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Title	Group problem-solving skills training for self-harm: randomised controlled trial
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Publication date	2014-05-01
Original Citation	McAuliffe, C., McLeavey, B. C., Fitzgerald, T., Corcoran, P., Carroll, B., Ryan, L., O'Keeffe, B., Fitzgerald, E., Hickey, P., O'Regan, M., Mulqueen, J. and Arensman, E. (2014) 'Group problem-solving skills training for self-harm: randomised controlled trial', British Journal of Psychiatry, 204(5), pp. 383-390. http://dx.doi.org/10.1192/bjp.bp.111.101816
Type of publication	Article (peer-reviewed)
Link to publisher's version	10.1192/bjp.bp.111.101816
Rights	© 2014, Royal College of Psychiatrists. This is an author-produced electronic version of an article accepted for publication in the British Journal of Psychiatry. The definitive publisher-authenticated version is available online at http://bjp.rcpsych.org.
Download date	2026-10-31 11:39:36
Item downloaded from	https://hdl.handle.net/10468/2914

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Group problem-solving skills training for deliberate self-harm: A randomised controlled trial

Authors

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Abstract

Background: Rates of deliberate self-harm (DSH) are high and have recently increased. This trend and the repetitive nature of DSH pose a significant challenge to mental health services.

Aims: To determine the efficacy of a structured group problem-solving skills training (PST) programme as an intervention approach for deliberate self-harm (DSH) in addition to treatment as usual (TAU) as offered by mental health services for adults who had recently engaged in deliberate self-harm.

Method: A total of 433 participants (aged 18-64) were randomly assigned to treatment as usual plus PST, or treatment as usual alone. Assessments were carried out at baseline and again at 6 weeks and 6 months follow-up.

Results: Participants assigned to the PST intervention as well as those assigned to TAU showed significant improvements in psychological and social functioning, indicating that both groups benefited significantly from their treatment. On one measure (needing and receiving practical help from those closest to them), those in the PST intervention scored significantly higher. Repetition rates at follow-up were similar in both treatment groups.

Conclusions: For DSH patients for whom the majority have a previous history of DSH, a brief problem-solving skills training programme is no more effective than treatment as usual.

Declaration of interest

None. Funding detailed in Acknowledgements.

Introduction

Rates of deliberate self-harm have shown a steady increase in recent years, particularly in men.[1] Deliberate self-harm (DSH) is the most important risk factor for suicide[2-4] and the risk of suicide is further increased among those who self-harm repeatedly, particularly among females.[5] Rates of repeated self harm are significant and increasing[6]. Yet there has been a lack of research evidence of effective treatment interventions for DSH.[7,8] which limits the power of treatment guidelines.[9,10]

Poorer problem-solving ability has been found among people engaging in DSH,[11-15] particularly those who self-harm repeatedly.[16-18] There is substantial evidence that problem-solving ability mediates the relationship between stress and DSH, whereby individuals with poor problem-solving ability under chronic stress are more likely to become hopeless and/or suicidal.[19-22] Evidence also suggests that good problem solving protects against DSH, independently of depression or hopelessness levels.[16] Among people who deliberately self-harm, coping responses characterised by greater passivity and avoidance are associated with an increased risk of repeated DSH.[18]

Promising results have been found for problem-solving therapy in reducing repetition of DSH.[7-8,23] In an early study of Interpersonal Problem Solving Skills Training (IPSST) 39 self-poisoning patients were randomly assigned to 5 sessions of individual IPSST, or to a brief problem-oriented approach. While similar improvements were found in levels of hopelessness and presenting problems for both treatment conditions, those assigned to IPSST had a lower rate of repetition at 12 months follow-up compared with the control group[24] The difference in repetition between treatment groups was not statistically significant however as, like many of the early trials, the sample size was too small. A later trial involving 120 adults who had recently self-harmed reported a significantly lower repetition rate among those assigned to a cognitive therapy arm comprising 10 outpatient cognitive therapy sessions that included a problem-solving component, compared with usual care.[25] The investigators also reported a significant improvement in self-reported levels of depression and hopelessness, but there was no difference between treatment conditions on rates of suicidal ideation. Generalisation of the study outcomes is difficult due to the high self-harm repetition rate in the control group. Another trial[26] examined a 12-session cognitive-behavioural therapy (CBT) programme with 90 adolescents and young adults (aged 15-35 years) who had recently engaged in self-harm.

The programme was based on a model of maintenance factors of DSH drawing on the assumption that they can be modified by adjusting negative thinking and problem-solving deficits. The authors reported a significant reduction in repetition of DSH in the CBT group. Even though the study outcomes support the efficacy of brief CBT for self-harm, it is not clear if the outcomes can be generalised due to the relatively young target population and the pattern of frequent self-harm repetition prior to enrolment in the study.

The failure of an earlier trial using a manual assisted cognitive therapeutic approach to demonstrate a reduction in repeat episodes[27] in which over one-third of the active treatment sample received a treatment manual alone without any treatment sessions, suggests that reliance purely on a self-help approach among repeaters of deliberate self-harm is ineffective in reducing repetition.[28]Again, generalisation of the study outcomes was hampered by only including self-harm patients with a history of previous self-harm acts.

In the present study, the effectiveness of a brief group problem-solving skills training programme (PST) for DSH was examined among both young and adult self-harm patients and including those with and without a history of previous self-harm. When the PST programme was previously compared against standard care in the treatment of self-poisoners using individual psychotherapy, lower rates of repeated self-harm were reported in the PST group[24.]

The intervention was based on a problem-solving model of self-harm and its repetition, originally developed for the treatment of depression.[29] Compared with TAU alone, the PST programme was expected to be significantly more effective in:

1. Reducing the rate of repetition of deliberate self-harm and suicidal ideation;
2. Improving psychological and social functioning as assessed by standardised measures of interpersonal problem-solving skills, self-efficacy and perceived social support;
3. Reducing levels of depression, anxiety, hopelessness and impulsivity.

Method

Design

Following initial assessment, participants were randomly assigned to treatment conditions on the basis of a computer-generated sequence of numbers. Allocation was concealed using sealed opaque envelopes. Randomisation was stratified according to the gender and repeater status of participants as well as the study site at which participants were recruited. Participants were randomly assigned to either six sessions of group Problem-Solving Skills Training (PST) in addition to TAU (standard care) as offered by the Mental Health Services or to TAU only.

Participants

The trial was approved by the Clinical Research Ethics Committee of the Cork University Teaching Hospitals and the HSE Mid-Western Area Regional Ethics Committee. Consecutive patients aged 18 to 64 were included in the trial if, during the previous 3 days, they had engaged in self-harm defined according to the definition devised by the WHO Working Group of the WHO/EURO Multicentre Study on Suicidal Behavior[30] as *"an act with non-fatal outcome, in which an individual deliberately initiates a non-habitual behavior that, without intervention from others, will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognized therapeutic dosage, and which is aimed at realizing changes which the subject desired via the actual or expected physical consequences".* All participants received a psychiatric review by a liaison psychiatrist in line with standard practice in all recruiting emergency departments and acute psychiatric units. On the basis of the psychiatric review notes, patients were excluded from the trial if they had a history of psychosis, learning disability, sensory disability or organic cognitive impairment; were currently alcohol or drug dependent; were in prison at the time of the episode or were not living at a fixed abode. The baseline assessment schedule included the Short Alcohol Dependent Data questionnaire (SADD)[31], a 15-item measure of present state dependence among adults. Only those with a diagnosis of alcohol or drug dependence or who scored above the cut off for dependence on the Short Alcohol Dependent Data questionnaire (SADD) were excluded.

Recruitment was conducted at the Emergency Departments of Cork University Hospital, Mercy University Hospital and South Infirmary-Victoria University Hospital in Cork, and the Mid-Western Regional Hospital in Limerick, and the acute psychiatric units at Cork

University Hospital and Mercy University Hospital in Cork, and the Mid-Western Regional Hospital in Limerick, respectively between November 2001 and March 2005. The trail was stopped when the target number was reached. Patients self-harming on acute psychiatric units with or without presentation to the emergency department were included in the trial. After trail commencement the eligibility criteria were broadened to include patients self-harming on acute psychiatric units at the recruiting hospitals in order to increase recruitment.

Insert Figure 1 about here

Procedure

At each of the recruitment centres, informed written consent was obtained by trained research officers from eligible patients who had engaged in self-harm within the previous 3 days prior to initial assessment and randomisation. Participants were then assessed either at the recruitment site or at home using a structured assessment schedule. The first section, which assessed characteristics of the index episode and symptoms, was administered within three days of the index episode. Where possible, the remainder of the schedule was administered at the same time but where circumstances did not allow for this, arrangements were made to complete the assessment within two weeks of the index episode. Psychological, behavioural and social characteristics of participants were assessed at baseline, 6 weeks (i.e. post-treatment), and 6 months follow-up, using the instruments outlined in Table 1.

Insert Table 1 about here

As part of the consent sought, all participants were encouraged to identify a significant other (e.g. friend or family member) who would support their initial connection with the programme. Following randomisation, significant others were informed by letter that they had been nominated to support their involvement in the treatment programme (PST or TAU) and were encouraged to do so in practical ways e.g. transport to treatment sessions or through moral support and encouragement. Following recruitment all participants (PST and TAU) were contacted by telephone on a weekly basis to minimise pre-treatment attrition.

Six weeks assessment

At the end of treatment, participants in both conditions completed a post-assessment schedule, which was broadly similar to the baseline assessment (Table 1).

Six months follow-up

Six months after the treatment had ended, participants in both conditions completed a shortened version of the post-assessment schedule (Table 1).

Outcome measures

The primary outcome measure was the proportion of participants in each treatment condition who repeated self-harm during the follow-up period, i.e. at six weeks and six months follow-up (both hospital treated and non-hospital treated). Researchers checking hospital re-presentation were blind to participant treatment allocation. Although there was no centralised mechanism for identifying cases of suicide, those that were detected via hospital records were included in the follow-up repetition data. Secondary outcome measures included suicidal ideation, depression, hopelessness, anxiety, impulsivity, self-efficacy, problem solving (process and outcome measures) and social life. These were assessed using the scales listed in Table 1.

Intervention

Problem-Solving Skills Training

The Problem-Solving Skills Training programme (PST)[32] consisted of six two-hour closed group sessions, held weekly, of structured manualised interpersonal problem-solving skills training, facilitated by a trained therapist and a co-therapist. A 'Practice at Home Journal' was provided for participants to carry out homework assignments using their own interpersonal problems.[33] Treatment fidelity was ensured by strict adherence to the skills training manual, completion of a session adherence self-report worksheet by therapists at the end of each weekly session and weekly supervision by a research psychologist who had delivered the training to the therapists. Supervision included screening of session adherence self-report worksheets. The programme was held in a central community-based venue in both trial sites. To minimise attrition rates, problem-solving therapists made routine between-session phone calls to participants in the PST treatment group to remind them of the date and time of their next appointment.

Treatment as usual

Treatment as usual (TAU) involved assessment by mental health professional staff and by crisis nurses. Psychosocial assessment of all patients was carried out by a psychiatrist (liaison psychiatry or mental health team) to determine mental health needs and level of risk to self or others. Patients who had no contact with mental health services during the previous year and not requiring referral on to mental health acute or community based services were referred to the crisis nurse service for further psychosocial assessment and suicide risk assessment. A collaborative management plan of care including a problem-solving approach and relapse prevention techniques was agreed between the Crisis Nurse and the patient. Those who were referred on by the psychiatrist to mental health acute or community based services were commonly offered pharmacological treatment and review by the mental health team and less frequently counselling or psychotherapy.

Power analysis

Based on the power calculation, 219 participants were required in each treatment condition of the trial in order for the study to have 80% power to identify a reduction from 20% to 10% in the proportion who repeated self-harm as being statistically significant at the 5% significance level.

Statistical analysis

For each treatment condition, paired-sample t tests were used to assess differences in continuous measures between two time periods. For the primary outcome measure (repeated DSH during follow-up), separate binary regression models were estimated for each follow-up period. These models were estimated using the data from all participants assessed at 6 weeks (n = 354) and 6 months (n = 326) follow-up. The covariates included were the treatment condition and whether the participant had a history of DSH prior to the index act. For each of the other outcome measures, treatment effect (PST versus TAU) was estimated using a linear mixed effects model 34. The model included a random intercept to allow for correlations between repeated measures on the same individual. The covariates included were the baseline value, treatment condition, follow-up period and the interaction of treatment condition and follow-up period. The interaction term allows the effect of treatment to differ between 6 weeks and 6 months follow-up. Change over time and treatment effect were not assessed for the problem-solving skills measures, Means-Ends Problem-Solving procedure (MEPS) and

the Optional Thinking test (OT), as these analyses would have been based on data from only 55% of the 433 participants. For each of the other outcome measures, analysis was based on data from 66-85% of the 433 participants. Data were analysed using Stata version 12.1.

Results

During the recruitment phase, 2,661 patients presenting with DSH were screened for the trial (*Figure 1*). The data tells us that 120 (27.7%) were screened and recruited from acute mental health in-patient units. The vast majority of these participants would have presented to the emergency department.

Over half of the patients screened (1,527) were ineligible. Of those screened, 16% (*n*=426) were alcohol dependent, 13% (*n*=356) were outside the age range, 8% (*n*=216) had a current or previous psychosis, 7% (*n*=181) were living outside the trial area, 3% (*n*=79) were drug dependent, 2% (*n*=64) were not medically fit within the required time to complete the initial assessment, 2% (*n*=62) were not living at a fixed abode, and 1% (*n*=35) had a learning disability. A further 6 individuals had a sensory disability. Of those screened, a total of 1,134 patients (43%) were eligible for inclusion in the trial**.** Of those eligible, a total of 433 patients (38%) were randomised, while 701 (62%) refused to participate. A total of 222 patients were randomised to group problem-solving skills training, while a further 211 were randomised to treatment as usual.

Demographic characteristics, previous DSH and method of index DSH episode of participants in both treatment groups are reported in Table 2. Participants assigned to TAU (*n*=211) were similar to those in PST (*n*=222) with regard to gender, age, marital status, employment status and previous DSH. A higher proportion of those assigned to TAU had self-harmed using overdose at index episode.

Insert Table 2 about here

Outcome measures at Baseline, Post-assessment and Follow-up

Insert Table 3 about here

Similar proportions of repeaters (hospital treated and non-hospital treated episodes) were identified in each treatment condition at all three follow-up periods (Table 3). The median length of time from index episode to starting a group was 40 days. At 6 weeks post-

assessment 12.4% of participants assigned to PST reported one or more repeat DSH episodes compared with 14.6% of those in TAU (p=0.53). At 6 months follow-up 17.8% of those assigned to PST reported one or more repeat DSH episodes compared with 15.3% of those in TAU (p=0.56). A similar number of repeat episodes was reported by participants in both treatment conditions at 6 weeks (p=0.50) and at 6 months follow-up (p=0.83). The mean number of repeat episodes was 1.8 (SD=2.0) for participants assigned to PST and 2.1 (SD=2.6) for those assigned to TAU (p=0.48). Among the 55 assigned to PST who repeated during follow-up, 38 repeated once, 10 repeated twice, 2 repeated 3 times, 3 repeated 4 times, 1 repeated 8 times and 1 repeated 13 times. Among the 50 participants assigned to TAU who repeated, 30 repeated once, 10 repeated twice, 3 repeated 3 times, 3 repeated 4 times, 3 repeated 5 times and 1 repeated 18 times. Although there was no centralised mechanism for identification of suicides, three participants were known, based on hospital records, to have died by suicide during the follow-up period (2 in TAU and 1 in PST).

Compared to those in the TAU condition, participants in the PST condition did not show a significantly greater change on any of the outcome measures at 6 weeks or at 6 months follow-up, with the exception of the Practical Support subscale from the Social Life Scale on which those assigned to TAU showed significant improvement at 6 weeks (p=0.03). The Practical Support subscale is a measure of the extent to which a person needs practical help and receives practical help from the person closest to them.

Drop-out rates

There was a significant difference in rate of drop-out from the trial (in terms of those failing to present at follow-up) between the two treatment conditions. Drop-out rates were higher in the TAU group 23% vs. 14% in the PS group (p=0.009) at 6 weeks assessment and 30% in the TAU group vs. 20% in the PST group (p=0.02) at 6 months follow-up. There was no difference in baseline measurement between those who attended the 6 week assessment and those who didn't with the exception of scores on the BAI (mean=23.5 vs. 26.8 respectively, p=0.04). There was no difference in baseline measurements between those who attended the 6 month follow-up and those who didn't.

Compliance with group interpersonal problem-solving skills training

A relatively high rate of treatment compliance was found among those assigned to PST. Almost half of those assigned to PST (103/47.2%) attended all 6 therapy sessions. Just under three-quarters of those assigned to PST (153/70.18%) attended 3 or more treatment sessions. Most of the attrition occurred prior to the clients' first session, with 43 clients (19.7%) failing to attend any sessions. When compliance is examined among those who attended at least one treatment session, 103/58.85% of clients attended all 6 sessions, while 153/87.42% attended 3 or more PST sessions. Unfortunately due to the wide range of treatments received by those assigned to TAU and the wide range of settings in which these treatments were delivered it was not possible to ascertain compliance with treatment for this group.

Discussion

Main findings

The brief group problem-solving skills training programme described above was designed to enhance standard care following an episode of medically treated deliberate self-harm. The main trial hypothesis, that PST in addition to standard care would be significantly more effective in reducing repetition of self-harm and suicidal ideation than TAU alone, was not supported. Compared with TAU alone, those who received PST in addition to standard care did not show significantly greater improvement in psychological and social functioning or significantly greater reductions in depression, anxiety, hopelessness or impulsivity. In fact, no significant differences were found between DSH participants in the PST and TAU condition on any of the outcome measures examined, with the exception of the practical support subscale of the Social Life scale on which participants in the TAU condition showed a significantly greater improvement at 6 weeks. At both 6 weeks and 6 months follow-up, symptoms of depression and anxiety were lower among DSH participants in the PST condition compared to TAU, but did not reach statistical significance.

DSH participants in both the PST and TAU treatment conditions showed significant improvements on most outcome measures. In both conditions, DSH participants improved significantly on 9 out of 11 outcome measures comparing baseline to 6 weeks follow-up. At 6 months follow-up no further significant changes were observed for these outcome measures, indicating that improvements made in both treatment conditions were maintained over time.

Possible explanations for lack of differential treatment effects

The theoretical model underlying the experimental treatment (PST) condition was that the development of improved interpersonal problem-solving skills in participants would lead to reduced vulnerability to repeated DSH. While significant improvements were found in these skills among participants in both treatment conditions, no significant differences were found between those in PST and those in TAU on any of the outcome measures of problem solving at 6 weeks or 6 months follow-up. Several procedural aspects of the trial may have had a therapeutic effect on the patient's condition and therefore may have contributed to the lack of differential treatment outcomes between PST and TAU. As described earlier, participants in both PST and TAU were encouraged to identify a significant other (e.g. friend or family member) who would support their initial connection with the treatment programme.

Following randomisation, significant others (PST and TAU) were informed by letter that their relative or friend had nominated them as their significant other to support their involvement in the treatment programme. Following recruitment, all participants (PST and TAU) were contacted by telephone on a weekly basis to minimise pre-treatment attrition. The participants themselves were also notified by telephone and by letter of their treatment allocation. Initial and follow-up assessments provided participants in both treatment conditions with the opportunity to discuss problems. In cases where participants were discharged from hospital prior to completion of initial assessment and where they could not make their way to the venue for follow-up assessment, home visits were arranged by the researcher. This too may have obfuscated differences between the treatment conditions. The possible therapeutic effects of these active intervention aspects should not be underestimated. For example, in an earlier trial by Carter and colleagues[35] the number of repeat self-harm episodes was significantly reduced in those who received a minimal intervention (8 postcards posted to medically treated self-poisoners over a 12 month follow up period). Like Carter and colleagues however, the design of the present trial does not allow us to examine the possible mechanism of action of these additional interventions.

Limitations

While significant improvements in outcome measures at follow-up were found among patients in both treatment conditions and a number of explanations can be offered for the lack of differences in outcomes between PST and TAU, additional limitations of the trial merit attention.

Differential drop-out rates

The significantly greater drop out at post-assessment and follow-up of participants assigned to TAU may have masked important differences in treatment outcome at both follow-up periods. Those who failed to attend the 6 week follow-up had significantly higher levels of anxiety at baseline assessment suggesting that they may have been more unwell at follow-up.

Duration and format of PST

A brief group-based Interpersonal Problem-Solving Skills Training intervention delivered over 6 sessions may not have been sufficient to significantly reduce repetition among the group of DSH patients included in the present trial, of whom the majority had a history of previous DSH episodes and scored within the severe range on level of depression. The brief

interventions tested in recent trials with DSH patients (published after our trial commenced) typically include 10-12 treatment sessions[25,26]. Furthermore, the PST intervention of six weeks duration may have been too brief to teach patients skills to interrupt repetition, when considered in the context of the high risk of repetition for the first 12 months following the index episode. This is further supported by negative outcomes of a brief manual-assisted CBT intervention (max. 7 sessions) for self-harm patients all of whom had a history of previous self-harm acts[27]. In contrast, an earlier trial using a brief 12-session CBT intervention lasting approximately 5.5 months, showed positive treatment effects on self-harm repetition and related mental health outcomes favouring the CBT intervention.[26] Another possible explanation for the lack of differential treatment effects is the group format of the PST programme. A recent review of cognitive-behavioural interventions to reduce suicidal behaviour found that trials where one-to-one CBT was included and trials combining individual and group treatment showed a very significant effect on repetition, whereas studies using group therapy alone did not.[23] The clinical profile of participants in the present trial indicates a group that requires more intensive input (incorporating one-to-one and group therapy sessions and long-term treatment approaches), to address patterns of frequent DSH repetition associated with co-morbid psychological and psychiatric problems.[25,26] Many of the patients who completed the PST intervention indicated the need for more than 6 treatment sessions, which further supports this explanation.

Eligibility

The most common reason for ineligibility for the trial was alcohol dependence followed by age that was outside the trial age range. Together these comprised half of those excluded from the trial. Given the high risk of repetition among those abusing alcohol[36] and the high rates of DSH among girls aged 15-19 years in particular[1] this trial failed to evaluate the efficacy of problem-solving skills training in reducing repetition in these sub-groups.

Clinical implications

Taken together, our findings indicate that for self-harm patients for whom the majority have a previous history of DSH, a brief problem-solving skills training programme is no more effective than treatment as usual. This means that it is not cost effective to offer six sessions of group problem-solving therapy to patients who present with deliberate self harm. This has

important health economic implications. It adds to the evidence base for low cost minimal interventions for deliberate self-harm.

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Acknowledgements

This work was supported by funding from the Health Service Executive (HSE) South, HSE Mid-West, the National Office for Suicide Prevention, the Health Research Board and Pobal-Dormant Accounts Fund in Ireland.

The authors wish to thank the therapists, hospital staff, and voluntary research assistants for facilitating this research, and Professor Keith Hawton of the Oxford University Centre for Suicide Research, for his valuable support.

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Figure 1. Flow of participants through the trial.

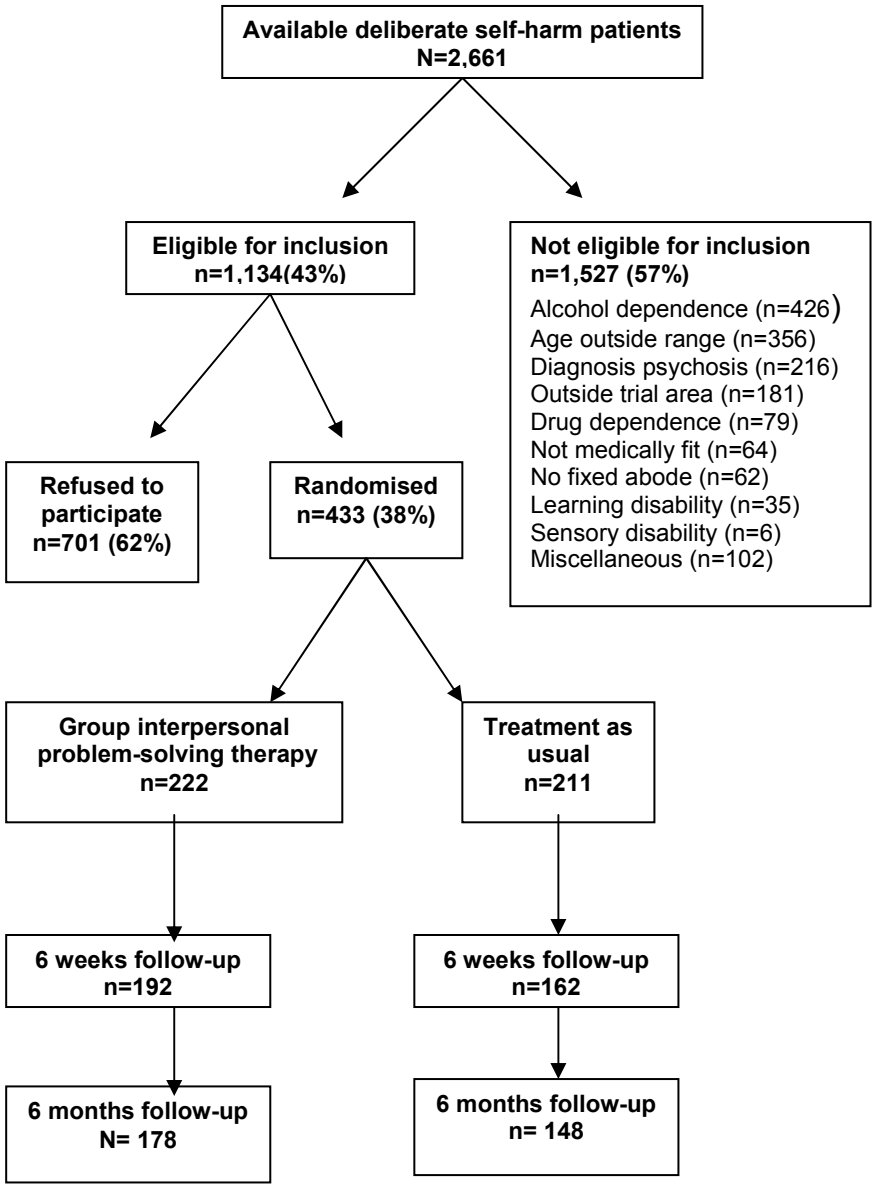


Table 1. Overview of instruments used to assess psychological, behavioural and social characteristics assessed at baseline, 6 weeks post-assessment and 6 months follow-up

Assessment scales	Abbreviation	Baseline	6 Weeks	6 months
Suicide Intent Scale (Beck et al, 1974)*	SIS	✓	-	-
Beck Scale for Suicidal Ideation (Beck et al., 1988)*	BSS	✓	✓	✓
Beck Depression Inventory (Beck et al., 1961)*	BDI	✓	✓	✓
Beck Anxiety Inventory (Beck et al., 1988)*	BAI	✓	✓	✓
Barratt Impulsivity Scale (Patton et al., 1995)	BIS	✓	✓	✓
Generalised Self-efficacy Scale (Jerusalem & Schwarzer, 1992)	GSS	✓	✓	✓
Means-Ends Problem-Solving Procedure (Platt et al., 1975)	MEPS	✓	✓	-
Optional Thinking Test (Platt & Spivak., 1977)	OT	✓	✓	-
Self-Rating Problem-Solving Scale (McLeavey & Daly, 1988)	SRPS	✓	✓	✓
Current Problems List (McLeavey, 1988)		✓	✓	✓
Beck Hopelessness Scale (Beck et al., 1974)*	BHS	✓	✓	✓
Social Life Scale (Stansfeld & Marmot, 1992; Surtees et al., 2000)		✓	✓	✓

* Denotes instruments which were administered at baseline within 3 days of the index episode

Table 2. Baseline characteristics of participants receiving group problem-solving therapy (*n*=222) and treatment as usual (*n*=211)

Characteristic		PST	TAU
Gender	Female	64%	65%
Age	Mean (Std. dev.)	33.4 (11.5)	33.6 (12.1)
Marital status	Single/cohabiting	59%	59%
	Married	28%	25%
	Widowed	13%	14%
	Divorced	0.5%	1.5%
Employment	Employed (full/part)	52%	57%
	Unemployed	17%	20%
	Disabled	8%	8%
	Student	11%	5%
	Home duties	12%	9%
	Retired	2%	1%
Education	Primary	13%	16%
	Junior Certificate	24%	30%
	Leaving Certificate	35%	34%
	Third level	28%	20%
Previous DSH	Yes	64%	63%
Index method	Self-poisoning	76%	85%
	Self-cutting	20%	17%
	Hanging	6%	4%
	Drowning	6%	4%
	Other	2%	2%
Suicidal ideation	Mean (SD)	12.8 (11.2)	12.4 (11.4)
Depression	Mean (SD)	35.8 (13.4)	36.3 (13.6)
Hopelessness	Mean (SD)	10.9 (5.7)	10.6 (6.1)
Anxiety	Mean (SD)	23.5 (12.9)	24.7 (13.3)
Impulsivity	Mean (SD)	73.2 (13.7)	76.1 (12.0)
Self-efficacy	Mean (SD)	22.7 (6.3)	23.0 (7.1)
Self-rated problem solving	Mean (SD)	70.6 (11.8)	70.4 (12.2)
Means-ends problem-solving (MEPS)	Median (Q1, Q3)	.40 (0, .86)	.25 (0,.80)
Optional thinking (OT)	Median (Q1, Q3)	.67(.33,.75)	.67(.33,.80)
Social life ***Confiding/Emotional***	Mean (SD)	8.2 (2.4)	8.4 (2.6)
Social life ***Practical support***	Mean (SD)	4.8 (2.0)	5.1 (2.0)
Social life ***Negative***	Mean (SD)	12.2 (3.0)	12.6 (3.3)

Table 3. Change in outcome measures and treatment effect at 6 week and 6 month follow-up

	PST M (95% CI)	**TAU** M (95% CI)	**Treatment effect PST vs TAU** M (95% CI)	**p-value**
Repeated DSH during follow-up				
Change at 6 weeks (n=354)	12.4%	14.6%	0.85 (0.50, 1.43)*	0.53
Change at 6 months (n=326)	17.8%	15.3%	1.16 (0.71, 1.88)*	0.56
Suicidal ideation (n=263) -BSS				
Change at 6 weeks	-7.8 (-9.8, -5.8)	-6.0 (-8.3, -3.8)	-1.7 (-3.9, 0.4)	0.11
Change at 6 months	-8.4 (-10.5, -6.3)	-7.1 (-9.5, -4.6)	-0.7 (-2.8, 1.5)	0.55
Depression (n=362) - BDI				
Change at 6 weeks	-17.5 (-19.8,-15.1)	-14.5 (-17.0, -12.0)	-2.8 (-6.0, 0.3)	0.08
Change at 6 months	-18.1 (-20.7, -15.6)	-16.3 (-19.2, -13.5)	-2.2 (-5.4, 1.0)	0.19
Hopelessness (n=366) -BHS				
Change at 6 weeks	-4.0 (-5.0, -2.9)	-3.2 (-4.3, -2.1)	-0.9 (-2.2, 0.3)	0.15
Change at 6 months	-4.1 (-5.2, -3.0)	-3.1 (-4.1, -1.9)	-0.6 (-1.9, 0.7)	0.37
Anxiety (n=343) - BAI				
Change at 6 weeks	-9.2 (-11.1, -7.3)	-8.2 (-10.6, -5.8)	-1.9 (-4.5, 0.7)	0.16
Change at 6 months	-9.3 (-11.4, -7.2)	-8.3 (-11.0, -5.7)	-1.8 (-4.4, 0.9)	0.20
Impulsivity (n=321) - BIS				
Change at 6 weeks	-0.9 (-2.8, 0.9) p=.33	-2.5 (-4.5, -0.5) p=.01	1.6 (-1.1, 4.3)	0.25
Change at 6 months	-1.3 (-3.4, 0.9) p=.24	-2.6 (-4.8, -0.4) p=.02	1.3 (-1.8 , 4.4)	0.42
Self-efficacy (n=350) GSS				
Change at 6 weeks	2.9 (1.7, 4.0)	2.2 (1.1, 3.3)	1.0 (-0.4, 2.4)	0.18
Change at 6 months	3.7 (2.5, 4.8)	2.7 (1.4, 3.9)	1.0 (-0.5, 2.4)	0.20
Self-rated problem solving (n=329) - SRPS				
Change at 6 weeks	7.6 (5.3, 9.8)	5.9 (3.4, 8.3)	2.3 (-0.8, 5.3)	0.15
Change at 6 months	8.3 (5.8, 10.7)	7.1 (4.5, 9.6)	2.1 (-1.0, 5.2)	0.18
Social life: *Confiding/Emotional* (n=289)				
Change at 6 weeks	-0.8 (-1.3, -0.3)	-0.4 (-1.0, 0.1) p=.15	-0.5 (-1.0, 0.1)	0.11
Change at 6 months	-0.8 (-1.3, -0.3) p=.003	-0.5 (-1.1, 0.1) p=.13	-0.3 (-0.9, 0.3)	0.30
Social life: *Practical support* (n=287)				
Change at 6 weeks	0.1 (-0.3, 0.6) p=.59	-0.8 (-1.3, -0.4)	0.5 (0.07, 1.0)	0.03
Change at 6 months	-0.1 (-0.6, 0.3)	-0.8 (-1.3, -0.4)	0.5 (0.0, 1.0)	0.06
Social life: *Negative* (n=288)				
Change at 6 weeks	0.9 (0.3, 1.5) p=.004	0.1 (-0.5, 0.7) p=.71	0.4 (-0.2, 1.0)	0.23
Change at 6 months	1.4 (0.8, 2.0)	1.1 (0.4, 1.7)	0.3 (-0.4, 0.9)	0.77

* Risk ratio (95% CI)

Note: All changes at follow-up were highly statistically significant ($p<0.001$) except where indicated. A negative change at follow-up represents an improvement for all measures with the exception of the Self-efficacy, Self-rated problem-solving and the *Negative* subscale of the Social Life scale.