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Effect of mobile phone-based psychotherapy in suicide prevention: a randomized controlled trial in Sri Lanka

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Summary

We conducted a randomized controlled trial to test whether a Brief Mobile Treatment (BMT) intervention could improve outcomes relative to usual care among suicide attempters. The intervention included training in problem solving therapy, meditation, a brief intervention to increase social support as well as advice on alcohol and other drugs, and mobile phone follow-up. The effect of the intervention was measured in terms of a reduction in suicidal ideation, depression and self-harm at Baseline, six and 12 months. A wait-list control group received usual care. A total of 68 participants was recruited from a Sri Lankan hospital following a suicide attempt. Participants who received the intervention were found to achieve significant improvements in reducing suicidal ideation and depression than those receiving usual care. The BMT group also experienced a significant improvement of social support when compared to the control group. However, the BMT group did not demonstrate a significant effect in reducing actual self-harm and most substance use, and differential effects on alcohol use were restricted to men. Although the present study was limited in revealing which component of the intervention was more effective in preventing suicide, it showed its efficacy in reducing suicide as a whole.

Introduction

Suicide is a considerable, but largely preventable, problem all over the world. Approximately one million people will die from suicide every year, and 10–20 times more people will attempt suicide. In Sri Lanka, suicide death rates are almost twice as high as the world average.[1] Although deaths from suicide in Sri Lanka have been reduced by proper medical care and other remedies,[2,3] suicide attempt rates remain high and preventive programmes are limited due to the lack of health-care workers for follow up care. Suicide re-attempts are common and often fatal.[4] Telehealth has been used to provide follow-up care[5] and evidence is emerging about its value in psychological interventions.[6] However, evidence about the use of mobile phones in suicide prevention has yet to be published.[7]

The objective of the present study was to test whether a Brief Mobile Treatment (BMT) intervention can improve outcomes relative to usual care among suicide attempters.

Accepted 8 January 2012

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Methods

The intervention included training in problem-solving therapy, meditation, a brief intervention to increase social support as well as advice on alcohol and other drugs, and mobile phone follow-up (Table 1). A randomized controlled trial was undertaken to evaluate the effect of this intervention in terms of reduction of suicidal ideation, depression and self-harm. The study was approved by the appropriate ethics committees in Australia and Sri Lanka.

The study was a randomized, single-blind clinical trial with a wait-list control group. A total of 68 participants were recruited. The design is summarized in Figure 1. Participants were recruited from patients undergoing treatment following a suicide attempt in Colombo South Teaching Hospital, Sri Lanka. The selection criteria were:

Inclusion

(1) Admitted to the hospital after attempting self-harm;
(2) Aged 15–74 years (parental/guardian consent was obtained for those who were 15–18 years of age);
(3) Displayed significant suicidal intent at the interview or on the Beck Scale for Suicide Ideation (BSSI);

 DOI: 10.1258/jtt.2012.SFT107

Table 1 The Brief Mobile Treatment intervention

Phase I. Face-to-face component
(a) assessment of mental health (1–2 h)
(b) meditation (1 h total) including awareness of
1. breathing
2. feelings/activities/actions
3. thoughts

(c) problem solving (30–60 min)
(d) brief interventions to increase social support (30–60 min)
(e) brief interventions to reduce alcohol and other drug use (30–60 min)
(f) training to use mobile phones (10–20 min)

Phase II. Distance (mobile/web) follow-up
(a) Ten telephone calls of 10–15 min duration at day 2 and 4, and at 1, 2, 4, 6, 10, 12, 18 and 24 weeks post discharge. The purpose of the calls is to:
1. assess suicidality and mood (on a 0–10 scale)
2. guide through a brief problem-solving/planning intervention
3. provide guidance in regard to improving social support
4. guide through reduction of alcohol/other drug use

(b) Continuous access to 5 min audio phone messages
1. 1 of 3 meditation messages
2. 1 of 3 problem-solving messages

(c) Weekly SMS reminders up to 26 weeks
1. provide meditation and problem-solving messages
2. remind about relevant spiritual/philosophical ideas
3. remind about social support
4. remind about avoiding alcohol/other drugs
5. encourage to use SMS/help-line to get individual support if in crisis

(4) Likely to be discharged within two days or able to be re-approached if admitted for longer than two days;
(5) Able to give informed consent to participate.

Exclusion

(1) Ongoing psychiatric treatment;
(2) Current psychosis or history of treated psychosis;
(3) ICD 10 diagnosis of dementia.

Participants were recruited only when their physical status had been stabilized. After obtaining informed consent, baseline assessments were conducted using following tools:

(1) Demographic survey;
(2) Beck Scale for Suicidal Ideation;
(3) Beck Depression Inventory;
(4) MOS social support survey;
(5) Alcohol Use Disorders Identification Test;
(6) Drug Check Problem List.

The participants were randomly allocated to Immediate or Delayed Brief Mobile Treatment (I-BMT or D-BMT). The participants in the I-BMT group received BMT immediately, while those in the D-BMT group received the intervention at six months post-hospitalization. At six months, an independent assessor repeated the baseline measures with the participants. The assessor was blind to the treatment. Thereafter, the participants in D-BMT group were able to begin BMT. The BMT was administered in addition to usual care throughout the study. At the end of 12 months, another independent assessor assessed the outcomes of the participants using same tools. At the end of 12 months, another independent assessor who was blinded to the treatment, assessed the outcomes of the participants using the same tools.

Results

There were no significant differences between the groups at baseline (Table 2). Intention-to-treat analyses showed that

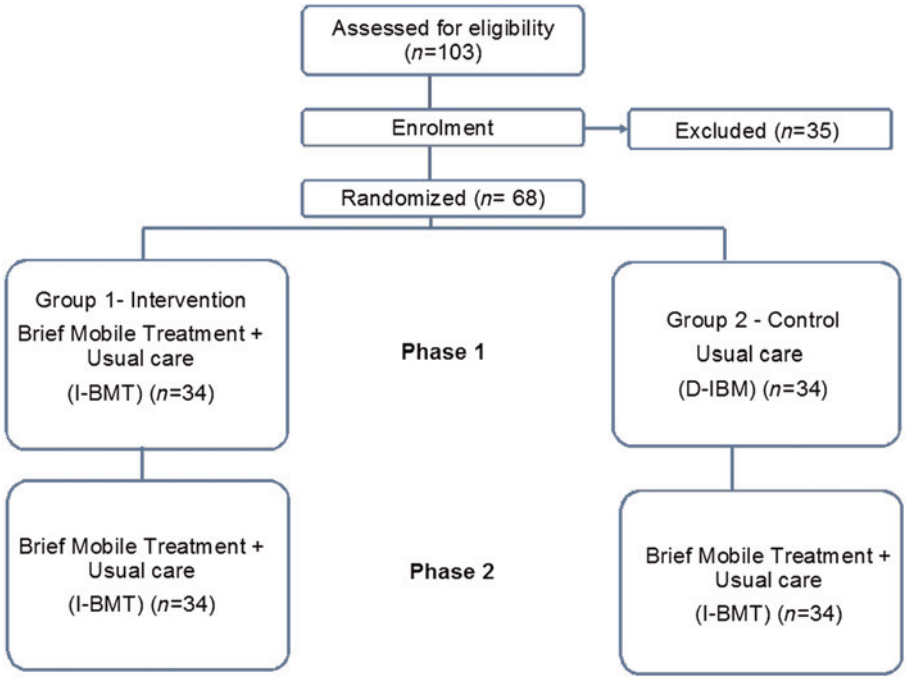

Figure 1 Study design

Table 2 Baseline characteristics of the participants

		Control No (%)	Intervention No (%)
2a. Categorical variables			
Gender	Male	17 (50)	17 (50)
	Female	17 (50)	17 (50)
Ethnicity	Sinhalese	29 (48)	31 (51)
	Tamils	4 (67)	2 (33)
	Muslims	1 (50)	1 (50)
Religion	Buddhism	27 (47)	30 (53)
	Christian	1 (50)	1 (50)
	Catholic	0	2 (100)
	Hinduism	3 (60)	2 (40)
	Islam	1 (50)	2 (50)
Employment	Not employed	16 (50)	16 (50)
	Self-employed	5 (50)	5 (50)
	Part time	5 (42)	7 (58)
	Full time	6 (60)	4 (40)
	Retired	2 (67)	1 (33)
	Not mentioned		
Marital status	Never married	18 (47)	20 (53)
	Married	14 (52)	13 (48)
	Divorced /separated	1 (100)	0
	Widowed	1 (50)	1 (50)
Education	Up to Year 12	11 (52)	10 (48)
	Up to Year 10	18 (49)	19 (51)
	Up to Year 9	2 (67)	1 (33)
	Up to Year 8	1 (50)	1 (50)
	Up to Year 7	0	1 (100)
	Up to Year 5	2 (67)	1 (33)
	Up to Year 3	0	1 (100)
Environmental issues	Life events	1 (25)	3 (75)
	Bereavement	1 (100)	0
	Isolation	4 (44)	5 (56)
	Breakdown of a close relationship	5 (42)	7 (58)
	Interpersonal conflict	8 (53)	7 (47)
	Others	15 (56)	12 (44)
		Control Mean (SD)	**Intervention Mean (SD)**
2b. Continuous variables			
Age (years)	Male	29 (14)	30 (14)
	Female	31 (16)	34 (17)
Number of dependants	Male	1.1 (1.5)	1.8 (1.9)
	Female	1.1 (1.4)	1.2 (1.4)
Education (years)	Male	11 (1)	10 (2)
	Female	10 (2)	10 (2)
Monthly Income (SLR)	Male	4706 (5289)	6941 (8035)
	Female	9882 (9082)	5709 (5394)

Table 3 Key outcomes at baseline, at six and at 12 months

		Baseline		Six months		12 months	
	Gender	Control Mean (SD)	Intervention Mean (SD)	Control Mean (SD)	Intervention Mean (SD)	Control Mean (SD)	Intervention Mean (SD)
BSSI[1]	Male	21.3 (15.6)	26.7 (11.7)	6.2 (5.5)	3.5 (1.8)	3.9 (2.2)	3.2 (1.1)
	Female	22.2 (13.8)	25.5 (12.9)	8.9 (6.2)	3.8 (1.4)	3.6 (1.3)	4.0 (3.5)
BDI[2]	Male	42.7 (11.9)	46.2 (7.3)	13.3 (6.1)	5.9 (2.4)	5.4 (3.2)	2.4 (2.3)
	Female	43.0 (8.7)	44.5 (8.7)	11.6 (6.5)	8.1 (6.3)	4.3 (3.8)	3.5 (4.6)
MOS[3]	Male	53.1 (10.9)	50.5 (10.1)	63.1 (9.7)	65.1 (12.4)	73.0 (8.2)	72.4 (11.1)
	Female	52.4 (9.8)	48.0 (10.6)	62.2 (9)	71.2 (7.8)	72.0 (6.4)	75.4 (6.5)
AUDIT[4]	Male	6.1 (4.3)	7.7 (4.5)	2.8 (2.5)	2.5 (2.8)	2.1 (3.1)	2.6 (3.4)
	Female	0.2 (1.0)	0.12 (0.5)	0	0	0.3 (1.2)	0
DCPL[5]	Male	6 (4.2)	6.7 (4.3)	6.1 (4.3)	6.5 (4.2)	2.1 (2.9)	3 (3.1)
	Female	0.1 (0.2)	0	0.1 (0.2)	0	0	0
SDS[6]	Male	1.6 (2.2)	2.3 (2)	1.6 (2.2)	2.1 (1.9)	1.1 (1.3)	1.2 (1.6)
	Female	0	0	0	0	0	0

[1]BSSI: Beck Scale for Suicidal Ideation
[2]BDI: Beck Depression Inventory
[3]MOS: Medical Outcomes Study
[4]AUDIT: Alcohol Use Disorders Identification Test
[5]DCPL: Drug Check Problem List
[6]SDS: Severity of Dependence Scale

average scores for both conditions improved on all outcome measures. The estimated means are shown in Table 3.

Clinical responses on suicidality (BSSI), Depression (BDI-II), social support (MOS) and substance use (AUDIT, DCPL with SDS) were generally improved. The Time effect was significant in all outcome measures (Figure 2a to 2f).

With regard to suicidality (BSSI), Depression (BDI-II) and social support (MOS), Condition × Time was significant, but Gender × Time and Condition × Gender × Time (three-way interaction) were not significant. However, with regard to substance use, there was a significant Gender × Time effect noted in all measures (i.e. AUDIT, DCPL and SDS scores). Furthermore, the results did not show a significant

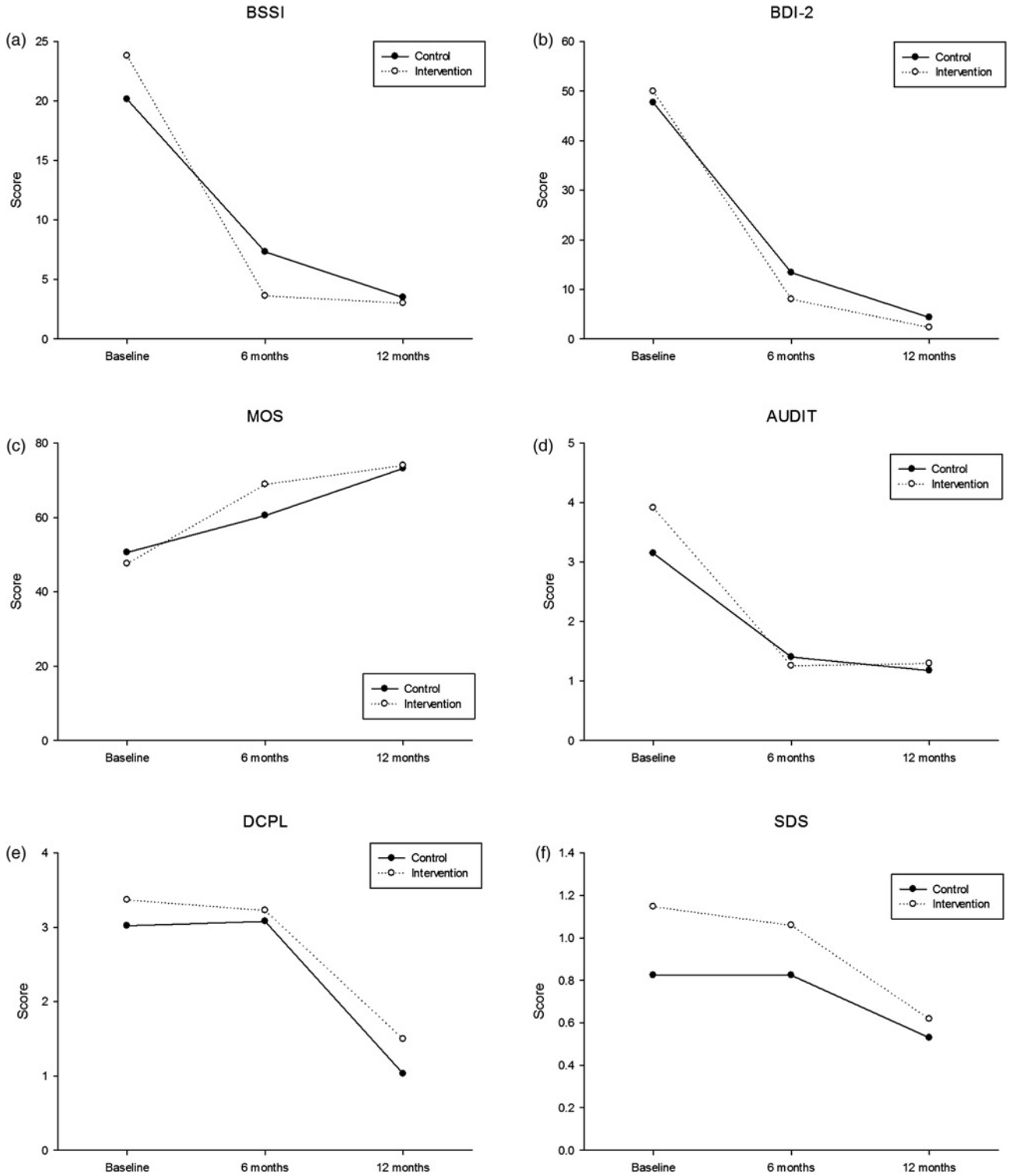

Figure 2 Mean outcome scores at baseline and at six and 12 months post discharge. (a) BSSI, (b) BDI-II, (c) MOS, (d)AUDIT, (e) DCPL and (f) SDS scales

effect on either Condition × Time or Condition × Gender × Time on substance use (e.g. AUDIT, DCPL or SDS) measures.

A differential effect was noted when the time was broken down into two non-orthogonal contrasts (Baseline vs. 6 months and Baseline vs. 12 months). With regard to suicidality (BSSI), Depression (BDI-II) and social support (MOS), the Condition × Time was significant for Baseline vs. six months but not significant for Baseline vs. 12 months. With regard to the AUDIT score, the Time and Gender × Time effect was significant for both Baseline vs. six months and Baseline vs. 12 months measures. With regard to DCPL and SDS scores, a significant Time and Gender × Time effect observed only for Baseline vs. 12 months.

Discussion

The present study investigated the therapeutic effect of a telemedicine intervention in suicide prevention in Sri Lanka. Participants who received the Brief Mobile Treatment were found to achieve significant improvements in reducing suicidal ideation and depression than those receiving usual care. The BMT group also experienced a significant improvement of social support when compared to the control group. However, the BMT group did not demonstrate a significant effect in reducing actual self-harm and most substance use, and differential effects on alcohol use were restricted to men.

The benefits of immediate intervention were obtained, despite the fact that control participants also received a mobile phone (which might have been expected to have some therapeutic effects, for example by providing additional opportunities for receiving social support and emergency assistance). The results from the control group suggest that receiving a mobile phone may have had some effect on outcomes, since they shared some improvements over the first six-month period. However, that might have been regression to the mean (i.e. some recovery after an unusual increase in suicidality) or an expectancy effect, rather than a substantive benefit of the mobile phone. In a future study, it would be interesting to see whether a comparable group who did not receive a mobile phone or call credits had a similar decline.

Only one previous suicide prevention trial appears to have been conducted in Sri Lanka. A pilot study found significantly reduced BSSI scores after their intervention (face-to-face CBT), but that study had a total of only 10 participants (6 intervention and 4 control).[8] No international study has been found to compare with the present study, although certain components of such studies have shown similar results. Although the present study was limited in revealing which component of the intervention is more effective in preventing suicide, it showed its efficacy in reducing suicide as a whole.

Acknowledgements: We are grateful for funding from the Improving Relevance and Quality of Undergraduate Education (IRQUE) project of the University of Sri Jayewardenepura, Sri Lanka.

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