

Development of the RAFT (Reconnecting after a suicide attempt) SMS brief contact intervention

Mark Erik Larsen

Black Dog Institute, University
of New South Wales
Hospital Road, Randwick, NSW
2031, Australia
mark.larsen@blackdog.org.au

Fiona Shand

Black Dog Institute, University
of New South Wales
Hospital Road, Randwick, NSW
2031, Australia
fionas@unsw.edu.au

Kirsten Morley *

NHMRC Centre for Excellence
in Mental Health and Substance
Use, University of Sydney.
King George V Building,
Missenden Road, Camperdown,
NSW 2050, Australia.
kirsten.morley@sydney.edu.au

ABSTRACT

Continuity of care following discharge from hospital for a suicide attempt is critical, yet this is a time when individuals often lose contact with healthcare services. Brief contact interventions can reduce the number of repeat attempts, and text message interventions are currently being evaluated. We sought to extend post-attempt caring contacts by designing a brief online intervention targeting proximal risk factors and the needs of this population during the post-attempt period. A lived experience design group and clinical design group were established to inform the intervention design. Prompt outreach following discharge, initial distraction activities with low cognitive demands, and ongoing support over an extended period were identified as structural requirements of the intervention. Key content areas identified included coping with distressing feelings, safety planning, emotional regulation and acceptance, coping with suicidal thoughts, connecting with others/interpersonal relationships, and managing alcohol consumption. A pilot study to test the feasibility and acceptability of the RAFT intervention is underway.

Author Keywords

Suicide attempt; emergency department; brief intervention; text message

ACM Classification Keywords

H.5.2: User interfaces; J.3: Life and medical sciences; J.4: Social and behavioural sciences

INTRODUCTION

Hospital-treated deliberate self-harm (DSH) is the single

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strongest risk factor for subsequent suicide, and repeat episodes and suicide are key clinical outcomes [3]. With a one-year repetition rate of 15%, and 30% in those with a history of previous episodes [4, 16], engaging with and treating self-harming patients soon after they present to the emergency department (ED) is important for reducing future suicidal behaviour. The risk of repetition is highest in the first month after discharge, however the risk remains elevated for at least 12 months [4]. DSH tends to be predominately self-poisoning in method [8], and associated with suicidal ideation [9].

Ongoing care after discharge is critical, and a failure to provide rapid and effective follow-up after DSH is associated with increased risk of further DSH, repeat attempts, and suicide [13]. However, a data linkage study of 67,035 hospital-admitted DSH cases from 2005-2011 in the Australian state of New South Wales found that only 63% of patients received any mental health care within the public system following discharge [15], with only 41% having contact with a community mental health service in the month following discharge from an inpatient admission [17].

A meta-analysis found that brief contact interventions, such as letters, postcards, crisis cards and telephone calls, were associated with a significant reduction in the number of repeat episodes per participant, although non-significant reductions were observed in the number of patients with any repeat attempt [14]. In addition to showing promising clinical outcomes, brief contact interventions overcome some of the barriers to implementation of more intensive forms of after-care, including resource limitations and difficulty engaging patients in ongoing treatment. Therapy-based interventions are generally expensive and require delivery by mental health professionals within traditional services, making them difficult to implement and potentially hard to access. Further, a substantial number of patients are unable or unwilling to engage in face-to-face

* A full list of authors is detailed at the end of the manuscript.

treatment, but may be willing to engage with a lower intensity intervention.

Despite increasing interest in e-mental health interventions, including for suicide prevention [5, 10], such interventions rarely support individuals following a suicide attempt [11]. There is, however, an increasing research focus on technology-supported brief contact interventions, and simple “caring contact” text messages (SMS) are currently being trialled [1, 6]. We developed the RAFT (Reconnecting AFTer a suicide attempt) intervention to extend the scope of these text message contacts by including additional links to online brief therapeutic content targeting proximal risk factors. We report on the development of the intervention, which was co-designed with lived experience groups and an expert panel, and is designed for patients who have been recently discharged from the ED.

METHODS

Recognising the importance of lived experience in the implementation of this project, a lived experience design group was established to inform its design. Due to the broad range of individual experience, the established Centre for Research Excellence in Suicide Prevention’s Lived Experience Committee (CRESP LEC), and the Black Dog Institute’s Lived Experience Advisory Panel (BDI LEAP) were also consulted throughout the intervention design process.

The project-specific design group was recruited through the Black Dog Institute’s website and social media channels, through a research register of people who had previously consented to be contacted about research projects, as well as through partner organisations. Potential participants were asked to contact a member of the research team to screen for eligibility. Participants had a history of a suicide attempt, but not in the immediately preceding month, and not currently experiencing severe suicidal ideation (if a current suicide plan, means, or intent was endorsed). Eligibility was initially based on an age of 18 – 25, which was later broadened to 18 – 65. Ethics approval for the design group was obtained through the University of New South Wales Human Research Ethics Committee (HC14272).

Sixteen potential participants contacted the research team expressing interest in the lived experience design group, fourteen of whom were female. Five individuals were ineligible, due to current severe suicidal ideation (n=4) or a suicide attempt within the previous month (n=1). Four individuals were eligible, but could not attend a focus group due to scheduling constraints. The remaining seven eligible individuals were scheduled to attend two focus groups (comprised of three and four participants respectively), however three participants did not attend the second session, so this was conducted as a one-to-one interview with the one attending participant. All four design group participants were female.

A clinical design group was also established for this project, to capture a range of researcher and clinician perspectives. The five members of this group had expertise in e-mental health, clinical psychology, liaison psychiatry, emergency medicine, drug and alcohol services, and mental health epidemiology.

Design Process

The RAFT follow-up intervention was motivated from the Care After A Suicide Attempt report [15], which identified a gap in the provision of follow-up care following discharge from the emergency department following a suicide attempt, and the meta-analysis by Milner *et al.* [14], which identified brief contact interventions as a promising follow-up strategy. These led to the initial concept for a text message-based intervention. The lived experience design group was then convened to explore potentially helpful content for these messages, as well as the structure (for example, frequency of messages, and who should send them).

The discussions with the lived experience design group were synthesised and a high level design was created. Feedback on this design was obtained from the clinical design group, the CRESP LEC, and the BDI LEAP. Detailed content and user experience designs were developed, with an additional round of feedback from the clinical design group and the CRESP LEC. The finalised designs were then implemented, and the clinical design group and CRESP LEC invited to test the realised system.

RESULTS

Design Process

Our first discussions with the lived experience design group focussed on what help and support was available to participants following their suicide attempt, what was helpful and not helpful, what support they would have liked to have received, and the scope for incorporating such strategies into an ehealth intervention. During these initial discussions, the concept of follow-up by text messages was supported:

“I think it would have been useful to me ... I just needed any contact from anybody, and when I saw the system, and when I was told the system was supposed to respond in a certain way for 48 hours and they didn’t – it really hurt me.”

Compared to other forms of follow-up contact, text messages were broadly preferred:

“Generally speaking I quite appreciate phone calls, but I think after a suicide attempt I perhaps wouldn’t have appreciated that so much.”

However, it was acknowledged that some may not find such contact helpful, and indeed may be perceived as the:

“personification of a health system that sees you as a problem instead of a person.”

When asked about what techniques participants had found helpful following their suicide attempt, distraction activities such as games, drawing and colouring were described:

“where you can just play games as a way to keep yourself, your mind busy. I did have Sudoku books, which I did a lot of. And I did a lot of those dot paintings with textas”

Participants highlighted that these activities were typically low-intensity:

“not much energy either ... [an activity] that is achievable”

In addition to these short-term strategies, participants also identified longer-term support which was helpful following their suicide attempt:

“any sort of approach which looks at acceptance, and I mean, emotion regulation was very important for me”

Participants frequently described difficulties communicating with friends and family following their suicide attempt:

“My best friend at the time stopped talking to me for three weeks”

“one of the issues we all have in common is we have issues communicating with our parents”

When asked about the scheduling of messages, participants indicated frequent messages would be useful, but not *too* frequent:

“I think [the first message should be] the day after discharge”

“maybe every 2-3 days as the default ... I would say a maximum of a week because otherwise you’re not taking care of yourself enough”

“I’d say one a day, but that would probably get irritating too. So probably I’d do that for a few days, and then extend it”

Although the possible duration of messaging was not directly discussed, participants described a general need for longer-term care:

“our hospitals [are] very acute driven ... and they do that very well, but I think with mental illness, you need to get at the chronic illness, and how you manage that on a longer timeframe.”

“I think I may not have ever have got to the second [suicide attempt] if I had been cared for in a way that had a longer term vision.”

Based on the lived experience discussions described above, the following key topic areas were identified: initial distraction activities to cope with distressing feelings, emotional regulation and acceptance, and interpersonal relationships. The clinical design group expanded upon these areas to also include: safety planning, as part of a best-practice safety protocol; coping with suicidal thoughts, as an extension of emotional acceptance; and managing alcohol use, as this is a proximal risk factor. The needs for prompt outreach following discharge, initial content with low cognitive demands, and ongoing support over an extended period were also endorsed. To match this trajectory, an initial contact within 24 hours was proposed, followed by weekly messages related to the topics identified above, when monthly reminders until 12 months.

The content of the text messages and additional online content related to the identified topics was then drafted, with feedback obtained from the clinical design group and the CRESPP CC. Two proposed user interface wireframes were designed, with feedback also obtained from the clinical design group, CRESPP CC, and BDI LEAP. Following both sets of feedback, the specifications were finalised and the realised system is described below.

System Design

The aim of RAFT is to provide a text message-based follow-up intervention, combining regular SMS contacts and links to web-based therapeutic content and resources focused on the six content areas. These key areas, identified through thematic analysis, include: coping with distressing feelings, safety planning, emotional regulation and acceptance, coping with suicidal thoughts, connecting with others/interpersonal relationships, and managing alcohol consumption. The sequence of messages is intended to start with low cognitive demands for the early messages during the initial crisis period, with additional therapeutic components introduced later. Each SMS contains a brief message related to the content area, with a link to information and brief therapeutic content on the study website.

SMS Component

Upon registration, users automatically receive a series of personalised text messages at a pre-defined schedule. The first text message (coping with distressing feelings) is sent within 24 hours of user registration, with messages related to the other topics sent weekly until week six. Each message is customised with the recipient’s given name, and signed by the team from their presenting hospital. Messages also express the treating clinician’s wish that the person is well, and invite them to recontact their relevant local health service if needed. Each message also contains a unique link to the relevant online content – see Figure 1.

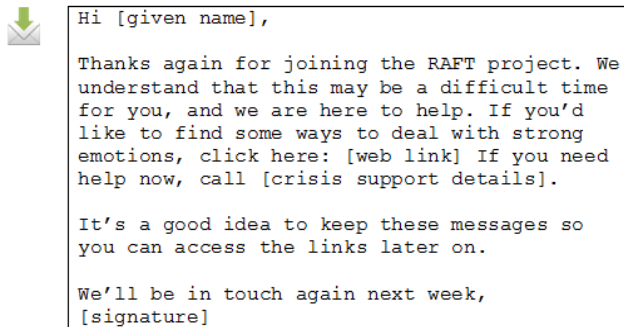


Figure 1. Example of the first text message (coping with distressing feelings). Customised text is shown in [square brackets].

Following the six weekly messages during this immediate post-discharge period, the participant then receives monthly reminder messages until just over 12 months have passed – see Figure 2. The final message is delayed slightly to avoid the anniversary date of the index presentation. These messages contain reminders to revisit the online content, or to contact a crisis service or a health professional if required.

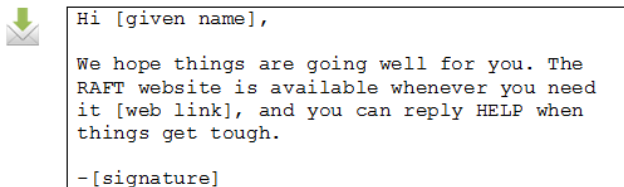


Figure 2. Example of a monthly reminder message. Customised text is shown in [square brackets].

As part of the safety protocol, participants can reply to any message at any time with the keyword “HELP”. This triggers an automated response containing contact details of their local acute care team, the national Lifeline crisis telephone line, and, if the participant feels in immediate danger, the emergency services (triple zero) – see Figure 3. The local acute care team is suggested as the first point-of-call to encourage appropriate triage to self-care or local health services. In addition to the “HELP” keyword, participants are able to opt-out of further participation at any time by replying “STOP” to stop receiving future messages.

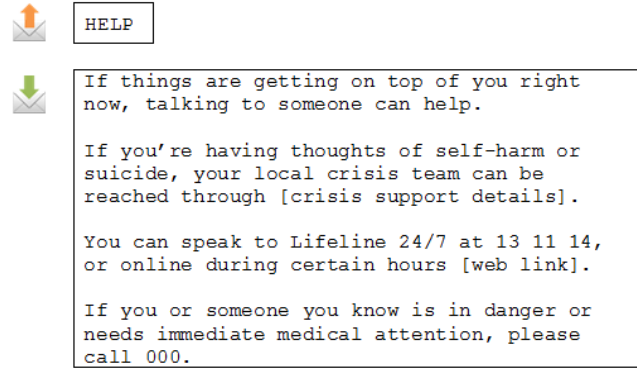


Figure 3. Example of automatic response to the HELP keyword, providing local crisis support, national crisis support, and emergency service details. Customised text is shown in [square brackets].

Web Component

If a user clicks on one of links contained within the text messages, the relevant content within the study website is loaded. The content for each of the six content areas is described below. Figure 4 show sample screenshots of the web-based content.

Day 0: Coping with distressing feelings

This section aims to help participants cope with the distressing feelings present in the immediate period following discharge from hospital. It attempts to normalise feelings of distress, and provides simple emotional regulation strategies including distraction and calming activities. It offers strategies that members of the lived experience design group found helpful, including links to other free apps and resources, and includes listening to music, engaging with art, practicing mindfulness, playing games, and colouring. Participants are also able to enter their own activities, and rate whether each activity is helpful for them.

Day 7: Safety planning

One week post-attempt, this section encourages participants to create a safety plan in case a crisis re-emerges. The rationale for a safety plan is described [18], and suggests that the participant can create one on their own, or with help from a friend or family member. Links are provided to a safety planning app or a downloadable document. The participant is reminded that activities they found useful from the previous section can be included in their safety plan.

Day 14: Emotional regulation and acceptance

After two weeks, additional brief therapeutic content is presented. This section is based on Acceptance and Commitment Therapy, and encourages learning acceptance of strong emotions and effective emotional regulation techniques. Links are provided to brief online mindfulness audio recordings for when the participant feels distressed,

while also balancing the need for active regulation – participants are again referred back to any activities from the first section they found useful.

Day 21: Coping with suicidal thoughts

After three weeks, the participant is introduced to cognitive strategies which may be useful if suicidal thoughts re-emerge. Thought de-fusion strategies are suggested, and presented as a case-study tailored to the participant’s gender. These strategies include recognition of unhelpful or “bully” thoughts, observing and naming these thoughts, and questioning their accuracy and utility.

Day 28: Connecting with others/interpersonal relationships

After four weeks, an additional case study is presented in relation to managing interpersonal relationships, and solving relationship difficulties. Helpful and unhelpful communication styles, thinking styles and interpersonal behaviours are highlighted, along with encouragement to apply these to the participant’s own relationships.

Day 35: Managing alcohol consumption

The final content area focuses on managing alcohol consumption, a proximal risk factor for suicidal behaviours. The section starts with the AUDIT-C screener [2], and if this indicates potentially harmful drinking behaviours the participant is encouraged to visit the Healthier Drinking Choices website, a localised Australian version of the Down Your Drink brief intervention [12].

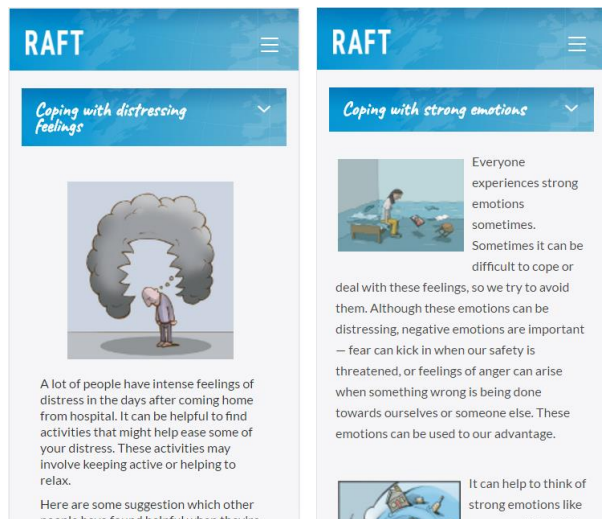


Figure 4. Sample screenshots from the webpages related to the first and third messages. Left: “Coping with distressing feelings” on day 0. Right: Emotional regulation and acceptance (“Coping with strong emotions”) on day 14.

Each webpage becomes available when the corresponding SMS is sent. Participants can browse back through earlier sections related to any previous messages, and are not required to view the content in sequence. To assess which content areas are most relevant, engagement with both the

SMS and web components of the intervention are automatically measured. Measures include the proportion of text messages which fail to deliver; whether participants withdraw or opt-out of future messages through the “STOP” keyword, and at what point; which links are most frequently clicked, and when; and which pages are viewed on the study website, how often, and when.

DISCUSSION

We have presented the consumer-informed development and design of the RAFT SMS-based brief contact intervention. RAFT extends existing text message brief contact interventions [1, 6] through the inclusion of links to online brief therapeutic content which the user can choose to access at any time. These links cover a range of factors, including coping with distressing feelings, safety planning, emotional regulation and acceptance, coping with suicidal thoughts, connecting with others/interpersonal relationships, and managing alcohol consumption. The intervention has been developed with extensive consultation with lived experience groups. To assess the feasibility and acceptability of the RAFT brief contact intervention, a 12-month pilot study is currently underway at three participating emergency departments across Australia.

Our design process identified some similar themes as those identified by Cooper *et al.* in their analysis of requirements for a brief contact intervention [7]. Common features include the need for proactive follow-up immediately following discharge from the emergency department, with messages of support and encouragement with relevant support contacts. Cooper *et al.* also identified some uncertainty about the optimal contact intensity and duration. We did not, however, identify reservations about the use of mobile phones as a contact method. This may be due to increased mobile phone adoption in the intervening years. Also, our advertising material mentioning the development of an ehealth intervention, therefore the design group participants in this study may have been more willing to accept a mobile phone-based strategy.

The RAFT intervention has been designed to be readily accessible to a large proportion of the population, and has the potential to readily scale to other clinical services and settings. Although designed for an Australian setting, the content and support services can be readily adapted for international settings. This brief intervention may also be more acceptable to a younger population, and those who are unable or unwilling to receive face-to-face treatment.

Limitations

A number of limitations are acknowledged in the development of the RAFT intervention. Firstly, the project-specific lived experience design group only contained four participants, and therefore it is unlikely that the experiences described represent the full range of lived experience. Furthermore, the group was exclusively female, possibly reflecting the gender disparity between suicide attempts and

completed suicides, and additional targeted recruitment attempts were unsuccessful. Therefore the acceptability for male participants is unclear, and will be determined through the pilot study.

Text messaging may be considered a relatively simple or old technology, particularly when compared to smartphone apps. However, apps may encounter a higher barrier to adoption in the emergency department setting, with limited feasibility for downloading and installing an app during the routine discharge process. Text messaging is also available to a larger proportion of the population, including lower income participants who may not own a modern smartphone, although the online content may not be fully accessible to these participants. The messaging infrastructure also allows for longer term automatic deployment with fewer ongoing maintenance and update requirements than an app.

The automated text messages proposed in this system may be perceived by some as an extension of a healthcare system that doesn't care, as described by one participant. Other participants, however, described that any follow-up would be appreciated, especially as personal follow-up is often promised but not always delivered. It may be possible to extend this automated SMS system with additional keyword responses, for example the "HELP" message could trigger a follow-up phone call from a crisis service.

CONCLUSIONS

We have developed a new text message-based brief contact intervention, delivered over 12 months following an emergency department presentation for a suicide attempt, which expands previous caring contact interventions with additional online brief therapeutic content. Such an approach has the potential to reduce the number of repeat episodes of suicidal behaviour, and to reach young people at risk of self-harm and suicide who are unable or unwilling to undergo face-to-face treatment with health professionals. Our pilot study aims to assess the acceptability and feasibility of delivering this intervention through an emergency department setting. Widespread mobile phone technology allows RAFT to be readily deployed at scale, and is likely to be more acceptable to a younger target audience than alternative clinical therapeutic options.

AUTHORS

Mark Erik Larsen, mark.larsen@blackdog.org.au
Fiona Shand, fionas@unsw.edu.au
Kirsten Morley, kirsten.morley@sydney.edu.au
Philip Batterham, philip.batterham@anu.edu.au
Katherine Petrie, katherine.petrie@unsw.edu.au
Bill Reda, b.reda@unsw.edu.au
Sofian Berrouiguet, sofian.berrouiguet@chu-brest.fr
Paul Haber, paul.haber@sydney.edu.au
Greg Carter, gregory.carter@newcastle.edu.au
Helen Christensen, h.christensen@blackdog.org.au

MEL, FS, KP, BR and HC are with Black Dog Institute, University of New South Wales. Hospital Road, Randwick, NSW 2031, Australia.

KM and PH are with the NHMRC Centre for Excellence in Mental Health and Substance Use, University of Sydney. King George V Building, Royal Prince Alfred Hospital, Missenden Road, Camperdown, NSW 2050, Australia.

PB is with the National Institute for Mental Health Research, Australian National University, Australia. Building 63, Canberra, ACT 2601, Australia.

SB is with the Centre Hospitalier Régional Universitaire de Brest, Hopital de Bohars. Route de Ploudalmézeau, 29820 Bohars, France.

GC is with the Centre for Brain and Mental Health Research, University of Newcastle. Locked Bag #7, Hunter Regional Mail Centre, NSW 2310, Australia.

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