Pilot and Feasibility Studies

RESEARCH

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Recruitment rates, retention rates, and follow-up completion in a Brief Intervention and Contact trial for suicidal behavior: a feasibility study

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Abstract

Background Suicide is a serious public health concern for which there are limited evidence-based interventions being employed. This feasibility study administered a Brief Intervention and Contact (BIC) trial adopted from the WHO Multisite Intervention Study on Suicidal Behaviors (SUPRE-MISS) and followed participants after they had been discharged from the inpatient hospital setting.

Aims To assess the recruitment and retention rates, follow-up visit completion, barriers to recruitment and retention, resources needed of employing this study, and data completion.

Methods Eligible participants were recruited from psychiatric inpatient settings, in Hamilton, Ontario. Adults with suicidal behavior were randomly allocated to BIC (intervention) plus treatment as usual (TAU) or treatment as usual (control) and were followed for 6 months. The intervention arm completed 9 follow-up points during the 6-month follow-up period post-discharge. Calculation of recruitment and retention rates and associated statistical analyses were completed using SPSS version 25.

Results A total of 154 participants were approached during the 8-month recruitment period, 60 participants were enrolled resulting in a recruitment rate of 7.625 participants per month. A total of 61 participants were recruited, with 1 duplicate. The retention rate was 47.5% for the recruited participants at the end of the study.

Conclusions Few suicide-based follow up interventions assess the feasibility of conducting the study. Retention was low for this study; however, participants outlined reasons for withdrawal that are consistent with other research areas related to mental health. Findings from this study will help inform suicide research on the barriers and challenges to participant recruitment and retention.

Trial registration NCT03825354, Registered January 30 th, 2019, ClinicalTrial.gov; https://clinicaltrials.gov/study/NCT03825354?cond=suicide&term=brief%20intervention%20and%20contact&rank=6

Keywords Suicide, Brief intervention, Feasibility, Follow-up

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Key messages regarding feasibility

1) What uncertainties existed regarding the feasibility?

   - There is uncertainty of whether changes to retentions strategies such as warm transfers and other communication strategies will increase retention at the first point of contact post-discharge.
   - There is uncertainty of whether modifying data collection methods to be more semi-structured will encourage participation.

2) What are the key feasibility findings?

   - The highest lost to follow-up rates were seen in the first point of contact post-discharge.
   - Retention barriers included no specific reason for discontinuation, lack of continued interest, and refusal of further contact.

3) What are the implications of the feasibility findings for the design of the main study?

   - Resources that help establish communication may be needed to ensure this first point of contact is met. Also, a warm transfer may need to be conducted to remind and inform the participant that they will be receiving calls post-discharge.
   - Follow-up visits are meant to be an intervention and may need to be more flexible to maintain participant interest and engagement. It may also be necessary to make the follow-up questionnaires semi-structured in nature as the open-ended questions may be helpful and person focused for participants and may encourage them to continue their participation in the study.

Background

Suicide is a significant public health concern and causes approximately 1.5% of all deaths in the general population in Canada. Alongside significant economic burden, suicide has substantial impacts at the familial level, with surviving family members experiencing adverse mental health and functional problems as a result [1–3].

Research shows that the period shortly after an attempt is associated with the highest risk of re-attempts, and consequently, the post-discharge period provides an opportunity to follow-up and connect with patients exhibiting suicidal behavior and provide them with support [4, 5] However, individuals with suicidal behavior or attempts have poor treatment attendance and/or retention, especially in the first week after discharge [6]. While further research is needed to delineate the reasons for lower help-seeking behavior following a suicide attempt, a significant contributor is believed to be stigma related to suicide and severe mental illness. In particular, those that attempt suicide, are more likely to see themselves as attention-seeking, weak, and/or selfish, which may dissuade seeking help from their social network or health care professionals [7, 8]. Stigma against mental illness is associated with reduced self-esteem and self-efficacy, which can increase social withdrawal and result in reduced help-seeking behavior and adherence to treatment [9, 10]. Suicidal ideation is often viewed with greater stigma, largely because it is seen as an extreme outcome of mental illness, and harder to treat compared to other mental health disorders [11]. A recent study has shown a significant association between shame and self-stigma with higher suicide rates in a country, suggesting that addressing stigma associated with suicide may reduce suicide rates by making it more acceptable to talk about, and seek help for suicide [12, 13]. Specifically, suicide literacy and talking about suicide have been seen to reduce the stigma of suicide and associated misconceptions surrounding suicide in multiple communities [14–16]. As such, investigating and promoting the engagement of patients with suicidal behavior with appropriate mental health services can inform suicide intervention strategies that are effective in reducing suicide rates.

Exploration of factors affecting the engagement of patients with suicidal behavior is particularly relevant for this study, which involved randomizing patients admitted for suicidal attempts and/or ideations to Brief Intervention and Contact (BIC) to maintain communication with them post-discharge with the goal of suicide prevention. BIC is an intervention strategy that aims to create a safe, stigma-averse, space for those who have attempted suicide. It is rooted in strategies that increase suicide literacy, actioned by offering information about the etiology of suicide to participants, and provide a safe space for communication about suicide, actioned by weekly follow-up calls post-discharge. The study design was modelled after the WHO Multisite Intervention Study On Suicidal Behaviors (SUPRE-MISS) trial which implemented BIC in many different studies, and found that compared to patients in the control group, there was a reduction in suicide rates (death by suicide) in patients who received the BIC intervention [17].

The BIC model was informed by research that found that alongside usual treatment, follow-up with discharged patients through text messaging, phone calls and letters, contributes to a reduction in completed and attempted suicide, and instances of self-harm [18–21].

Objectives

Feasibility studies are done prior to the main trial, to estimate important parameters that are needed to design a larger study. These include recruitment and retention rates, barriers to recruitment of eligible patients, barriers to implementation of intervention, follow-up rates, response rates and data completion rates for questionnaires, and resources needed for a successful implementation of the intervention [22].

As such, the objectives of this feasibility trial are to examine factors affecting recruitment, retention, and follow-up completion in a BIC program executed in a Canadian setting for recently discharged psychiatric inpatients.

1. Assess the feasibility of the study process in terms of
    a Recruitment and retention rates,
    b Follow-up visit completion
    c Barriers to recruitment and retention
    d Resources needed for the implementation of intervention
    e And data completion
2. Assess resources needed including the use of mobile phones for contacting patients, interview spaces for initial intake questionnaire and consent processes.

Methods

We conducted a feasibility and pilot study centered around the BIC intervention. In this paper, we elaborate on and provide the results for our specified feasibility objectives. Pilot objectives will be reported on a separate, complementary paper. For the methods section, we largely refer to this trial as a feasibility and pilot trial, apart from the section outlining the feasibility specific outcomes.

Reporting

This paper and abstract was reported using the CONSORT 2010 guidelines [22]. The CONSORT extension statement checklist for feasibility and pilot studies was used to ensure complete and transparent reporting (see Fig. 1).

Feasibility and pilot trial design

The feasibility and pilot study is an open-label pragmatic randomized trial. The intake and follow-up questionnaires included gathering data on sociodemographic variables, recruitment rate, data completion, retention in the trial, and changes in clinical indicators of mood and well-being and self-report scales. The feasibility and pilot pragmatic randomized controlled trial study design is a parallel 1:1 allocation comparing BIC in addition to TAU to only TAU in the control condition. For this study, we adopted the following principals simulating naturalistic real-life clinical setting to test the study question based on the pragmatic design: [23, 24]

1. No restrictive inclusion criteria were used. Adults presenting with a previous suicide attempt or suicidal behavior were asked to participate in this study,
2. Clinicians and trained research personnel delivered the BIC program to participants randomized to receive the intervention,
3. The intervention was an add-on to TAU,
4. The comparison group received TAU which included but was not limited to medications, psychotherapy, psychiatric follow up and other therapies as required and decided by their clinical care,
5. Most primary and secondary study outcomes were patient-important (reduction in further suicide attempts, and improvement in depressive symptoms and social connectivity),
6. There were no measures to improve adherence to the study intervention or the comparator.

Participants

Patients were recruited from inpatient units at a tertiary psychiatric hospital in Canada. All patients with a previous suicide attempt or who have expressed any suicidal behavior were eligible to participate. Inclusion criteria included: 16 years of age or older; ability to provide informed consent; ability to be reached through phone calls and/or text message or in-person visits to the hospital site; and admitted to an inpatient psychiatric unit. Patients were excluded if they were unable to understand written and spoken English as the research staff/clinicians delivering the intervention are limited to English-speaking populations. No restrictions were placed on the patients' diagnoses or comorbidities, and all psychiatric diagnoses were documented.

Potential participants were approached by clinicians with direct clinical contact with potential participants, or by research staff with guidance and referrals from clinicians in various psychiatric inpatient units. We received referrals from clinical staff treating the patients following the identification of suicidal ideation or behavior by the clinical team's assessment. We also asked the participant whether they have suicidal ideation at the time of assessment to confirm the eligibility for the study. Patients were approached by research staff for initial screening for eligibility, and then the study purpose, procedure, and potential benefits were explained. Patients were asked to

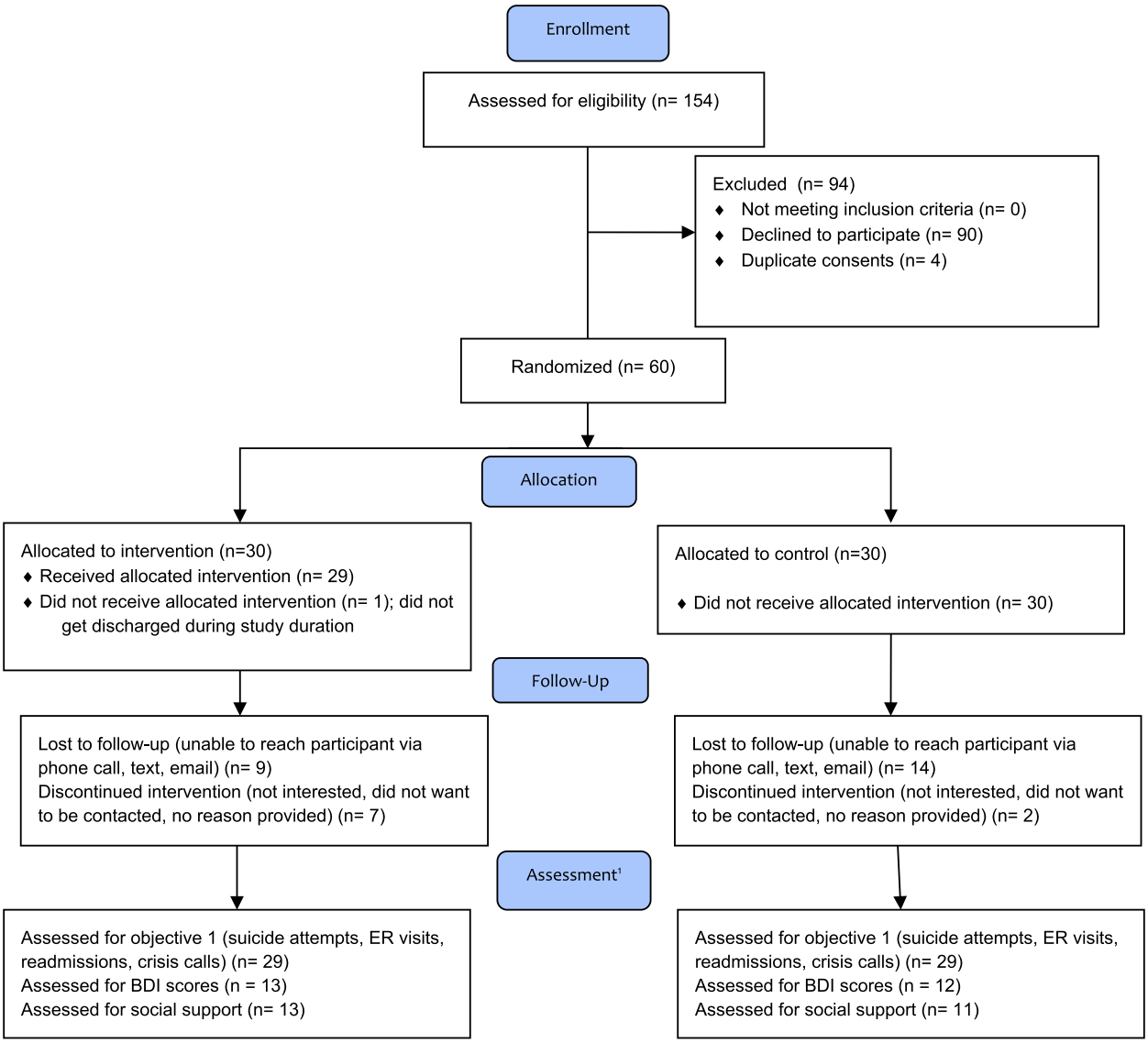

Fig. 1 CONSORT feasibility and pilot trial flow diagram for the BIC study. [1]The objectives included in the assessment portion of the diagram will be discussed and reported on in a paper investigating the primary and secondary objectives of the pilot trial. Assessment for objective 1 completed through medical records. Assessment for BDI and social support completed through interviews with participants

provide written informed consent prior to starting any study-related procedures if they wished to participate. Participants were not provided with any reimbursements (monetary or otherwise) for their involvement. After patients provided consent, they completed intake questionnaires immediately or were scheduled for another day based on their time and preference. Intake questionnaires consisted of various depression, social support and suicide-related scales as part of the WHO SUPRE-MISS trial and were completed by trained research team members. The intake process took about 1–1.5 h to complete. Following recruitment, patients were randomized. At the end of the intervention period, both intervention and control groups underwent end of the study questionnaires that consisted of the same scales as the intake questionnaire.

Recruitment began in April 2019, and finished in November 2019, and the follow-up period occurred between April 2019 and September 2020 after participants were discharged from the hospital. This study reports on all data collected throughout the study. Simple logs were designed to keep track of the number of individuals approached, number declined, and number excluded and reasons for exclusion such as languages

other than English, or not having means to be contacted post-discharge. Additionally, reasons for discontinuing the study or deciding not to participate were recorded from the beginning of the study.

Sample size

For the feasibility and the pilot trial, we aimed to recruit 30 patients in each arm, under the assumption that some participants would be lost to follow-up. This number was based on recommended guidelines for sample sizes for feasibility and pilot studies being about 10–15% of the sample used in a larger scale study [25]. Specifically, recruiting $N = 30$ and expecting to retain 25 participants, retention of 83% can be estimated to within 10% with 95% confidence. Based on previous implementations of BIC in which about 250–300 patients were recruited in each arm, this feasibility and pilot study aimed accordingly have 25 patients in each arm for the full duration of the intervention. This sample size was chosen to investigate the extent of loss to follow up (retention rate) within an acceptable margin of error in this population. These findings will help determine the appropriate sample size for a larger trial by providing more precise estimates of expected retention rate and ensure the standard deviations of potential primary outcomes for the future trial, such as the number of suicide attempts, are estimated with adequate precision [26, 27].

Randomization

Allocation and randomization

We employed a parallel group design to test the feasibility of the BIC program in suicidal behavior. Eligible and consenting patients were randomly allocated to the intervention or control arms using a 1:1 allocation ratio. Allocations were randomly assigned using a block randomization system of 4. A research assistant not involved in either arm of the study allocated the participants based on the randomization system provided.

Blinding and concealment of randomization

This feasibility and pilot trial was an open label trial as blinding was not possible for participants, and research personnel administering the intervention. The clinicians and staff recruiting and referring patients, the participants at the time of enrolment (signed consent and intake questionnaire completed) and the clinicians and research staff providing the BIC intervention or the control groups had no knowledge of the allocation prior to the start of the first intervention or control groups. Allocation concealment was ensured by assigning study ID numbers to all participants at the time of enrolment and before randomization. These assigned ID numbers with no other identifiers were then randomized to the intervention or control using an online randomization program [28].

Data collection

Data for this study were collected at psychiatric hospital in Hamilton, Ontario, from April 2019 until November 2019. Participants for this study were recruited from three inpatient psychiatric units: acute, concurrent (psychiatric and addiction disorders), and mood disorders.

The participants were given a baseline questionnaire and a final 6-month questionnaire after the BIC intervention was completed. These questions were organized based on psychometric tools, with each tool responsible for measuring a single outcome corresponding to the participants' overall health. Various scales (including the BDI-II, Bille-Brahe Social Support Scale, and the SSSQ (short-form)) were included to measure the outlined outcomes. The participants' responses were recorded on a specifically designed case report form (CRF), which was managed on REDCap [29]. Data for the baseline questionnaire were collected while the participants were admitted and was conducted in-person. The intervention began when the participants were discharged. Data for the 9 follow-ups completed with the intervention arm were collected over the phone, text messages, or email. The participants were contacted 6-months post-discharge to complete the final questionnaire, which was completed over the phone, text message, or email (self-administered).

Intervention

Participants in the intervention group received the BIC intervention, alongside treatment as usual (TAU). BIC consisted of a 1-h information session about the epidemiology and presentation of suicide and suicidal behavior at the time of discharge, along with follow-up with patients at 1, 2, 4, 6 weeks, and 2, 3, 4, 5, and 6 months. Follow-up contact involved assessing how participants feel, whether they need additional support, and whether a subsequent suicide attempt had occurred post-discharge. The information session and follow-up questionnaire were adopted from the WHO protocol on BIC [17].

Control

Participants in the control group received TAU. TAU was decided on by the participant's clinical team and included, but was not limited to, medication, psychotherapy outpatient follow up, family physician follow-up and community-based support.

Pilot trial—outcomes

The pilot trial's primary outcomes involve the collection of data to investigate the participant's subsequent suicide attempts, Emergency Department visits, hospital readmissions, and crisis service use. These outcomes will be reported and discussed in a separate paper on the pilot trial objectives and outcomes.

Trial feasibility—outcomes

Trial feasibility—participant recruitment rate and retention rate

The recruitment rate is defined as the proportion of participants who met inclusion criteria for the feasibility trial and consented to participate in the study from all participants who were approached and met inclusion criteria. Research personnel involved in the recruitment process documented this information on an enrolment log.

The retention rate is defined as the proportion of participants who completed the BIC intervention until the end of the study period, including completing all follow-up visits and the end of study questionnaire for those in the intervention arm, from all participants who were recruited into the study and completed the baseline questionnaire. Research personnel involved in conducting follow-up visits documented this information on an enrolment log.

Trial feasibility—follow-up visit completion

Primary and secondary outcomes for the feasibility trial were collected during follow-up visits and the end of study questionnaire for participants in the intervention arm, and the end of study questionnaire only for the control arm. There was a total of nine follow-up visits, not including the baseline and end of study questionnaire for the BIC intervention. Follow-up visit completion is defined by the proportion of participants that completed a follow-up visit for a specific visit from the total number of participants still in the study in that arm.

Trial feasibility—barriers to recruitment and retention

Reasons for not consenting to participate in the feasibility trial from participants that met inclusion criteria were collected throughout the recruitment process by research personnel. Similarly, research personnel recorded reasons for discontinuing with the study from participants that formally withdrew consent at any point after completing the baseline questionnaire. This information was not collected from participants lost-to-follow up (i.e., unable to be contacted by text message, phone call, or email).

Trial feasibility—resources needed for the implementation of intervention

Information about resources needed for the feasibility trial were collected during the study period, and through informal discussion and reflection with research staff following the completion of the feasibility trial. Types of resources that were considered included: number and type of research personnel needed for study processes, time put in by research personnel, administrative and data collection tools, and non-staff resources.

Trial feasibility—data completion

Data were collected from participants at baseline, nine follow-up visits, and the end of study questionnaire in the intervention arm, and at baseline and end of study questionnaires for participants in the control arm. Data completion is defined as the proportion of completed questionnaires at baseline, follow-up visits in intervention arm, and point of exit for participants still enrolled in the study. Additionally, data completion also includes data collected from medical record extraction for participants in both the intervention and control arm, including participants lost to follow-up.

Statistical analysis

Recruitment rate was defined as the proportion of participants who participated in the study when approached compared to the total number of participants approached. Retention rate was defined as the proportion of participants who did not withdraw consent from the study compared to the total number of enrolled participants. The follow-up rate was determined by comparing the number of completed follow-ups for a particular time point with the number of scheduled follow-ups for that time point [30].

As part of the secondary analysis, mean age and sex were compared between participants and non-participants, as well as between patients who remained in the study and those who did not remain in the study. Two-tailed independent samples t-test and Pearson $\chi 2$ test were used for comparing age and sex respectively. The Statistical Package for Social Sciences Version 25 was used for this comparison and statistical significance was set at $a = 0.05$ [31].

Results

Participant recruitment and retention rates

Between April 2019 and November 2019, 61 participants were recruited into the feasibility study, including 1 duplicate leaving 60 unique participants. A total of 154 participants were approached regarding the study and 41.5% consented and 58.4% declined to participate. Of those recruited, 9 withdrew (14.7%) and 23 were unable

Table 1 Demographic characteristics of participants approached and recruited

	Consented ($n = 64$)[1]			Declined ($n = 90$)	Statistic
Mean age (SD)	39.5 (14.3)			39.5 (14.3)[2]	$t = 0.017$[1] $p = 0.682$
% Female	59.4			57.1[3]	$\chi^2 = 0.074$[1] $p = 0.785$
Recruitment rate (participants per month)	7.625 participants per month				
	Remained in study		Did not remain in study		Statistic[5]
	Completed study ($n = 28$)	Still Admitted ($n = 1$)	Withdrew from study ($n = 9$)	Loss to follow up ($n = 23$)[4]	
Mean age (SD)	36.5 (13.5)	69	42.7 (16.1)	38.1 (13.7)	$t = 0.490$[4] $p = 0.923$
% Female	60.7	100	44.4	45.5	$\chi^2 = 1.721$[4] $p = 0.190$
Retention rate	47.5% of participants remained at the end of study				

[1] One duplicates and two individuals who were approached twice resulted a total of 61 participants recruited

[2] A total of 74 people had age reported; 16 entries were missing data on age

[3] A total of 84 people had sex reported; 6 entries were missing data on sex

[4] Information on 22 participants was collected due to one participant being lost to follow-up before initial interview was completed

[5] Statistic compared those who remained in study with those who did not remain in study

to be contacted due to a loss to follow-up (37.7%). However, the 23 participants lost to follow-up were still followed through their medical records (with consent obtained from all participants to review medical records for the purpose of the study) to determine hospitalizations and attempted or completed suicide post discharge during the study follow up period. Please see Table 1 for a demographic comparison between participants and non-participants, including those that declined, withdrew, and were a loss to follow-up. There were no statistically significant differences in age or sex between groups. A more detailed demographic and clinical profile of the recruited participants are shown in Table 2. Both groups had similar rates of psychiatric diagnoses, previous suicide attempts, and demographic factors. There were no other reported harms of this intervention.

Follow-up visit completion

There was a total of 9 follow-up points outlined in the intervention arm of the study. The highest number of follow-ups completed was at the 5-month period where a total of 48.4% of follow-ups were completed. The lowest number of follow-ups were completed at week 1 where a total of 25.8% of follow-ups were completed. Please see Fig. 2 for a detailed overview of the number of follow-ups completed and the associated percentages.

Table 2 Demographic and clinical characteristics of recruited participants

	Total ($n = 60$)	**Intervention ($n = 30$)**	**Control ($n = 30$)**
Sex; % male	45.9%	41.9%	50.0%
Mean age (S.D.)	38.6 (14.4)	39.4 (13.9)	37.7 (13.9)
Marital status; % without a partner	85.2%	77.4%	93.3%
Employment status; % currently employed	31.1%	29.0%	33.3%
Mean years of education (S.D)	14.9 (2.5)	14.7 (2.5)	15.1 (2.6)
Psychiatric diagnoses; % with a diagnosis[1]	97.7%	100%	93.3%
Major depressive disorder	55%	60.0%	50.0%
Substance use disorder[2]	28.3%	26.7%	30.0%
Borderline personality disorder	35%	33.3	36.7%
Bipolar disorder I/II	18.3%	13.3%	23.3%
Suicide attempt; % with previous attempt	27.9%	25.8%	30.0%

[1] Participants may have more than one concurrent diagnosis not specified in this table that was obtained from their medical chart

[2] Substances mentioned included alcohol, cocaine, cannabis, stimulants

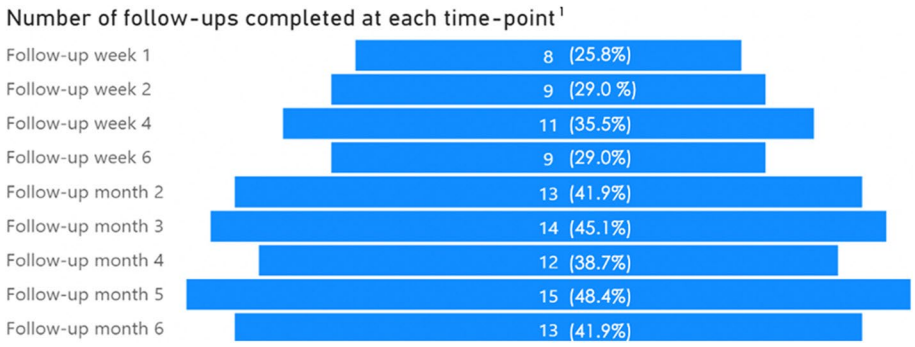

Fig. 2 Follow-up completion at each recorded time point in the intervention arm of the study. [1]Percentages were calculated out of the total number of scheduled follow-ups ($n = 31$), including follow-ups scheduled for withdrawn or loss to follow up participants

Table 3 Reasons for declining participation in the study

Reasons for declining	Examples	Number of participants ($n = 90$)
Not interested	• "Not interested"	36 (40%)
Not enough time to participate	• "Not enough time to participate" • "Too busy to participate" • "Doctor's appointment"	4 (4.4%)
Ask another time	• "Ask next time, has to go off the unit" • "Ask another day" • "Come back next time"	14 (15.5%)
Does not apply to participant	• "Doesn't need the intervention" • "Does not have suicidal ideation"	6 (6.7%)
Too unwell to participate	• "Does not feel well" • "Too tired to participate" • "Too overwhelmed to participate" • "Not a good time" • "Not comfortable enough to participate" • "Not ready to participate"	22 (24.4%)
Unsure about participating	• "Unsure about participating"	3 (3.3%)
Tired of doing studies	• "tired of doing studies" • "takes too long"	2 (2.2%)
No reason provided		3 (3.3%)

Table 4 Reasons for withdrawing consent from the study

Reasons for withdrawing	Number of participants ($n = 9$)
Does not want to be contacted	2 (22.2%)
Not interested	2 (22.2%)
No reason provided	5 (55.6%)

Barriers to recruitment and retention

Table 3 outlines the reasons provided by individuals for not participating in the study ($n = 90$). The most common reason was a lack of interest (40%). This is followed by 24.4% of participants reported not being well enough to participate in the study at the time of recruitment. The least frequent responses included individuals being too busy or not having enough time to participate (4.4%), individuals being unsure about participating (3.3%), and individuals stating they are tired of doing studies (2.2%). A total of 3.3% of individuals did not provide a reason for declining to participate.

Table 4 outlines the reasons participants identified for withdrawing from the study ($n = 9$). The most common response for withdrawing from the study was that participants did not wish to be contacted (22.2%) and that they were not interested (22.2%). Most participants stated no reason for withdrawing, they simply stated that they wanted to withdraw from the study (55.6%). Most participants in the intervention group either withdrew or were a loss to follow-up before the

Table 5 Time point where loss of participant occurred

Timepoint where participant was lost	Number of participants in intervention arm		Number of participants in control arm	
	Loss to follow-up ($n=9$)	Withdrew ($n=7$)	Loss to follow-up ($n=14$)	Withdrew ($n=2$)
Follow-up week 1	66.7%	85.7%	0%	0%
Follow-up week 2	0%	0%	0%	0%
Follow-up week 4	0%	0%	0%	0%
Follow-up week 6	11.1%	0%	0%	0%
Follow-up month 2	0%	0%	0%	0%
Follow-up month 3	0%	14.3%	0%	0%
Follow-up month 4	0%	0%	0%	0%
Follow-up month 5	0%	0%	0%	0%
Follow-up month 6	22.2%	0%	100%	100%

intervention began (loss to follow up 66.7%; withdrew 85.7%). Most participants in the control arm were loss to follow-up at month 6. It is important to note that follow-ups were only completed with the intervention arm, and control arm participants were contacted solely for the intake and 6-month final follow-up questionnaire. Please see Table 5 for more detail regarding the time points at which participants were lost to follow-up from the study.

Resources needed for the implementation of intervention

To recruit the 60 participants for this feasibility study, a total of 3 personnel recruited on a regular basis for a collective total of 4–6 h per week. A total of 2 personnel regularly conducted follow-up phone calls with participants collectively spending about a total of 8–10 h per week. Following discharge patient received an "after visit summary" as per routine clinical procedures to provide patients with follow up contact information, medications list and treating team. The after-visit-summaries were collected by one study personnel who is also a healthcare professional, as they had access to participant medical charts with consent and were able to print the documents for the study team. This study personnel were also responsible for extracting information from the participant medical charts that aligned with the outcomes outlined in the feasibility study, such as emergency department visits and crisis calls. The extraction of information from medical charts took the individual about 2 h per week. To conduct the post discharge study contacts, study personnel had a mobile phone set up with a number designated to the study. Study personnel also needed online access to REDCap to record the information collected from participants into pre-designed forms made using the software.

Data completion

The baseline questionnaire was completed for all but one participant in the intervention arm as seen in Table 6. A similar number of participants completed the final questionnaire (intervention 45.2%; control 46.7%). Medical record data were available for 93.5% of participants in the intervention arm and 96.7% of participants in the control arm. Medical record data were not collected from one participant who was still inpatient at the time of the study completion.

Summary of evidence

The recruitment rate was 41.5%, with 154 participants approached to participate, and 64 consenting. It is challenging to contextualize this rate because there is little available research regarding expected recruitment and engagement of potential participants for studies involving patients with suicidal behavior. When comparing this recruitment rate against other studies involving brief contact interventions for suicidal patients, it is a little lower than expected [17, 32]. However, many other studies involving brief contact interventions for a suicide behavior population did not report their recruitment rate [32–34]. Consequently, it is difficult to determine whether our rate was truly below what is expected. Furthermore, of the studies reporting their recruitment rate, participants were recruited from the Emergency Department (ED) before discharge, whereas our participants were recruited from inpatient wards, suggesting they may be more severe cases (admitted versus seen in ED and discharged). There were several reasons provided by participants for not consenting, with the most common reasons including lack of interest (40.0%), feeling too unwell to participate (24.4%), and asking to be approached another day (15.5%). While lack of interest is the most significant reason for nonparticipation in our study, other research exploring barriers to research participation in mental

Table 6 Completion of the intake and final questionnaires, and completion of medical record data extraction

	Intervention ($n = 31$)	Control ($n = 30$)
Completion of baseline questionnaire (%)	96.7	100
Completion of final questionnaire (%)	45.2	46.7
Medical record data collection completion (%)	93.5	96.7

health and general health research found a much more diverse selection of reasons, with lack of interest being minimal [35, 36]. This suggests that a greater percentage of approached patients in our study may have other causes for not participating, such as feeling too unwell to participate, but may have hesitated to disclose more personal reasons as suggested by social desirability bias. There were no statistically significant differences in age or sex between participants and non-participants. While the literature is lacking on regarding whether there exists a difference between non-participants and participants in suicide-related research, some studies have explored barriers to recruiting certain populations such as older males [37]. This suggests that our study did not face this barrier during recruitment, but may have faced this barrier when examining those who did remain in the study compared to those who did not. More specifically, a higher percentage of males did not remain in the study, echoing the barriers to recruitment mentioned in literature.

A total of 28 participants completed the study and 1 participant was not discharged by the end of the study period, with an overall retention rate of 47.5%. Nine participants withdrew from the study and 23 participants were lost to follow up. Of the participants lost to follow-up, the majority could not be contacted for the first follow-up, which occurs 1-week post-discharge. This suggests that participants for whom the initial follow-up was completed were unlikely to be lost to follow-up. This highlights the importance of completing the first point of contact post-discharge with a participant, an action supported by suicide literature which provides evidence that the first point of contact is essential for retention of participants who have previously attempted suicide [6]. Additionally, the lowest number of follow-ups were completed at the beginning of the study, with steady increases in follow-up completion seen as the time post-discharge increased. Consequently, future BIC-based programs may need to prioritize providing technology and communication resources to participants to ensure that they can be contacted post-discharge. More specifically, suicide is prevalent in the homeless population and other populations that have limited access to resources [38, 39]. Also, research has shown that a lack of fixed residence or social support network greatly impacts attrition in intervention-based studies [40]. As such, it is important for the program to consider resource allocation and social support networks when thinking about effective solutions to increase retention. An example of providing participants with resources includes a community voicemail program that would allow individuals without phones or permanent home addresses to have access to a free, personal voicemail service [40]. Future BIC based programs may also want to consider adopting the clinical idea of a warm transfer to increase retention rates. A warm transfer would incorporate the clinical team and allow them to remind participants that they will be receiving a call from the BIC research study after they have been discharged rather than cold calling the participant once they have been discharged. This warm transfer has been seen to help retain patients being transferred from inpatient to outpatient care and has been seen to limit the number of participants lost in the transferring process [41, 42].

Comparatively, about 22% of loss to follow up occurred at the end of the study in the intervention arm. This may be attributed to the length of the final questionnaire (1–1.5 h), which may have added to participant burden. Future directions should include the refinement of study collection instruments or offering participants the possibility of staggering questionnaires over a certain period of time, in order to lessen the burden on the participant and increase retention rates. This is similarly discussed in other studies that focus on increasing engagement and retention of participants in suicide-related research, with communication and contact-based problems occurring when attempting to longitudinally follow these participants [40, 43]. Future directions to increase retention at contact points near the end of the study may include reimbursement incentives that can be provided to participants when they attend appointments and for their continued participation [44].

The three main causes of loss to follow-up included not wanting to be contacted anymore, a lack of interest in continuing, and most commonly, no reason was provided. In general, most of the reasons provided for discontinuing with the study are non-specific. It is possible that some of the reasons that impacted recruitment also apply here, namely feeling too unwell to participate, or being busier with other responsibilities. Research indicates that lower level of functioning is a risk factor for treatment attrition in suicide-related clinical service

[45]. In understanding reasons for lack of retention, it is possible that a lack of monetary or other forms of reimbursement of participant time and effort impacted their interest in continuing, as has been found in general research that explores factors that impact retention in longitudinal behavioral research [44, 46]. Additionally, as the intake process consisted of up to 2-h session of interviewing and administration of many standardized questionnaires, the remainder of the study may have felt too tiring and intrusive to continue with, which has been an issue in other mental health related research [47]. This also reflects the fluctuating course of mental illnesses, as illness severity and fear of exacerbating illness have contributed to poor follow-up in other psychiatric research [35]. However, considering that all parts of the study after the intake questionnaire are meant to be an intervention, it suggests that the follow-up visits may need to be more person-centred and unstructured, with a focus on an organic and less script-based conversation. This is supported by qualitative research that suggests that participants find it helpful and cathartic to talk about their experiences with suicide [48, 49]. Based on the inquisitive nature of the follow-up calls, participants may believe they are solely answering study questions instead of partaking in an effective intervention. Finally, when considering when the majority of patients decided to discontinue, this occurred at the first point of follow-up post-discharge, suggesting that the problem may lie in the logistics of connecting with participants post-discharge. Furthermore, the support of an ongoing clinician (i.e., community based or hospital based clinicians) can encourage better intervention retention [50].

There were not many resources required for implementing the intervention, and in particular, it is beneficial in terms of personnel as it does not require intensive training in order to be administered. However, as the intervention does not require intensive training, it is constrained by the data collection instruments involved which are very structured. This may lead participants to believe follow-up calls are simply meant for data collection processes instead of an effective and helpful intervention, reiterating our earlier point about the follow-up calls needing to be more person-centered to allow for more fulsome engagement. Future directions should include the incorporation of a more resource-oriented questionnaire that involves open-ended questions to prompt participants to share more about their mood and life post-discharge. Studies investigating retention and engagement characteristics of people with a history of suicidal behavior have stated that baseline questionnaires are often accompanied by a lack of concentration from the participant, so open-ended questions should be utilized to encourage participation. Consequently, it may be important to provide additional training to research personnel in conducting open-ended research interviews and follow ups. As the BIC intervention has an otherwise minimal resource load, it would be feasible to increase training for research personnel and provide participants with access to technology or community voicemail systems to increase retention.

Limitations

There are several limitations of the current feasibility study. To begin, this study recruited participants with either a history of suicide attempts or a history of suicidal ideation. Thus, the findings are not specific to either of these populations, but rather, the recruitment rates are reflective of a population generally considered at risk of suicide based on current or past suicidal behavior. Another limitation of this study is that the recruitment occurred at a single site. To ensure that the findings are generalizable for a greater number of individuals, it may be important to conduct a multi-site trial as one of the future directions. Furthermore, participants provided brief descriptions for declining or withdrawing from the study. Future studies should aim to collect this information with more exploratory questions if possible, to ensure the most accurate reasons for withdrawal has been identified. It is also important to mention that there was notable early loss to follow-up that occurred in this study, which limits information collected on reasons for withdrawal or declining to participate. Additionally, only patients who were deemed eligible by clinical staff were approached by research staff, which may have introduced sampling bias, however this was done to ensure confidentiality and consent to be approached by research staff were maintained and clinical judgment to avoid unnecessary demands or stress on patients. Clinical staff considered the acute mental health status and capacity to engage in the study as criteria for eligibility. Lastly, a limitation of this study is the absence of predefined progression criteria to measure the success of feasibility outcomes. However, given that this is an exploratory study that prioritized process-driven outcomes to learn about and adapt a new intervention with limited established benchmarks of success, defining specific progression criteria a priori would have been challenging.

Conclusion

We believe this feasibility study is one of very few to comment on factors affecting recruitment and retention in research involving inpatients with suicidal behavior. It was difficult to determine whether recruitment and retention were similar to other research

involving this population as other studies often didn't report these data and varied in terms of the acuity of their participants. Recruitment and retention were not associated with age or sex in this study. The most common barriers to recruitment involved a lack of interest, feeling too unwell to participate, and wanting to be approached another time. Common barriers to retention involved no specific reason provided to discontinue, a lack of interest in continuing, and not wanting to be contacted anymore. While these reasons are brief, they are relatively consistent among other research in mental health. We hope that the findings from this study will help in the design of future research involving patients with suicidal behavior to reduce barriers to participant recruitment.

Moving forward, larger, mixed-methods studies may be beneficial in elucidating more detailed barriers and facilitators to participation in suicide research. More specifically, a larger trial will allow for both quantitative and qualitative data collection looking at the effectiveness of strategies addressing the reasons presented for loss to follow-up by allowing the research team to ask both open and close-ended questions about reasons for not participating and/or discontinuing participation. Additionally, it may be helpful to expand larger trials to multiple sites, to observe factors affecting recruitment and retention in various inpatient and outpatient locations. Certain challenges encountered in the design of this study, such as overly time-intensive baseline and end of study questionnaires and more resource-based follow-up calls that dissuaded study participation can also be modified in larger trials. Furthermore, more intentional post-discharge contact efforts need to be made to increase study retention, as most participants lost to follow-up in this study could not be contacted in the first week post-discharge. Overall, very few strategies addressing recruitment and retention have been explored in psychiatric research, and especially in the context of suicide. As suicide is a highly sensitive and stigmatized issue, it is particularly important to identify and implement effective strategies. To improve the external validity of suicide research, it may be beneficial to compare demographic and clinical characteristics between research participants and non-participants in suicide research as done with other areas of clinical research.

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Authors' contributions
ZS conceived of the study question. ZS, DS, BP, AD, CLB, SS, LT, HS, SC, and NS contributed to intervention components design and selection of assessment tools. DS wrote the study protocol, and the background, methods, conclusion, and contributed to the discussion section of the manuscript. BP conducted data analysis, wrote the results and limitations, and contributed to the discussion section of the manuscript. AD conducted participant recruitment and follow-up while also contributing to the development and execution of the BIC program. DS, BP, AD, LG, JL, DW, and SC conducted participant recruitment. All authors read and approved the final manuscript.

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Data availability
The datasets generated and analyzed during the study are not publicly available to help protect the privacy of the participants. However, they may be available from the corresponding author on reasonable request and with ethics board approval.

Declarations

Ethics approval and consent to participate
This study was approved by the Hamilton Integrated Research Ethics Board (#3786).

Consent for publication
Not applicable.

Competing interests
The authors declare that they have no competing interests.

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