\text{Low Risk}, \text{Non Explicit})}{\text{Impressions}(\text{Low Risk}, \text{Non Explicit})} = \frac{a_2}{b_2}$$

assuming $b_1 < b_2$

$$\text{Difference Term}(\text{Click Rate}, \text{Low Risk}) = \frac{a_1}{b_1} - \frac{a_2}{b_2} = \frac{\left(\frac{b_2}{b_1} * a_1\right) - a_2}{b_2}$$

if $b_1 > b_2$, switch $a_1 \wedge a_2, \wedge b_1 \wedge b_2$ as $\wedge$ not inflate power as denominator indicates sample $\wedge \wedge$

This difference term was compared with the other keyword difference terms using the “ratedifference” function in the “fmsb” package in R, which employs a chi-squared test to test for a significant incidence rate difference (IRD) [11]. Thus, this analysis assessed interaction by assessing a difference of a difference.

Where a significant difference of differences (i.e. an interaction) was identified in the outcomes, post-hoc tests were conducted to determine whether there were underlying differences in the relevant outcome metrics for the explicit or non-explicit wording conditions, or both.

Results

Campaign Metrics

A total of 153,768 impressions, 7,263 clicks, and 1,657 conversions were achieved during the study periods. The engagement metrics, reported by trial condition, age and gender, are reported in Table 1.

Table 1. Engagement metrics by trial condition, age, and gender.

Trial Condition	Gender	Age Range	Impressions	Clicks	Click Through Rate	Conversions	Conversion Rate	Total Conversion Rate
Non-Explicit	Male	18-24	6,191	308	4.97%	39	12.66%	0.63%
		25-34	6,955	261	3.75%	52	19.92%	0.75%
		35-44	6,770	313	4.62%	77	24.60%	1.14%
		45-54	6,975	398	5.71%	122	30.65%	1.75%
		55-64	4,644	257	5.53%	93	36.19%	2.00%
		65+	2,695	169	6.27%	36	21.30%	1.34%
		All Ages	34,230	1,706	4.98%	419	24.56%	1.22%
	Female	18-24	13,243	796	6.01%	89	11.18%	0.67%
		25-34	17,448	708	4.06%	135	19.07%	0.77%
		35-44	17,996	869	4.83%	180	20.71%	1.00%
		45-54	18,963	1,013	5.34%	311	30.70%	1.64%
		55-64	12,675	737	5.81%	187	25.37%	1.48%
		65+	6,326	398	6.29%	98	24.62%	1.55%
		All Ages	86,651	4,521	5.22%	1,000	22.12%	1.15%

Explicit	Male	18-24	1,825	62	3.40%	4	6.45%	0.22%
		25-34	2,281	62	2.72%	21	33.87%	0.92%
		35-44	2,052	64	3.12%	13	20.31%	0.63%
		45-54	1,941	76	3.92%	19	25.00%	0.98%
		55-64	1,351	54	4.00%	15	27.78%	1.11%
		65+	841	46	5.47%	8	17.39%	0.95%
		All Ages	10,291	364	3.54%	80	21.98%	0.78%
	Female	18-24	3,436	104	3.03%	16	15.38%	0.47%
		25-34	4,474	108	2.41%	21	19.44%	0.47%
		35-44	4,489	140	3.12%	30	21.43%	0.67%
		45-54	4,824	136	2.82%	37	27.21%	0.77%
		55-64	3,381	97	2.87%	28	28.87%	0.83%
		65+	1,992	87	4.37%	26	29.89%	1.31%
		All Ages	22,596	672	2.97%	158	23.51%	0.70%
Combined	Male	All Ages	44,521	2,070	4.65%	499	24.11%	1.12%
	Female	All Ages	109,247	5,193	4.75%	1,158	22.30%	1.06%

Due to the exceptionally low numbers in the means-specific group (11 impressions, 1 click, and 0 conversions), these campaigns were excluded from subsequent analyses.

Click-Through Rate

The click rate using explicit and non-explicit ad wordings, for each keyword category is shown in Figure 2. A significant difference between explicit and non-explicit ad wording for low risk keywords was found ($p < .0001$, IRR = 1.848, 95% CI [1.718, 1.987]), in which there was a higher click through rate for non-explicit keywords (5.11% vs. 2.77%). For help seeking keywords, there was a significantly higher click rate for the explicit keywords ($p = .0002$, IRR = 0.715, 95% CI [0.599, 0.854], 3.50% vs. 4.93%). A similar pattern was observed for the high risk keywords, although this was only marginally non-significant ($p = .0522$, IRR = 0.711, 95% CI [0.503, 1.005], 6.33% vs. 8.85%).

We then investigated the presence of two-way interactions between the three groups (Low risk and High risk, Low risk and Help seeking, High risk and Help seeking). All two-way interactions were significant (High risk - Intent: $p = .04697$, IRD = 0.0109, 95% CI [0.000146, 0.0217]; High risk - Low risk: $p < .0001$, IRD = 0.0301, 95% CI [0.0301, 0.0453]; Low risk - Intent: $p < .0001$, IRD = 0.0472, 95% CI [0.0405, 0.0541]).

Post-hoc tests revealed a significant difference in the click rate between the low and high-risk keywords in the explicit condition ($p = .0006$, IRR = 0.5612, 95% CI [0.4144, 0.7784], 2.77% vs. 4.93%), and in the non-explicit condition ($p < .0001$, IRR = 1.459, 95% CI [1.216, 1.766], 5.11% vs. 3.50%). Significant differences were also found between the low-risk and help-seeking keywords in the explicit condition ($p < .0001$, IRR = 0.312, 95% CI [0.263, 0.373], 2.77% vs. 8.85%), and in the non-explicit condition ($p < .0001$, IRR = 0.807, 95% CI [0.740, 0.881], 5.11% vs. 6.33%).

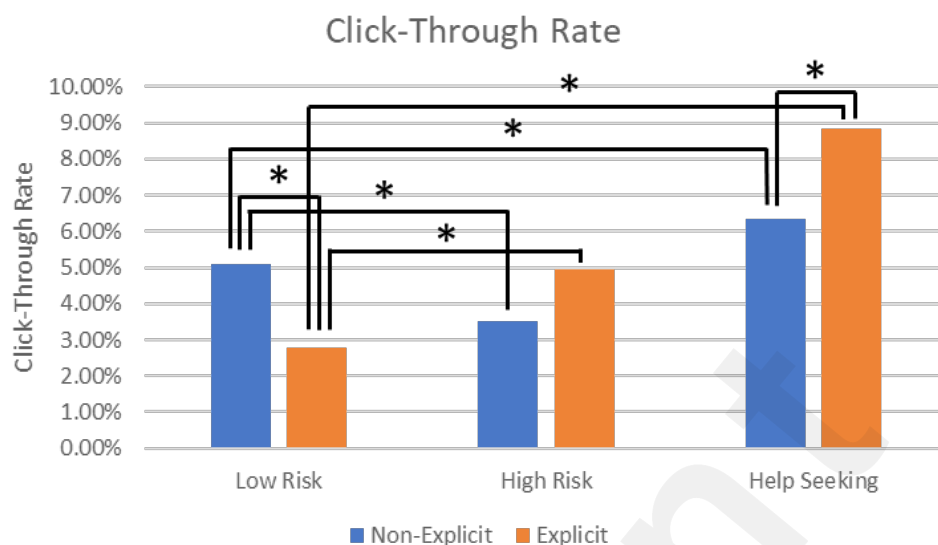


Figure 2. Click-Through Rate by Keyword Type and Condition. * denotes $p < .05$.

Conversion Rate

A graphical representation of the conversion rate data is shown in Figure 3. There were no significant differences between the conditions (low risk: $p = .6901$, IRR = 1.0326, 95% CI [0.882, 1.209], 21.86% vs. 21.17%; high risk: $p = .2548$, IRR = 0.726, 95% CI [0.418, 1.263], 31.36% vs. 43.18%; help seeking: $p = .3456$, IRR = 1.182, 95% CI [0.835, 1.674], 29.74% vs 25.16%), thus interaction effects were not explored.

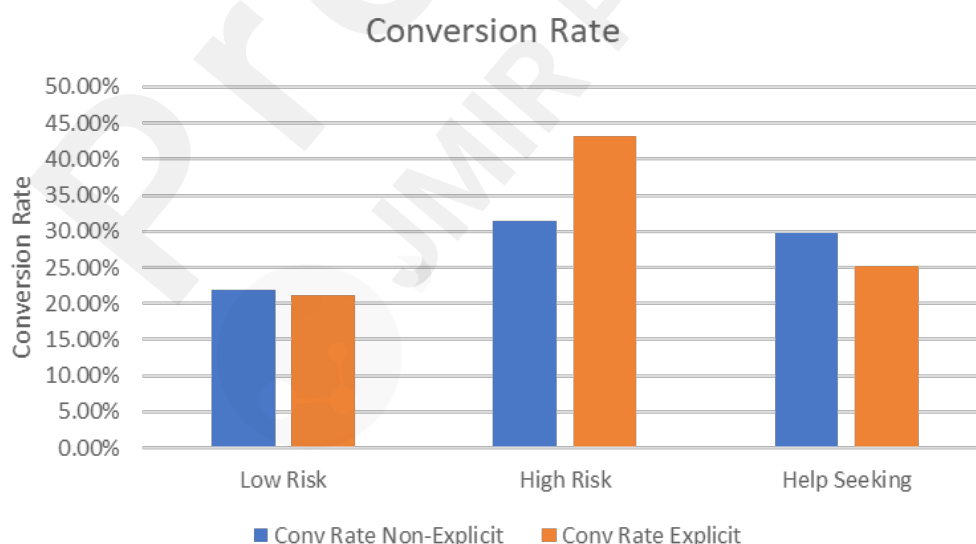


Figure 3. Conversion Rate by Keyword Type and Condition.

Total Conversion Rate

A graphical representation of click-through rate can be seen in Figure 4. There was a significant difference in the total conversion rate for low risk keywords ($p < .0001$, IRR = 1.908, 95% CI [1.630, 2.234]) in which the non-explicit ad wording had a higher total conversion rate (1.12% vs 0.59%); and high risk keywords ($p = .01703$, IRR = 0.846, 95% CI [0.297, 0.896]) in which the explicit

wording had a higher total conversion rate (1.10% vs 2.13%); however, there was not enough evidence to suggest a difference between explicit and non-explicit wording (1.88% vs 2.23%, respectively) when an individual was searching for help seeking related keywords ($p = .3441$, IRR = 0.846, 95% CI [0.597, 1.197]).

Possible interactions between the three groups (Low risk and High risk, Low risk and Help seeking, High risk and Help seeking) were explored. A significant interaction was identified between the low risk and high risk keywords ($p < .0001$, IRD = 0.00875, 95% CI [0.00613, 0.0114]), as well as the low risk and help seeking keywords ($p < .0001$, IRD = 0.0156, 95% CI [0.00901, 0.0222]), but no significant interaction of the high risk and help seeking keywords ($p = .06204$ IRD = -0.00685, 95% CI [-0.0141, 0.000345]).

Post-hoc tests revealed a significant difference in the total conversion rate between the low and high risk keywords in the explicit condition ($p < .0001$, IRR = 0.275, 95% CI [0.171, 0.442], 0.59% vs. 2.13%), but not in the non-explicit condition ($p = 0.9184$, IRR = 1.017, 95% CI [0.733, 1.411], 1.12% vs. 1.10%).

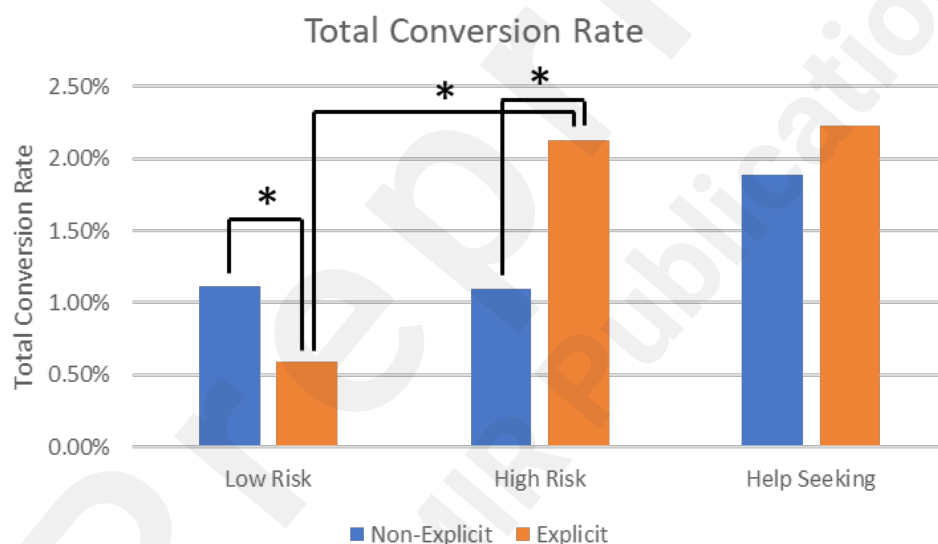


Figure 4. Total Conversion Rate by Keyword Type and Condition. * denotes $p < .05$.

A summary of analyses outcomes can be seen in Table 2.

Table 2. Summary of analyses outcomes.

Metric	Keyword Type	Significant Comparisons	Significant Interactions
Click Through Rate	Low risk	Non – explicit > Explicit	Low risk x High risk Low – Risk x Help Seeking High – Risk x Help Seeking
	High risk	Explicit > Non-explicit ^a	
	Help Seeking	Explicit > Non-explicit	
Conversion Rate	Low risk	n.s.	n.a.

	High risk	n.s.	Low risk x High risk Low – Risk x Help Seeking
	Help Seeking	n.s.	
Total Conversion Rate	Low risk	Non – explicit > Explicit	
	High risk	Explicit > Non-explicit	
	Help Seeking	n.s.	

Note: n.s. = not significant; n.a. = not available; used when interaction analyses were not done due to non-significant comparisons. ^a = marginal significance, $p < .06$

Discussion

In this study, we compared the impact of explicit and non-explicit suicide wording in an online ad campaign and webpage targeting those searching for suicide and distress related keywords. Analyses on click-through rate revealed that for low risk keywords, non-explicit wording had a higher click rate; for high risk keywords, there was marginal evidence that explicit wording had a higher click rate; and for help seeking keywords, explicit wording had a higher click rate. For conversion rate, there was no evidence for any differences between conditions. The analyses of the total conversion rate revealed that for low risk keywords, non-explicit wording had a higher total conversion rate; for high risk keywords, explicit wording had a higher total conversion rate; and for help seeking keywords, there was no evidence of a difference.

Further analysis of the click rate revealed two-way interactions between the low and high-risk keywords, the low risk and help seeking keywords, and the high risk and help seeking keywords – suggesting that the effect of explicit wording in the ad differed among these groups. Further exploratory analyses revealed significant differences between low risk and high risk keywords, as well as low risk and help seeking words in the explicit and non-explicit condition. These findings further support the suggestion that the effect of wording differentially impacts engagement in keyword groups, rather than an interaction emerging due to the manipulation only affecting one group but not the other. Together, these findings suggest that ads with explicit suicide language were less likely to be clicked on than those with non-explicit language, when individuals were searching for low risk keywords. The reverse was observed when searching for high risk or help seeking keywords (although the former did not reach significance) – where ads with explicit language were more likely to be clicked on. These pattern of findings may partly contribute to the pattern of findings in the total conversion rate in which analyses revealed two-way interactions between low and high risk keywords, and low risk and help seeking keywords – suggesting that the effect of explicit wording in the ad differed among these groups. Exploratory analyses revealed that the interaction between low- and high risk keywords may be driven by a higher total conversion rate when explicit wording is used with high risk vs low risk keywords, whereas there was no apparent difference between high risk and low risk keywords when non-explicit wording was used. These findings suggest that having explicit wording has opposite effects depending on the search terms used: explicit wording reduces the total conversion rate for individuals searching for low risk keywords, but increases total conversion rate for those using high risk keywords. There is no evidence to suggest that explicit or non-explicit wording affects total conversion rate when help seeking keywords are used. These findings support both recommendations from lived experience advisors, both for and against the use of explicit wording, as perhaps both are appropriate for individuals in different states.

Overall, these findings suggest that individuals who are searching for help seeking or high risk

suicide terms respond more to ads and campaigns with explicit suicide wording, demonstrated by the higher click rate and total conversion rate respectively. Alternatively stated, an ad campaign targeting individuals searching high risk keywords is likely to lead to more desirable behaviours if explicit wording is used. This may be because individuals may respond more strongly to a campaign that specifically targets their current situation. Given that the ad explicitly communicates and labels their current issue, individuals may be more inclined to seek help. As the non-explicit ad contained no indication that the campaign is for suicidality, the users may not have been certain that the webpage was able to meet their needs.

Furthermore, the high-risk search terms in this study excluded individuals who were explicitly searching for help for their suicidality. Thus, our findings suggest that explicitly naming the issue can improve help seeking for individuals at high risk of suicide but who may not be actively seeking help, as revealed in the total conversion rate. This finding is consistent with current practices in suicide prevention first aid (e.g., Applied Suicide Prevention Skills Training [9], where directly addressing and asking about suicide are strongly encouraged. The current study demonstrated that the benefit of explicit wording for individuals in crisis was generalisable beyond suicide first aid and direct face-to-face communication. This finding may have implications for other forms of communication when addressing individuals at high risk of suicide.

The results also show that individuals searching low risk suicide terms responded less to campaigns with explicit suicide wording. Since the low-risk keywords were broad (e.g., loneliness), many individuals searching these terms may not have been suicidal; hence the lower click rate. However, despite being lower, we still observed a click rate by individuals searching low risk keywords on the explicit campaign comparable to the industry standard of 3.17% [12]. This suggests that individuals who may not be searching explicit keywords may be experiencing suicidality and that targeting low risk keywords is still beneficial. Conversely, we may have seen an elevated click rate for the low risk, a non-explicit condition due to people clicking on the ad not realising it was for individuals experiencing suicidality. Nevertheless, in the low risk, non-explicit conditions, we still observed a conversion rate of over 20%, relative to the industry standard of 3.75%, suggesting that the landing page was still fulfilling a need. This may be because by using explicit suicide wording, we may alienate individuals who, for various reasons, may not recognise, identify, or acknowledge that their feelings are those of suicide. Thus, when visiting the page, their needs are met. However, one possibility is that some individuals searching low risk keywords are unaware that they are suicidal, and using the word 'suicide' may help bring awareness to these underlying feelings⁸. Thus, using explicit and non-explicit keywords may have their own benefit; however, our findings suggest that overall, using non-explicit keywords will reach more people. While many people searching low risk keywords may not be experiencing suicidality, we must ensure that little effort is needed to access suicide related resources and help, given that there are still individuals searching for low-risk keywords that are experiencing suicidality. Further research is needed to understand how best to tailor the ad to individuals searching low risk keywords.

The findings suggest that individuals experiencing suicidality and who could explicitly communicate it had higher engagement patterns with a campaign when the word 'suicide' was used in the advertisement, regardless of whether they were explicitly seeking help. However, for individuals experiencing general distress but not searching for suicide-specific terms, using explicit suicide wording leads to lower engagement with the campaign. Thus, in response to the finding that some lived experience advisors advocated for the explicit use of the word suicide while others advocated against it – perhaps both are true for individuals in different states.

We recommend that the development and design of help seeking prompts for suicide should consider

at what stage the individual is. If the prompt is intended for individuals with a lower risk of suicide - such as public media campaigns - then the use of the word suicide may decrease engagement; however, if the prompt is intended for individuals at high risk of suicide – whether they are actively seeking help or not - then use of the word suicide is likely to increase engagement. Furthermore, these findings suggest the need to co-design with a range of individuals who have experienced the spectrum of suicidality to understand their needs, the thought process, and how they speak about and internally conceptualise their distress and suicide to formulate different terms that promote help seeking and engagement.

Given that this pattern of finding has been found across two modalities (suicide first aid and internet advertisements), future research should seek to investigate the generalisability of these findings to other help seeking prompts in suicide prevention, for example, signage at frequently used locations, safety planning app notifications, or the wording on the suicide hotline banner if individuals search for suicide-related terms. Further, future research should further understand what type of ad wording works for whom. For example, previous evidence has suggested that men and women respond differently to tailored advertisements campaigns[13]. Using Google Ads, we can further investigate what type of advertisement best engages men and women.

There was a low number of searches and engagement for means-specific keywords in this study. There may be several possibilities for this. First, these numbers may reflect true rates, and only a few individuals were searching for these terms. Another possibility is that individuals at the planning stage do not primarily turn to search engines but may use other means of information seeking, as means selection has been found to be influenced by prior familiarity with the means itself [14]. Another possibility is that more individuals were searching for these terms, but our current keyword list and Google's function of generating permutations of the keyword list could not capture the range of search terms. This could be rectified by experimenting with keyword settings iterations in Google Ads to capture a wider variety of expressions. Finally, one possibility is that there are cultural differences in search behaviours. For example, a previous study found high incidences of method-related searches in Japan [15] – suggesting that cultural differences may exist. Given that a key finding in previous research was that individuals who attempted suicide had searched for means-specific keywords [8], future research should investigate how individuals search for information regarding means and how we can best intervene at this stage.

Future studies may also investigate whether these findings generalise to other psychological or health domains. For example, an individual who is acutely depressed and can identify it may respond better to an advertisement for therapy explicitly communicating that this is for individuals experiencing depression. Conversely, an individual who may also be experiencing depressive symptoms but is either unfamiliar that they are experiencing depressive symptoms or is from a background where depression is strongly stigmatised may respond better to an advertisement without explicitly using the word depression. Future studies should carefully consider conversion actions, as we cannot measure directly whether an individual is processing the information presented to them, and thus, we use proxy measures common to the marketing field e.g., time spent on page. Given the growing interest in online interventions, standardized methods for measuring engagements should be established.

The study has several limitations. One limitation is that due to resourcing constraints, there is a large difference in the number of participants in the two conditions. Furthermore, the data were collected at different times of the year, so there may be seasonal or cohort effects – future studies should run campaigns with explicit and non-explicit wording at the same time. Also, as research with this type of data is still in its infancy, future consideration should be given to understanding if, when and how

search metrics should be normalised against variations in time. Another limitation is that we can only infer cognitive states from search results but do not measure suicidality directly. For example, a person may search for a high-risk keyword as part of a research study but not be suicidal. Thus, there is added noise to the data.

Our study also has several strengths. The study was run nationwide, allowing us to sample the entire target population rather than just a specific subset. The components of this study, such as the ad wording, landing page, and keywords used to trigger the ad, were co-designed with individuals with lived and living experiences of suicide. Furthermore, by providing data on click rates and conversion rates, we provide greater mechanistic insight into the findings for total conversion rate.

In conclusion, our study demonstrates different engagement levels with a suicide prevention internet campaign due to the word 'suicide' in the search page advertisement. Future research should further explore what type of messaging works best for whom, and when paired with the flexibility of the advertising industry, we may be one step closer to ensuring that each person is met with a message that leads to the highest probability of them engaging services, using resources, or seeking help.

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Conflicts of Interest

None declared.

References

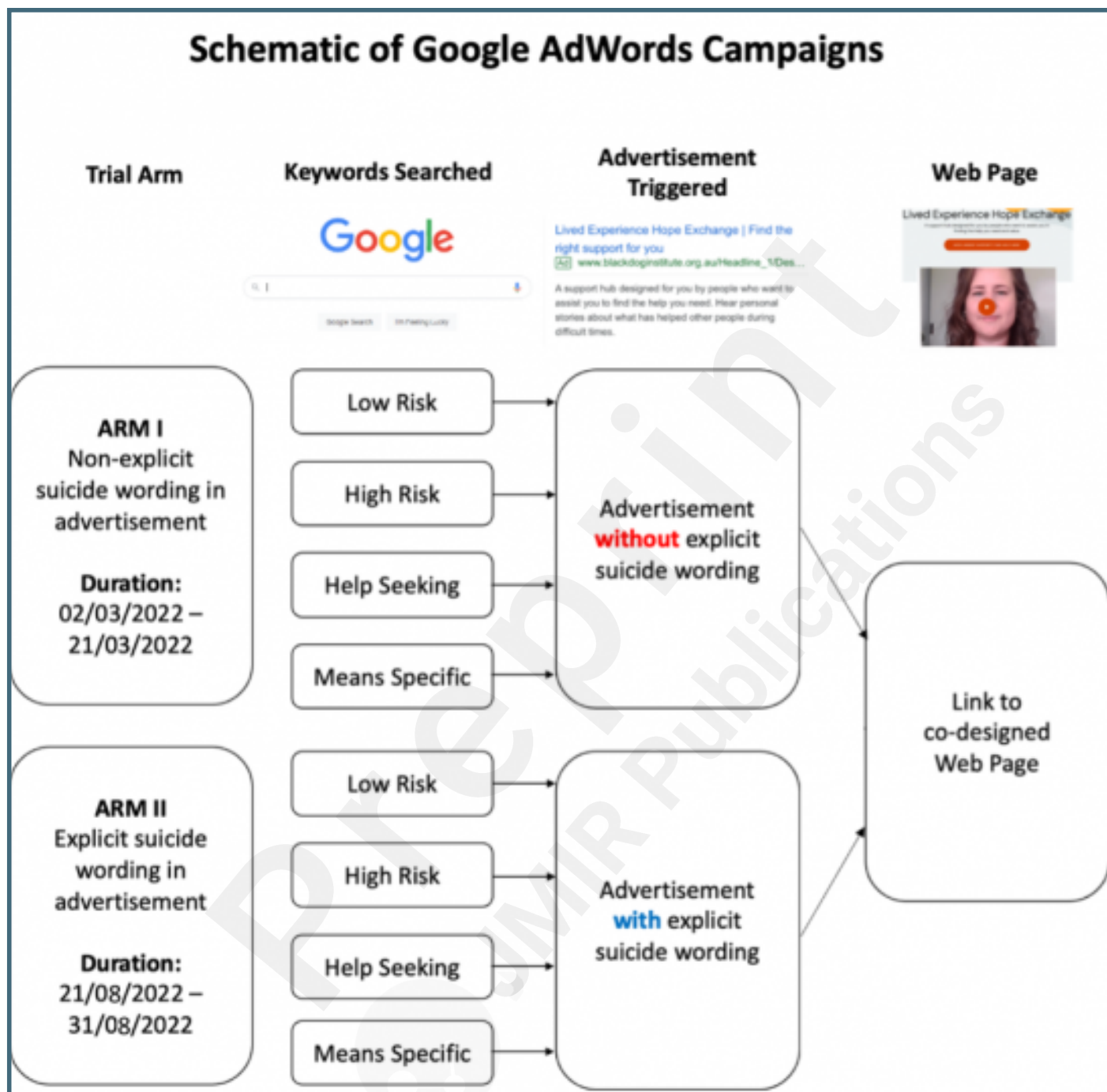
1. Han J, McGillivray L, Wong QJ, Werner-Seidler A, Wong I, Cleave A, Christensen H, Torok M. A Mobile Health Intervention (LifeBuoy App) to Help Young People Manage Suicidal Thoughts: Protocol for a Mixed-Methods Randomized Controlled Trial. *JMIR Res Protoc*. 2020 Oct 27;9(10):e23655. doi: 10.2196/23655. PMID: 33107832; PMCID: PMC7655466.
2. Lockley A, Cheung YT, Cox G, Robinson J, Williamson M, Harris M, Machlin A, Moffat C, Pirkis J. Preventing suicide at suicide hotspots: a case study from Australia. *Suicide Life Threat Behav*. 2014 Aug;44(4):392-407. doi: 10.1111/sltb.12080. PMID: 25250406.
3. Heussner KM. Google 'Suicide' Search Feature Offers Lifeline. ABC News. Retrieved from: <https://abcnews.go.com/Technology/google-suicide-search-feature-offers-lifeline/story?id=10313064>
4. Stene-Larsen K, Reneflot A. Contact with primary and mental health care prior to suicide: A systematic review of the literature from 2000 to 2017. *Scandinavian Journal of Public Health*. 2019;47(1):9-17. doi:10.1177/1403494817746274
5. Areán PA, Pratap A, Hsin H, Huppert T, Hendricks K, Heagerty P, et al. Perceived Utility and Characterization of Personal Google Search Histories to Detect Data Patterns Proximal to a Suicide Attempt in Individuals Who Previously Attempted Suicide: Pilot Cohort Study. *J Med Internet Res* 2021 May 06;23(5):e27918

6. Ma-Kellams, C., Or, F., Baek, J. H., & Kawachi, I. (2016). Rethinking suicide surveillance: Google search data and self-reported suicidality differentially estimate completed suicide risk. *Clinical Psychological Science*, 4(3), 480–484. <https://doi.org/10.1177/2167702615593475>
7. Onie S, Berlinquette P, Holland S, Livingstone N, Finemore C, Gale N, Elder E, Laggis G, Heffernan C, Armstrong SO, Theobald A, Josifovski N, Torok M, Shand F, Larsen M Suicide Prevention Using Google Ads: Randomized Controlled Trial Measuring Engagement. *JMIR Ment Health* 2023;10:e42316. doi: 10.2196/42316
8. Onie S. et al. “Co-design and Development of an Internet Search Intervention Using Google Adwords for Individuals Contemplating Suicide: The Lived Experience Hope Exchange.” *PsyArXiv*, 24 Mar. 2023. Web. Doi: 10.31234/osf.io/kzhgw
9. Gould, M.S., Cross, W., Pisani, A.R., Munfakh, J.L. and Kleinman, M. (2013), Impact of Applied Suicide Intervention Skills Training on the National Suicide Prevention Lifeline. *Suicide Life Threat Behav*, 43: 676-691. <https://doi-org.wwwproxy1.library.unsw.edu.au/10.1111/sltb.12049>
10. Hanley H (1986) Analysis of Crude Data. In: *Modern Epidemiology*, ed Rothman KJ. Boston: Little, Brown & Co.
11. Sahai H, Khurshid A (1996) *Statistics in epidemiology: methods, techniques, and applications*. Boca Raton, FL: CRC Press, Inc.
12. Irvine M. Google Ads benchmarks for your industry [updated!]. *WorldStream*. 2022 Dec 14. URL: <https://www.wordstream.com/blog/ws/2016/02/29/google-adwords-industry-benchmarks> [accessed 2023-01-27]
13. Lee S, Torok M, Shand F, Chen N, McGillivray L, Burnett A, Larsen ME, Mok K. Performance, Cost-Effectiveness, and Representativeness of Facebook Recruitment to Suicide Prevention Research: Online Survey Study. *JMIR Ment Health*. 2020 Oct 22;7(10):e18762. doi: 10.2196/18762. PMID: 33090115; PMCID: PMC7644381.
14. Milner, A., Witt, K., Maheen, H. *et al.* Access to means of suicide, occupation and the risk of suicide: a national study over 12 years of coronial data. *BMC Psychiatry* 17, 125 (2017). <https://doi.org/10.1186/s12888-017-1288-0>
15. Takahashi, A., Sueki, H., Ito, J. Reflection of Suicidal Ideation in Terms Searched for by Japanese Internet Users. *Crisis*. 44(4). 2022. Doi: <https://doi.org/10.1027/0227-5910/a000854>

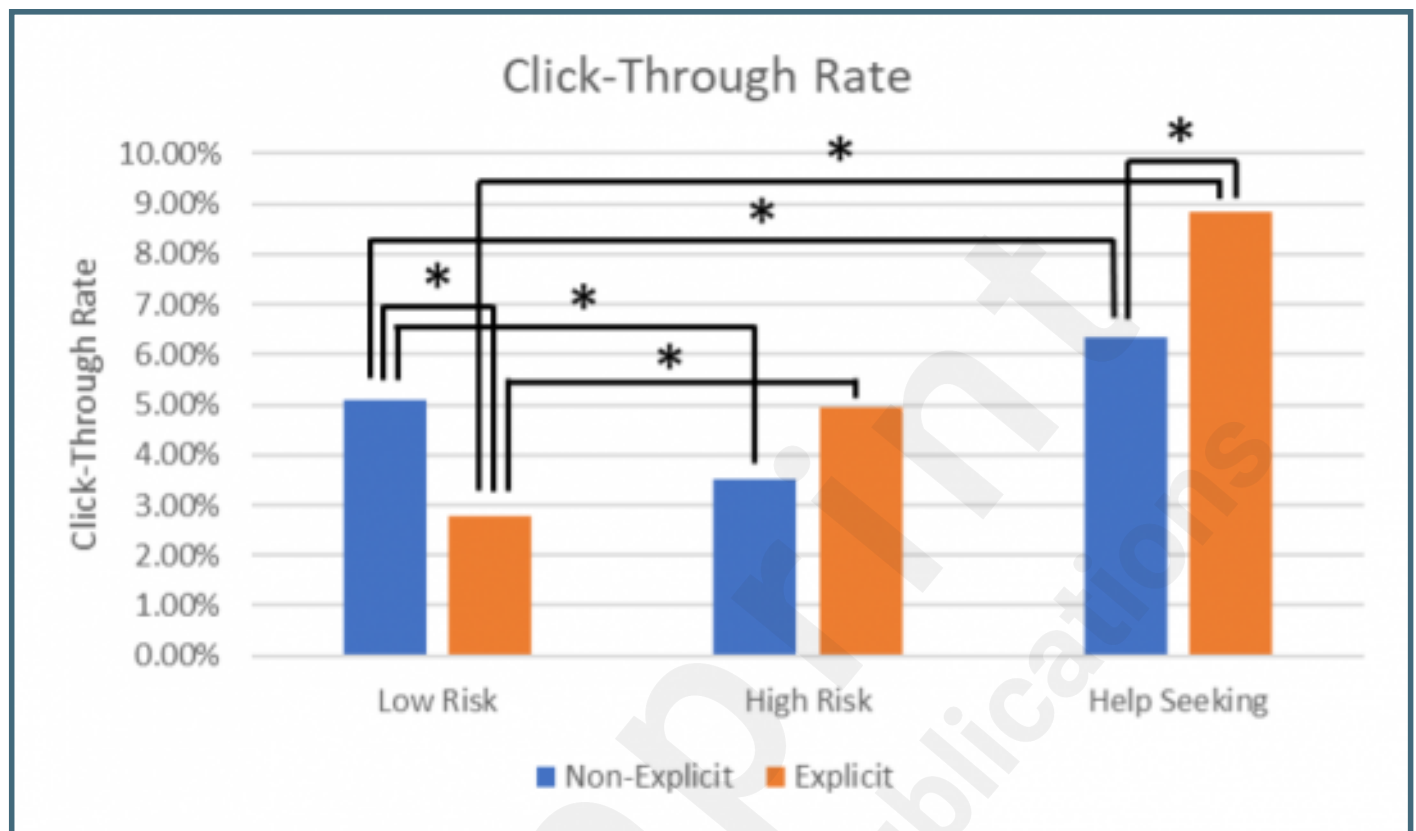
Supplementary Files

Figures

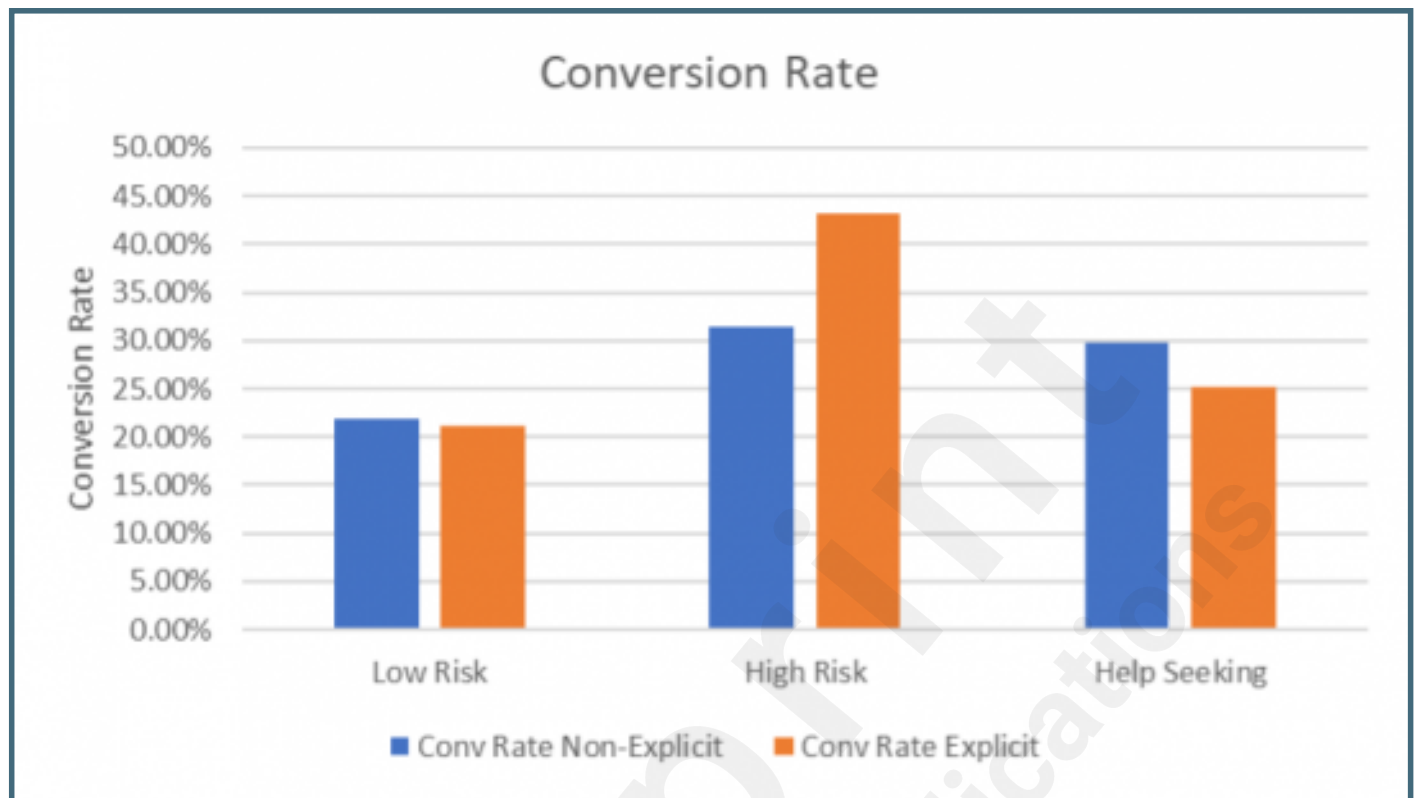
Schematic of Google Ads Campaign.



Click-Through Rate by Keyword Type and Condition. * denotes $p < .05$.



Conversion Rate by Keyword Type and Condition.



Total Conversion Rate by Keyword Type and Condition. * denotes $p < .05$.

