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A feasibility study highlighting challenges in evaluating a structured, psychological treatment for self-harm in adult psychiatric inpatient settings

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ABSTRACT

Background: Despite being the most common reason for admission to psychiatric inpatient services, no evidence-based treatment currently exists for self-harm in this setting. Dialectical Behavioural Therapy (DBT) trials have found promising results in treating self-harm in outpatient settings; however findings for inpatient settings are still limited.

Method: A single-arm feasibility trial was conducted examining a DBT-informed 'Coping with Crisis' (CwC) group protocol, which focused on self-harm and crisis management strategies. Twenty-four participants were recruited from an inpatient ward in a National Health Service (NHS) Trust in the UK. The Inventory of Statements about Self-Injury and Distress Tolerance Scale were administered at baseline and post-therapy. Data was collected on the rates of recruitment, retention, session attendance, outcome measure completion, adverse events and participant feedback, in order to inform the design of a main study.

Results: Findings indicated that it was feasible to run the CWC group and research study on an inpatient ward. However, there were several challenges in recruiting to target (80% achieved) and retaining participants (38% of consented participants completed). A number of implementation issues were identified and recommendations have been made to inform future group and study designs.

Introduction

The National Institute of Health and Clinical Excellence (NICE, 2011) in the UK defines self-harm as "self-poisoning or self-injury, irrespective of the apparent purpose of the act", differing to that used by the American Psychiatric Association (APA, 2013), which defines self-harm as "deliberate, self-inflicted harm that *isn't intended to be suicidal*", highlighting an area of contention in the literature.

Self-harm behaviour has been associated with long-term difficulties (relationship break-downs, housing or financial problems; Hawton et al., 2003), mental health conditions (Haw et al., 2001; Meltzer et al., 2002) and a higher risk of completed suicide (Hawton et al., 2012). More recently, the literature presents an alternative view of self-harm as a 'positive experience' (Edmondson et al., 2016) and a strategy that helps people cope with difficult life experiences (James et al., 2017; Shaw and Shaw, 2012). Previous research also shows inconsistencies in defining self-harm have had a significant impact on the collection of self-harm data and the quality of research in this field (Muehlenkamp et al., 2015; Ougrin et al., 2009; Turner et al., 2014; Washburn et al., 2012). This study was based on the definition in the NICE guidelines (2013); suicidal intent is not simply present or absent but is more complex and changeable. This paper also accepts that this complexity extends to the person's relationship to the act of self-harm, which in many cases is not entirely negative one as it is often widely assumed (Hume and Platt, 2007).

The National Suicide Prevention Strategy for England (Her Majesty's Government Department of Health, 2012) suggests people who self-harm are at high-risk and subsequently in serious need of attention. National standards for inpatient care and recent research stipulate that therapeutic activities are crucial in treating people in psychiatric inpatient facilities (NICE, 2011; Beavon et al., 2017; Bowers et al., 2015). However, over the last five decades, the psychiatric inpatient services in the UK have been 'deinstitutionalised', initiating a shift in treatment from hospital to community settings. Whilst, overall this process has been viewed as a positive one (Lakeman et al., 2007), it has also meant there has been a shift in focus and funding while demand for beds has not reduced (Gilburt, 2015). This has resulted in many wards being reported as "not safe, therapeutic or conducive to recovery" by patients and carers (Commission on Acute Adult Psychiatric Care, 2015). While this shift has largely been driven by cost savings, it has been found that

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short admissions (< 28 days) increase the risk of readmission (Leff and Trieman, 2000; Manuel et al., 2015; Taft Parsons, 2006) and requires additional investment in community resources (Naylor and Bell, 2010). This shift has left inpatient services with little research, development or direction (Bowers, 2005). In addition, research is practically very challenging to carry out in ward environments that are typically busy and chaotic (James et al., 2017; Roach et al., 2009). This may go some way to explain why no evidence-based treatment currently exists to treat self-harm behaviour in adults in an inpatient environment (Turner et al., 2014; Winter et al., 2007).

Boyce et al. (2003) reported "no single treatment has confirmed superiority" for treating self-harm with a psychological intervention in any setting, but concluded, "DBT appears to confer most benefit". Dialectical Behavioural Therapy (DBT) trials have found promising results in treating self-harm in outpatient settings (Linehan, 1993). More recently, there have been favourable results from a DBT-informed group in an inpatient setting (Booth et al., 2014; Gibson et al., 2014). Booth et al. (2014) ran 24 DBT-informed groups over six weeks, recruiting 114 participants in an inpatient setting. The researchers found significantly decreased self-harm after the participants attended the group ($P = 0.01$), concluding that a brief DBT-based group conducted on an inpatient ward could be effective in reducing self-harm. Gibson et al. (2014) extended this study using the same method and also found self-harm was significantly reduced ($P = 0.01$) post group intervention. Gibson et al. (2014) reported a 73% retention rate, which is similar to previous inpatient research (Jacobsen et al., 2018; Wood et al., 2018). However, both these group programmes (Booth et al., 2014; Gibson et al., 2014) ran for longer than the average length of stay on inpatient wards and therefore not practically applicable.

It was decided that the current study would aim to evaluate feasibility and acceptability of a novel transdiagnostic DBT-informed skills group (Linehan 1993a,b) for adults who self-harm in a psychiatric inpatient setting. Firstly, an aim was set to obtain more than 70% retention rate. Due to the flexible nature of the intervention, with patients being able to attend as many or few groups as they wished, participant engagement was defined by attendance to at least one therapy group, similar to previous inpatient research (Paterson, 2018). Secondly, an aim was set to run groups to fit four standalone group sessions conducted within a two-week period *within the average length of stay* (31 days; NHS Benchmarking, 2018). The treatment protocol differs from previous studies in that it is a shorter transdiagnostic group programme, aimed at female *and* male inpatients who self-harm. The group aimed to provide the participants with coping strategies derived from Linehan's (2014) DBT Skills Training Handouts and Worksheets manual, with the aim of equipping them to manage times of crisis.

The aims for this feasibility study were:

1) To determine the number of eligible participants who are screened, recruited and accept the current treatment within this setting.
2) To determine the extent of participant engagement to the psychological groups (aim was set to obtain more than 70% retention rate, defined by engaging in at least one therapy group).
3) To obtain means and a standard deviation for the outcome measures in order to estimate sample size for large-scale trials.
4) To determine suitability of a compact group skills programme.

2. Method

2.1. Design

A single-arm feasibility trial was conducted to examine the feasibility and acceptability of the DBT-informed Coping with Crisis (CWC) intervention. This study followed guidance outlined by the Consolidated Standards for Reporting Trials (CONSORT) for feasibility trials (Eldridge et al., 2016). As the aim of this study was to examine feasibility and acceptability, a randomised controlled trial (RCT) was not required and thus a single-arm trial was conducted to maximise the number of participants accessing the intervention (Eldridge et al., 2016). Health Research Authority and NHS Research Ethics Service (NRES) approval was granted prior to the commencement of this study. The study process is outlined in Fig. 1.

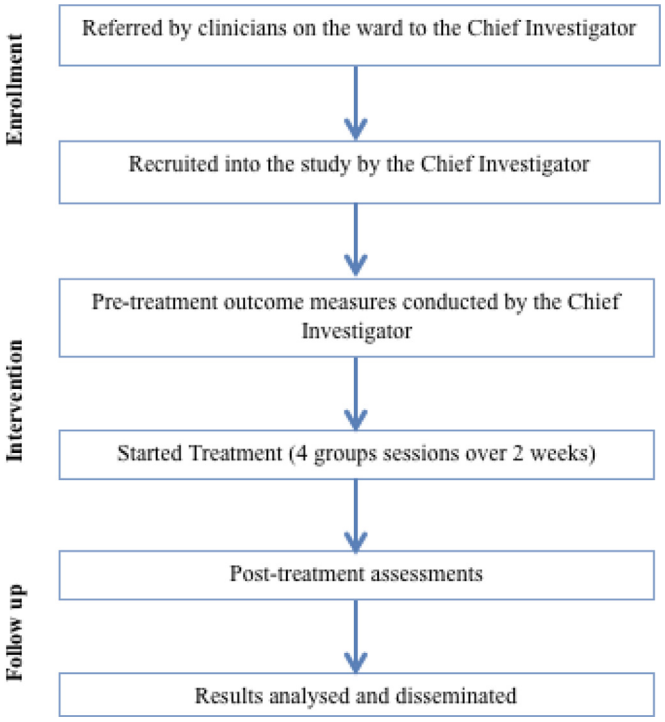

Fig. 1. Flow diagram of study procedure.

2.2. Participants

The setting for the research was a mental health inpatient unit, in an outer London hospital. Patients were recruited from five inpatient wards, and were either informal or formally detained under the Mental Health Act (Bluglass and Beedie, 1983).

Participants were included if they; (i) were aged between 18–65 years, (ii) admitted to a mental health inpatient hospital, (iii) had a history of or at least one episode of self-harm, and (iv) had capacity to consent (determined by their ability to understand the information sheet). They were excluded if; (i) they were non-English speakers (due to translation costs), (ii) they lacked the capacity to give informed consent, which was assessed on an on-going basis by the researcher (the participants were given the opportunity not to attend the groups or complete the forms at all times) and (iii) if their symptoms prevented them from concentrating for an hour at a time (i.e. severe thought disorder).

2.3. Sample size

This feasibility study aimed to recruit 30 participants. Sample sizes of 24–50 have been determined as suitable to meet the requirements of a feasibility study (Browne, 1995; Julious, 2005; Lancaster et al., 2004; Sim and Lewis, 2012).

2.4. Measures

Two standardised self-report measures were used at baseline and post-therapy. 'The Inventory of Statements About Self-Injury' (ISAS; Klonsky and Glenn, 2009) is a 46 item self-report measure, with two additional optional items, designed to assess the function and frequency

of self-harm previously reported in the literature (Klonsky, 2007). 'The Distress Tolerance Scale' (DTS; Simons and Gaher, 2005) was used to assess distress tolerance called the 'Distress Tolerance Scale' (DTS; Simon and Gaher, 2005). The DTS consists of 15 items, which measures participants' appraisal of their emotional distress, their ability to tolerate this distress and any regulation efforts to alleviate it.

In terms of feasibility measures, participant demographics were taken to examine the age, education, ethnicity, gender, employment status, diagnoses, medication, previous treatment, previous hospital admissions and mean length of stay in hospital. A feasibility measure was developed to collect key other feasibility outcomes including rates of recruitment, participant engagement, session attendance, outcome measure completion, adverse events and participant feedback on the study and treatment. A qualitative feedback questionnaire, based on one developed by Wood et al. (2017), provided participants with the opportunity to give their views on both the acceptability and usefulness of the therapy groups and research process including suitability of outcome measures was also used. These questionnaires asked what they found helpful and unhelpful.

2.5. Intervention

The intervention was developed following complex intervention guidelines outlined by the Medical Research Council (Craig et al., 2008). Four novel transdiagnostic, one-hour, standalone group sessions based on DBT skills were developed. Initially, systematic review of relevant literature was examined to identify relevant group protocols, which would inform the research (Booth et al., 2014; Gibson et al., 2014; Linehan et al., 2006). Permission to copy handouts and worksheets from 'DBT Skills Training Handouts and Worksheets' by Linehan (2014) was given for the purpose of this study. The first draft of the group protocol was developed by the author in consultation with a clinical psychologist / DBT practitioner (fully trained and certified in DBT) who advised on the skills and group content. Clinical psychologists at the hospital where the study was planned to take place, who have experience with the client group under study, were sent a draft for review. Following feedback, the protocol was adapted in order to enable assistants to facilitate.

The skills included in the one-hour group protocol included mindfulness focusing on (i) operating from 'wise mind', (ii) observing skills, (iii) describing skills, (iv) participating skills, all underlined with the skill of being non-judgmental and not self-critical. Reflection on the mindfulness was a part of these sections, which aids the teaching of mindfulness (this took 15 min of the group). For the remaining 45 min of the groups 'Distress Tolerance' (DT) and 'Emotional Regulation' (ER) skills were included using the following skills; labelling emotions, STOP skill, (acting opposite), coping strategies (pros and cons, building mastery, taking care of the body), self-soothing (five senses), crisis survival strategies (contingency plan). The final iteration of the intervention was developed so it could be delivered by assistant psychologists, as well as qualified psychologists.

3. Results

3.1. Aim 1; to determine the number of participants screened and recruited to the study

In order to determine the number of eligible participants who are screened, recruited and accepted the treatment, a pre-determined recruitment window was set at six months, which is in line with relevant research (Wood et al., 2017). In this time, the study was able to recruit a total of 24 participants. Demographics for these participants are outlined in Table 1. This was 80% of the target sample size (30 participants).

Participant flow is outlined in Fig. 2. Of the 63 people who were referred by clinicians as eligible for the self-harm intervention over the recruitment period, 43 people (68%) agreed to meet with a researcher and 20 people (32%) did not. The reasons for not obtaining consent to meet with a researcher from these 20 people can be split into two; those who actively declined to meet with the researcher (two people, 10%) and those who were not available to be asked because they were either on leave, discharged or asleep (18 people, 90%).

Of the people who agreed to meet with the researcher (n = 43), 24 people (56%) agreed to consent and complete the outcome measures. Of the 19 people (44%) who did not consent to take part when at the researcher meeting, nine people (47%) expressed that they were not interested in taking part in the group and 10 people (53%) were not able to take part. From these 10 people who were not able to take part, six people (60%) no longer met the inclusion criteria (one person lacked capacity, three people presented with thought disorder, two people did not want to talk about their self-harm), four people (40%) were being discharged the same day or following day.

Table 1
Sample characteristics at baseline (characteristic / gender).

	Gender		
	Male	Female	Total
Characteristic	(n = 17)	(n = 7)	(n = 24)
Mean age in years (SD):	38.8 (5.7)	37.4 (14.3)	36.3 (8.8)
Age range in years:	21–55	25–48	21–55
Ethnicity: n (%)			
White British	14 (82%)	3 (43%)	17 (71%)
'Mixed' ethnicity	0	2 (29%)	2 (9%)
Black British	0	1 (14%)	1 (4%)
Pakistani	1 (6%)	0	1 (4%)
White European	1 (6%)	0	1 (4%)
Jamaican	1 (6%)	0	1 (4%)
Polish	0	1 (14%)	1 (4%)
Primary	0	1 (14%)	1 (4%)
Secondary School	4 (25%)	4 (57%)	17 (71%)
O-Levels / GCSEs	11 (65%)	2 (29%)	13 (54%)
A-Levels	2 (12%)	0	2 (9%)
Single	13 (76%)	4 (57%)	17 (71%)
Married	2 (9%)	2 (29%)	4 (17%)
Engaged	1 (6%)	0	1 (4%)
Divorced	0	1 (14%)	1 (4%)
Separated	1 (6%)	0	1 (4%)
Unable to work	2 (29%)	4 (57%)	9 (38%)
Out of work	4 (25%)	2 (28%)	6 (25%)
Employed	7 (41%)	1 (14%)	8 (33%)
Self-employed	1 (6%)	0	1 (4%)
Diagnosis: n (%)			
BPD	3 (18%)	3 (44%)	6 (25%)
Psychosis	3 (18%)	2 (28%)	5 (21%)
Not known	2 (11%)	2 (28%)	4 (17%)
Depression	5 (29%)	0	5 (21%)
No diagnosis	2 (12%)	0	2 (8%)
Anxiety	1 (6%)	0	1 (4%)
ASC	1 (6%)	0	1 (4%)
Medication:			
Yes	13 (76%)	5 (71%)	18 (75%)
Mean stays in current hospital stay (SD):	20 (SD, 36)	66 (SD, 41)	31 (SD, 42)
Previous admission:			
Yes	11 (65%)	6 (86%)	17 (71%)
More than 5 previous admissions	4 (24%)	5 (71%)	9 (38%)
Mean length of previous stay	30 (SD, 19)	66 (SD, 41)	44 (SD, 33)
Previous talking therapies			
Yes	7 (41%)	6 (86%)	13 (54%)

Notes. BPD = Borderline Personality Disorder, ASC = Autism Spectrum Disorder.

3.2. Aim 2; to determine participant engagement with the psychological groups

In order to determine participant engagement to the groups, attendance records were kept. Out of the 24 people who were consented to start the groups, 71% of participants attended at least one group, in

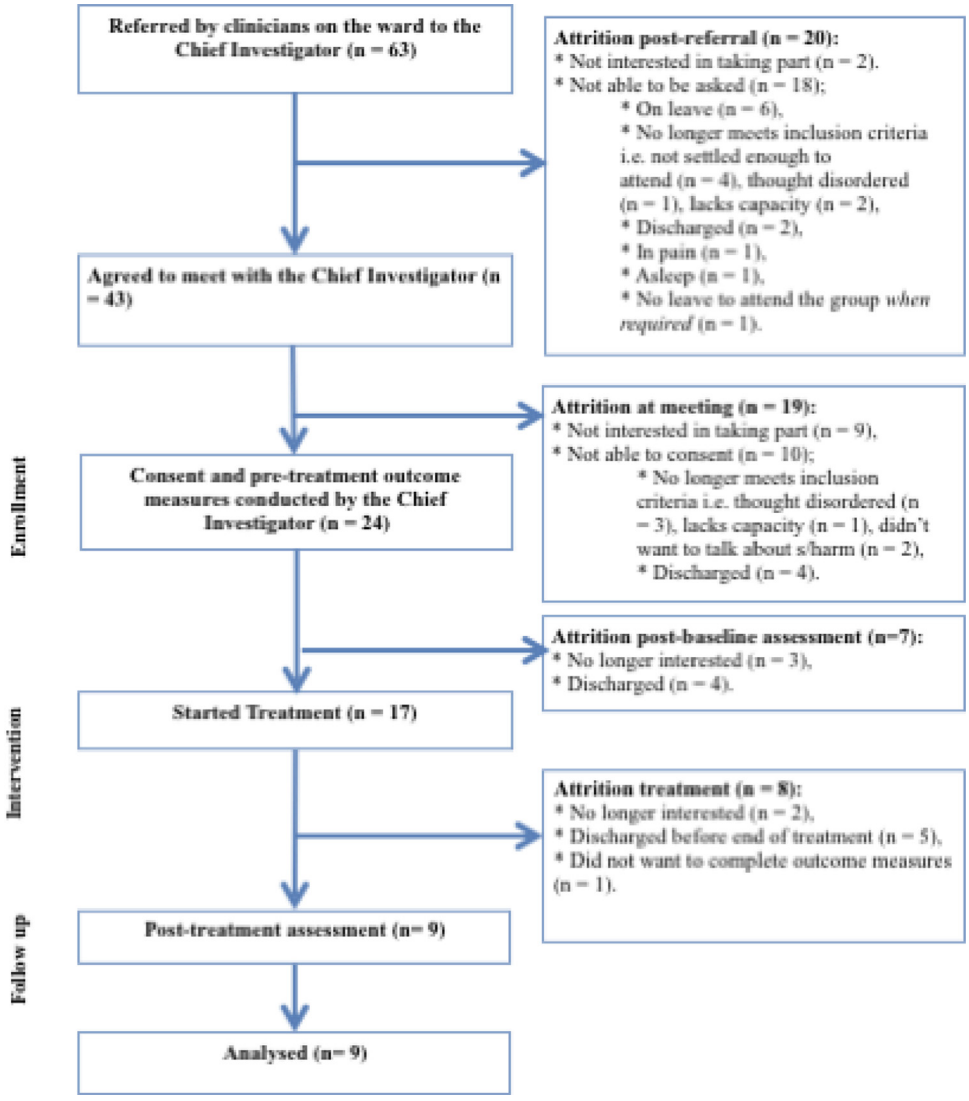

Fig. 2. Flow diagram of participants progressing through the study.

line with previous retention rates to programmes of this kind (Gibson et al., 2014) and indicating feasibility of participant recruitment and engagement. Two people (8%) attended all four groups, three participants (13%) attended three groups, seven participants (29%) attended two groups, five participants (21%) attended one group only and seven participants (29%) did not attend any groups after consenting to take part.

Overall, being discharged from the ward accounted for the most common reason people did not attend the groups (45%). Being tired or unmotivated to take part accounted for the next highest reason people excused themselves from groups (27%), followed by people having other commitments, such as meetings or being on leave from the ward (23%) and lastly the deterioration of mental state prevented one person from attending groups (5%).

A further eight people (33%) dropped out during treatment. From the people who dropped out during treatment (n = 8), five people (63%) were discharged, two people (25%) were 'no longer interested', and one person (12%) did not want to complete the outcome measures.

3.3. Aim 3; to obtain statistics for the outcome measures

In order to obtain means and a standard deviation for the outcome measures all 24 participants were asked to complete both pre and post outcome measures. However, only nine participants (38%) completed post-intervention outcome measures, which meant 15 participants (62%) were not able to complete these. Of these 15 participants, six people (40%) decided not to complete the measures despite remaining on the ward for treatment, eight people (53%) were discharged before they were asked to complete the measures, one person (7%) was not able to due to deterioration in their mental state. Given the low post-intervention measures completion rates (38%), resulting in a high level of missing data, the analysis of the pre and post outcome measures was limited to descriptive statistics.

If the participants endorsed at least one form of self-harm on the ISAS (Klonsky and Glenn, 2009) they were asked to complete section two of the ISAS. Twenty-three participants (96%) completed this section at baseline and nine (38%) participants completed this section post-intervention. The statements measure thirteen different functions of self-harm. Table 1 summarises the descriptive data obtained from both outcome measures. This table includes the mean and standard deviations of each module in the DTS (tolerance, absorption, appraisal and regulation) and function in the ISAS (affect regulation, interpersonal boundaries, self-punishment, self-care, anti-dissociation, anti-suicide, sensation seeking, peer-bonding, interpersonal influence, toughness, marking distress, revenge and autonomy).

3.4. Aim 4; to determine acceptability of group skills programme

The suitability of the compact group was assessed using adverse events recording and feedback questionnaires. Clinicians were asked to monitor any adverse events for participants during the group intervention period. This practice is used to assess any potential (unexpected) impact or risk and to assess the feasibility of using the forms for a larger trial. No adverse events were reported.

The questions used in the feedback questionnaire were related to whether the group intervention and research process under investigation was feasible from the of view of participants attending the group. Inductive content analysis (Cole, 1988; Harwood and Garry, 2003) was chosen so that a systematic approach could be taken to analysing the open-ended questions provided in the feedback questionnaire. All nine participants who completed the post-intervention outcome measures also completed the feedback questionnaire.

The feedback questionnaire started by asking participants what they found helpful about the 'CwC' therapy groups. Three people (33% of respondents) named "mindfulness" as a helpful aspect of the group intervention, one person (11%) named 'distress tolerance cards', and two people (22%) reported the "strategies" given overall. These answers demonstrate that these participants found the *strategies* within the intervention helpful, rather than other aspects of the group process.

Next, the participants were asked what they found unhelpful about the groups. Out of the nine people who agreed to fill in the questionnaire, five people (56%) left this question blank, three people (33%) answered 'nothing' was unhelpful and one person named mindfulness as not very helpful. This demonstrates that most of the participants (88%) who contributed to the feedback could not name any part of the intervention that was unhelpful. Only one person (11%) felt that mindfulness was unhelpful.

When asked what could be improved in the intervention, three participants did not respond (33%), two said no improvement was needed (22%), two felt that the group did not feel safe at times (22%), one said they would like more individual help (11%) and one thought there should be more content about self-harm (11%). The highest number of participants did not respond with any suggestions about how the group could be improved (33%). Four people (44%) gave responses that made suggestions about possible improvements to the group compared to three people (33%) responding that no improvement was needed.

The questionnaire went on to ask how many times the participants had harmed themselves since completing the group. Most of the participants said that they had not harmed themselves since attending the group (56%). Two people did not respond to this question (22%), one person said twice (11%) and one person said 10 times (11%).

The next question asked whether the participants thought they had been able to manage difficult times differently since completing the groups. Three people did not respond (33%), three said they had managed to react differently to difficult experiences (33%), two said 'no' and one person said they had 'not yet' managed to respond differently (22%). If the respondents had said "yes" to the previous question (above), they were then asked *how* they had managed things differently since the group ended. Participant 13 wrote; "I no longer feel affected by voices", participant 42 wrote that their "feelings of suicide have gone", and participant 58 was hopeful that the "reminders" provided by the group "will help me".

4. Discussion

This project demonstrated outcomes in line with previous research (James et al., 2017; Roach et al., 2009) in that conducting the project in a ward environment was challenging. Several difficulties with recruiting participants to the study were identified during the recruitment period, so adaptions were made to the methods. The means, standard deviations and effect size were calculated for the two outcome measures, however given the paucity of data obtaining robust effect sizes for future trials was not possible. The acceptability of the research process and group were analysed; there were no adverse events recorded. The participant feedback gave the participants an opportunity to voice any concerns they had about the study, unfortunately this could only be completed by 38% of the full sample in this study.

4.1. Adaptations to recruitment method and group process

The study found that there were three initial factors affecting recruitment, including i) availability of the study team, ii) screening methods, and iii) inconsistencies with the conceptualisation of self-harm by patients and clinicians.

Firstly, availability was improved by training assistant psychologists to run groups and making groups 'stand-alone' so that participants could join at any point. Secondly, attention was paid to how the participants were screened, in particular the clinician confusion about whether suicide attempts were to be included in 'self-harm behaviours'. This study found that clinicians on this UK ward tended towards the US guidance by distinguishing between the two behaviours (self-harm and suicide attempt), consequently there were eligible participants missed, supporting previous research findings that definition discrepancies cause problems in conducting research (Muehlenkamp et al., 2015; Ougrin et al., 2009; Turner et al., 2014; Washburn et al., 2012). In addition, patients were found to deny harming themselves, despite it clearly being stated in their notes. This instigated concerns about the language around self-harm putting potential participants off taking part in the study and language was adapted accordingly.

4.2. Strengths and limitations of the study

This study had a number of strengths. First, the trial protocol was registered before recruitment began (ClinicalTrials.gov; no.: 205350). Secondly, the study closely followed CONSORT guidelines (Eldridge et al., 2016) for feasibility studies to ensure methodological rigor. Although not required for a feasibility study (CONSORT guidelines; Eldridge et al., 2016), the main limitations of this study are the lack of randomisation, a control group, and follow-up data collected. Furthermore, inpatients are in receipt of inpatient treatment to reduce their self-harm and suicidality (Bowers et al., 2005), as such their mental health crisis is likely to improve the longer they are residing there (Bland and Altman, 1994), which should be monitored. In this study, the impact of factors such as these remains largely unknown and therefore the results should be viewed with caution.

In addition, two weeks is not a suitable time frame in which to comprehensively assess the impact of a psychological group. Further research should include follow-up on self-harm rates in the community, post-discharge to monitor impact of the treatment out of a supervised environment of an inpatient ward. Data from emergency departments before and after the admission to hospital could be used to determine the impact of the treatment. Data should also be collected to assess how likely these patients are to engage in treatment following a hospital admission.

4.3. Implications of findings

The findings can increase awareness of the challenges of inpatient research and possibilities for overcoming these. The adaptations made to the design provide information for future research studies, particularly in the field of self-harm and inpatient research. Overall, the study met the original aims of furthering understanding of the challenges of research of this kind in order to design and conduct a larger trial to assess the efficacy of a self-harm intervention on an inpatient ward.

A further finding in this research was that unexpected discharge from the ward accounted for the most common reason people did not attend the groups (45%). With the national drive towards

'deinstitutionalisation' of psychiatric services and funding being focused into community settings (Lakeman et al., 2007), it could be argued that hospital stays should be short. However, one of the main reasons for admitting a patient is risk of harm to themselves or others (Bowers et al., 2005). This means patients are admitted at a time of crisis, then as soon as the crisis has 'settled', they are moved back (without substantial prior warning or possibly sufficient treatment) to where the crisis had occurred. The current evidence suggests that for someone who self-harms early experiences have often been chaotic, meaning a lower capacity for tolerating distress (Linehan, 1993a). Therefore, the impact of the drive for community-based treatments and the resulting unpredictability of where one is residing should be considered more carefully. Given that national standards for inpatient care and recent research stipulate that therapeutic activities are crucial in treating people in psychiatric inpatient facilities (NICE, 2011; Beavon et al., 2017; Bowers et al., 2015), the demand for beds has not reduced (Gilburt, 2015) and community treatment is often not cost effective (Naylor and Bell, 2010), this research would recommend that more focus is devoted to ensuring evidence-based research and treatment is present on inpatient wards in the UK.

4.4. Future research

There are a number of practical issues raised by this study that future research should address. Firstly, to increase the recruitment, research should provide education for clinicians about how to screen participants, and intervene before discharge to collect measures and feedback. In order for this to happen, the whole multi-disciplinary team need to prescribe to ensuring treatment planning and care provision is following national standards (NICE, 2011; Beavon et al., 2017) for inpatient treatment, which include delivery and research of evidence-based psychological therapies. An additional measure to assess the severity of their symptoms, including thought disorder, such as 'The Positive and Negative Syndrome Scale' (PANNS; Kay et al., 1987) could also be used to reliably determine the presence of this rather than relying on diagnosis and clinician assessment.

Secondly, to increase the reliability of the primary outcome data the repetition of self-harm should be collected through clinicians as well as self-report data for an accurate number of self-harm episodes.

Thirdly, future research should collect data from patients who have been discharged back to the community in order to better reflect the efficacy of an inpatient treatment aimed at reducing self-harm, particularly where the participants are in a supervised environment such as an inpatient ward.

Subscription

Green open access.

Data availibility statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Declaration of Competing Interest

None.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2019.112609.

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