

# Improving Bereavement Outcomes in Zimbabwe: Results of a Feasibility Cluster Trial of the 9-Cell Bereavement Tool

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## Research

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# Abstract

## Context

Despite high mortality rates from both communicable and non-communicable diseases, bereavement studies are under-researched in African countries. The 9-cell bereavement tool was designed to assist individuals to reflect on their feelings in bereavement, and identify resources in families and communities to manage bereavement. This study aimed to determine the feasibility of implementing the 9-cell bereavement tool and recruitment to experimental evaluation.

**Methods:** A feasibility cluster randomized trial with embedded qualitative interviews was conducted in two comparable neighborhoods in Chitungwiza, Zimbabwe. Community leaders identified potential community lay bereavement supporters (interventionists). Each recruited 2-3 recently bereaved community members (trial participants). Following baseline data collection, the communities were randomly allocated to intervention or wait-list control. Self-administered questionnaires were completed at T0 (month 0), T1(3 months) and T2 (6 months). Grief, mental health and social support were assessed. Focus group discussions with selected interventionists described training impact and intervention processes. Quantitative and qualitative analysis were performed.

## Results

Objectives were achieved as follows

- (i) feasibility of recruitment and retention
- (ii) feasibility of implementing the intervention
- (iii) determining contamination
- (iv) completeness of data
- (v) participants' views on intervention and mechanisms
- (vi) estimating potential effect size
- (vii) determining whether full trial warranted.

In line with the aim of the study, the processes of the randomized cluster trial were possible. We successfully conducted the randomized control trial of the 9-cell bereavement tool and successfully

recruited study participants. In addition, the 9-cell intervention allowed interventionists to share and learn from their grieving process. All of the above was conducted within the intended timeframe of 3 weeks, with an over recruitment of 112% of interventionists and 43% more trial participants. This means we were able to recruit at least 75% of the suggested sample size; and to retain at least 75% of the trial participants for the total duration of the study.

## **Conclusion**

The processes of the randomized controlled trial were possible. The 9-cell bereavement intervention was delivered and process data assessed.

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## **Key Messages Regarding Feasibility**

### **1. Uncertainties that existed regarding the feasibility**

Uncertainties were centered on the objectives and aim of the study. These included whether the study would be able to participants and retain participants for the duration of the study pegged at 10 months with 3 different data collection time-points per group. The recruitment process was staggered with several stages that included community entry, permission from local authorities, and support from community members and interventionists. With retention, the uncertainty revolved the need to retain at least 75% of the participants throughout the duration and stages of the study, whilst keeping in mind any circumstances that may hinder progress, communication with participants and any national or community challenges that may present during the study.

Given the length of the study, additional uncertainties involved the possibility of contamination between the control and the intervention group and completeness of data that may be caused by possible participant fatigue in contributing to a study over 10 months. All these would affect the ability to collect data on participants' views of the intervention toward the end of the study, which would in turn, reduce the possibility of estimating potential effect size as well as presenting contributory information to determine whether a full trial would be warranted.

## 2. Key feasibility findings

In line with the aim and objectives of the study, all the processes of the randomized cluster trial were possible. It was feasible to recruit and retain 75% of the participants; there were no reported incidences of contamination, data was collected at all collection points successfully, participants views on the intervention and its mechanisms were indicated, we were able to estimate potential effect size and to determine the need for a full trial. This was the first time this locally and contextually developed 9-cell bereavement tool was tested and successfully implemented in Zimbabwe.

## 3. The implications of the feasibility findings for the design of the main study

Though some of the participants suffered loss in a time period that seemed long ago, been taken through the 9-cell bereavement tool allowed them to address the grief and pain that they had not processed. This was also discerned when the same intervention was delivered in India. Data for this study, reinforces that participants reach out beyond their own communities because of the widespread need for more people to process grief in more spaces. The study had only required them to reach out to those within their immediate vicinities. Opportunities to support more people were attained and are ongoing with requests for wider exposure to the 9-cell bereavement tool. Further requests on diseases and disorders that cause untimely death with limited information on the diagnosis were also requested as part of the grief and bereavement process. Collectively, these and more data establish the important role a healthy grieving process can play in the lives of the bereaved; and how context-specific, culturally appropriate, and individually tailored support such as that provided by the 9-cell intervention tool, is important in light of the intersectionality of individual life experiences. Together they highlight the need to conduct a full trial of the 9-cell bereavement tool. In addition, a full trial will act as a contribution to the currently sparse literature on bereavement and bereavement interventions as an essential and core component of palliative care in sub-Saharan Africa; and will have an enormous, potential public health benefit in supporting and saving lives in many more under-resourced and under-supported countries.

## Introduction

Despite high mortality rates due to communicable diseases such as HIV, tuberculosis and malaria and non-communicable diseases such as cancer, heart disease, suicide and sudden deaths; bereavement is an under-researched field in African countries<sup>1,2</sup>. The WHO Global Palliative Care Atlas<sup>3</sup>, the Lancet Commission on Pain and Palliative Care<sup>4</sup> and Universal Health Coverage<sup>5</sup> all identify a critical gap between the need for, and provision of palliative care, including bereavement care. Bereavement interventions are rarely described within African palliative care intervention studies<sup>6-8</sup>. This is urgently needed, given projections that by 2060, 48 million people will die with serious health-related suffering, 83% of these in low and middle income countries<sup>9,10</sup>. Serious health-related suffering will increase in all regions, with the largest proportional rise in low-income countries (155% increase between 2016 and 2060). Each of these deaths with suffering will significantly impact the family and community of the decedent.

Bereavement is the process during which grief is experienced over time <sup>11</sup>. Bereaved individuals who have not been through the process of grief have an increased risk of mortality <sup>12,13</sup>, deterioration of physical health <sup>12</sup>, reduced cognitive functioning, increase in mental health challenges and associated illnesses <sup>14</sup>. These outcomes negatively impact the socio-economic status of individuals whilst generating high costs in already fragile economies of low-income countries <sup>15,16</sup>. Bereavement support is therefore an essential and core component of palliative and end-of-life care <sup>17,18</sup>.

Community-based interventions using already existing structures, for example, local health cadres embedded in the local health system, are more effective and widely accepted within low-resourced countries such as Zimbabwe, whose socio-economic structures have vastly deteriorated <sup>19</sup>. Previous studies have shown that local health cadres trained to act as an extension of the central health centers are effective in health delivery as they increase coverage and access <sup>20</sup>. Caregivers from the communities that local health services serve can offer in-depth knowledge of local cultural preferences and practices for effective delivery and uptake of healthcare services <sup>21-23</sup>.

This study investigates the “9-cell bereavement intervention” developed in Zimbabwe. The 9-cell was designed to assist individuals to reflect on their feelings in bereavement and identify resources in families and communities to manage bereavement. This process is intended to increase the lay supporter’s understanding of the experience of grief and to identify ways of increasing support to the bereaved. The 9-cell bereavement tool explores the communication that the bereaved currently receive, discussing and linking their own grief and bereavement experiences with the support they need at different stages <sup>24</sup>.

This person-centred approach is designed to provide context-based, culturally appropriate and individually-tailored support. Developed in Zimbabwe, this approach has been delivered in emergency contexts and within communities in Tanzania and India, with process data suggesting an increase in awareness of the concepts behind grief and the bereavement process, but not fully evaluated.<sup>25</sup> Evidence for culturally-appropriate person-centred care in the context of serious illness and bereavement is scarce.<sup>26</sup>, especially in sub-Saharan Africa <sup>27-29</sup>. This study aimed to determine the feasibility of implementing the 9-cell bereavement tool and recruitment to experimental evaluation.

## Methods

The full protocol for this feasibility cluster trial with nested qualitative data has been previously reported in detail.<sup>30</sup> The objectives were i) to determine the feasibility of conducting a randomized cluster trial in terms of recruitment and retention; ii) to assess the feasibility of implementing the 9-cell bereavement tool; iii) to determine whether there would be contamination between the clusters; iv) to assess the acceptability and completeness of measures and data; v) to identify trial participants’ views and experience of the intervention and its mechanisms of action; vi) to estimate potential effect size; and vii) to determine whether a full trial is warranted. We summarise the methods below. They were conducted as per protocol.

## ***Setting***

This feasibility trial took place in Chitungwiza, a high-density dormitory town (population 456,000) situated approximately 30 kilometers from the capital city of Harare, Zimbabwe. We selected two comparable suburbs as study sites, 8 kilometers apart to reduce risk of contamination. Island Hospice and Healthcare Zimbabwe (IHH) collaborated on the study given their longstanding involvement in Chitungwiza, and connections to the local community groups, churches, local government structures. Lay community workers were recruited amongst the community leaders that Island Hospice and Healthcare Zimbabwe had been working with in other programs in Chitungwiza.

## ***Intervention***

The 9-cell bereavement tool's structure i) draws on participants' existing knowledge, models an open-minded, non-judgmental approach, recognizes the diversity of grief within individuals, genders, families, cultures, and faiths, and encourages participants to listen to others while breaking down previously held beliefs about how grief can be expressed. It draws on Stroebe and Schut's oscillation model (1998)<sup>31</sup>, which focuses on people's oscillation between the process of grief in itself, together with re-engaging with a life transformed by the loss<sup>32</sup>. The intervention uses 9 'cells' to help an individual identify i) personal feelings in relation to their bereavement; ii) judgmental attitudes, religious tenets, lack of understanding, and iii) effects of family and community support. A 9-cell table (see Figure 1) is constructed, the horizontal line representing three time points after the loss of a loved one: i) the immediate, ii) a little while later, and, iii) a long time after the event. The vertical divisions examine i) the individual's feelings, ii) how these are outwardly expressed, and, iii) what is culturally permissible.

Discussions comparing the different cells in the 9-cell table and introducing evidence-based alternative points for consideration, act as the intervention. They help participants realize the gap between what they feel and what is permissible, and then work together to develop a personal bereavement approach. Discussion can take place in either direction, first examining feelings along a timeline, or exploring how expressions differ between immediate feelings, what is outwardly expressed and what is permissible. The facilitator merely asks for thoughts or personal experiences to be identified in each cell, probing for further details, differences between experiences in the group and, in particular, contrasting thoughts relating to rituals, religious teachings and individual interpretations of these, while offering optional ideas for reflection.

## ***Procedures***

### **Recruitment**

There were three levels of recruitment: 1) Community leaders were identified, 2) Community leaders then recruited lay community members to participate in the one-day intervention training (i.e. interventionists), 3) Interventionists then recruited trial participants and delivered the intervention to them post baseline (T0) data collection.

**Week 1:** The recruitment process began with study engagement using existing relationships that Island Hospice and Healthcare has with community leaders (CL) from the selected two communities in Chitungwiza. The rationale, goals and intended procedures of the study were explained, community leader permission was sought to undertake the research, and support from the community leaders requested to deliver the study.

Community leaders were tasked to invite 25 people (i.e. potential interventionists) from their respective communities or clusters, who they knew to have suffered loss in the past 6 to 18 months to attend a meeting. This allowed for a total of 50 potential interventionists representing both clusters.

**Week 2:** *Separately*, the potential interventionists, from each of the two clusters, were provided with information about the study and asked to give informed consent to indicate their willingness to participate in the study. They completed a short, self-administered questionnaire that assessed their socio-demographic background and bereavement history. Trained surveyors provided instruction to the interventionists, and were available to assist with clarification of any questions where required. None of the two clusters were aware which of them was the intervention and which was the control group.

The interventionists from each community were tasked with identifying 2 to 3 people according to the following criteria: a) at least 18 years old, b) resident within their neighbourhoods, c) someone with whom they interacted with on a daily basis, d) whom they know to have been bereaved in the past 6 months, e) would have the ability to either verbally consent or be able to provide written consent, f) be expected to attend and participate in the study.

**Week 3:** Potential participants who met all of these criteria attended a meeting where information regarding the study was shared. Before the interventionists started the recruitment process, a focus group discussion with a sub-sample of them, was conducted to assess the feasibility of them identifying potential trial participants and inviting them to meet with the researchers to learn more about the study.

## Data collection

Following written informed consent, research assistants collected sociodemographic information and bereavement history from trial participants. Trial participants also completed three psychosocial measures at baseline, then at 3 months (T1) and 6 months (T2) post randomization: the Shona Symptom Questionnaire (SSQ)<sup>33</sup> a screening tool for mental health, the Medical Outcomes Study - Social Support Survey (MOS-SSS)<sup>34</sup> which measures social support and the Texas Revised Inventory of Grief (TRIG)<sup>35,36</sup> which measures intensity of a person's grief. A question also asked if the participant had contact with anyone within the other geographical cluster.

## Allocation

The two study sites were randomized following T0 data collection by a statistician (independent of the study) at Kings College London to intervention or wait-list control.

## ***Focus group data***

Focus group discussions were held with interventionists to examine their experience and use of the training material, implementation and processes within the intervention. Discussions were captured through detailed notes captured by a note-taker and translated from the vernacular (Shona) to English.

## ***Sample size***

Past research has recommended sample sizes of 24 and 50<sup>37-40</sup>. For this feasibility study, sample sizes for community leaders were set at 25 in total, and for interventionists, at 25 per cluster; with the trial participants set at 75. The target was 50, however a reach of 75 was set, to allow for any challenges in recruitment and for possible attrition from the study.

## ***Analysis.***

The analysis was conducted as follows, and in line with the study objectives.

1. To determine the feasibility of conducting a randomized cluster trial in terms of recruitment and retention;

Numbers of both interventionists and trial participants recruited, and participating in the trial were recorded at baseline (T0), midline (T1) and endline (T2). At the end of each data collection phase, researchers analysed the flow of work to assess what worked and what needed adjustment in allowing a conducive environment for optimum data collection from the participants. Where any process may have affected the resultant figures, these were documented in short reports to be used as reference points for the end of trial report.

2. To assess the feasibility of implementing the 9-cell bereavement tool;

This was established in part through qualitative observation of the discussions that emerged during intervention implementation and through a discussion with the facilitators themselves post-study to assess (a) their experience in implementing the intervention, (b) their assessment of the experience of the interventionists as they participated in the intervention, and (c) to highlight what made the process feasible. Framework analysis was used to analyse the qualitative data collected from the discussion.

3. To determine whether there would be contamination between the clusters;

Contamination questions were provided to both the intervention and the control group, to assess whether any of the participants had engaged, visited or spoken to either party in between the data collection dates. Questions were centered on whether they had visited the intervention community, and/or been in contact with a participant from the intervention group who may have shared with them, information about the study. Responses were manually assessed to see if any had contact and had been 'contaminated'.

4. To assess the acceptability and completeness of measures and data;

Questionnaire data from quantitative data collected at baseline (T0), midline (T1) and endline (T2), were entered into an Excel spread sheet. These were then imported into Stata V15 software for analysis<sup>41</sup>. All participants' data were analysed according to the community in which they were recruited and randomised.

We tabulated all the variables for each measure used from baseline, midline and endline and each variable with missing data is recorded with reasons provided. We summed up the number of participants who completed measures at baseline, midline and endline.

5. To identify trial participants' views and experience of the intervention and its mechanisms of action;

Focus group discussions were held with the trial participants at the end of the trial. Framework analysis with emerging themes around specific questions was used to analyse their responses.

6. To estimate potential effect size

We calculated baseline and final scores for outcome measures (SSQ, TRIG, and MOS-SSS) and summarised within-group changes for each outcome measures and for differences between communities at the final timepoint.

We performed longitudinal analysis using multilevel modelling for repeated measures with generalised linear latent and mixed models (GLAMM) which accounts for correlated or clustered data over time in analysing categorical data. Each outcome was divided into quartiles, as GLAMM operates more successfully with fewer categories of the dependent variable, and was adjusted by baseline score. This enabled comparison of the effect of the intervention on all dependent variables.

7. To determine whether a full trial is warranted.

The combined results from the above analysis would warrant whether a full trial were possible, with the ability of conducting a full RCT in terms of recruitment and retention; successful implementation of the intervention; little or absent contamination between the clusters; acceptability and completeness and measures and data; identification of trial participant's views and experience of the intervention and its mechanisms of action; and the ability to estimate potential effect size.

### ***Ethical approvals***

Ethical approvals were obtained from the Zimbabwe National Medical Research Council of Zimbabwe (MRCZ/A/2230) and from King's College London (HR-17/18-5415). In addition, the study sought clearance from the local community police and researchers carried all clearance documents with them throughout the study.

# Results

Results are reported with each corresponding objective.

1. Objective 1: Determining the feasibility of conducting a randomized cluster trial in terms of recruitment and retention;

The process of a randomized cluster trial was possible, the study was able to recruit 143 trial participants, which at +95% is more than the minimum sample size recommendation of 75%. And because we allowed over-recruitment to mitigate loss to follow-up in the duration of the study, we were able to retain numbers in line with sample size suggestions.

For the intervention group (Seke) we retained 52 of the 57 who were initially recruited. For the control group (St. Mary's) we retained 46 of the 86 initially recruited. Suggested sample size had been calculated 50, so we over recruited by 36 participants. Despite substantial loss to follow up (explained below), this did not negatively impact our retention targets.

## Recruitment of interventionists

Recruitment was feasible in the suggested three (3) weeks. Community leaders managed to recruit 56, allowing for an additional number of six potential interventionists. This helped counteract any possible attrition from the study.

## Recruitment of trial participants

We recruited a total of 143 trial participants (T0); 57 from the intervention group; 86 from the control group. At midline (T1) we retained 52 from the intervention group and 54 from the control group. At endline (T2), we retained 52 from the intervention group and 46 from the control group. This is illustrated in Figure 2: the CONSORT Flow Chart below and attached:

## Mitigating retention challenges

A few challenges were experienced in setting the initial dates indicated for midline and endline data collection. These however, did not affect the quality of data collected. Midline and endline dates were extended in July 2018 to accommodate post-election rules that forbade congregation in large numbers. They were extended again in September 2018 in response to the Cholera epidemic<sup>[1]</sup> which required the team to post pone meetings. Moreover, endline data collection, was collected in the control group first then the intervention group as opposed to the intervention group first as was the case with baseline and midline. However, there was no negative effect to the data collection.

2. Objective 2: Feasibility of implementing the 9-cell bereavement tool

## Intervention delivery, adherence and impact

The two facilitators ascertained that the intervention was delivered correctly. This was established in part through qualitative observation of the discussions that emerged during intervention implementation, and through a discussion with the facilitators themselves post-study. As they went through the 9 cells, the facilitators found interventionists processing unresolved past grief, and reflecting on the cultural expectations around discussing the loss of a loved one. Interventionists shared their own stories of grief and their comments indicated that they were reflecting on the processes.

Table 1 illustrates the facilitators' experience in administering the intervention and the interventionists' experience of grief following the intervention. We recognise that a once off single session may not always yield 100% positive change for all interventionists who take part in the 9-cell bereavement intervention as it may take more than the one-day session for interventionists to reshape people's manner of fully expressing their grief. Some people may need more time to absorb the value of this new approach.

3. Objective 3: Determining whether there would be contamination between the clusters;

Contamination screening questions completed by trial participants in both communities found that no contamination was reported.

4. Objective 4: To assess the acceptability and completeness of measures and data;

### ***Baseline demographic data (T0)***

Baseline data were collected from all 143 participants before the communities were randomly allocated to either receive the 9-cell intervention (n=57, the intervention group) or be a part of the control group (n=86, the control group). See Table 2.

At baseline, participants demographic characteristics in the two communities were not similar. For example, there were many more participants aged 18-25 years in the control group compared to the intervention group (n=17;20% vs. n=3; 5.26%), many more participants were formally employed in the control arm compared with the intervention arm (n=20; 23.26% vs n=6; 10.53%), and many more participants from the control group attended secondary education (n=62; 72.09% vs 28; 49.12%).

### ***Baseline measures***

Baseline measures for the Shona Symptom Questionnaire (SSQ) and the Texas Revised Inventory of Grief (TRIG) were broadly similar: The mean (SD) scores for the SSQ were 10.37 (2.16) in the intervention group compared with 8.83 (2.77) in the control group while the TRIG mean (SD) score at baseline were 17.24 (7.36) in the intervention group and 19.53 (8.72) in the control group. However, baseline scores for the Medical Outcome Study, Social Support Survey (MOS-SSS) were not similar. The mean (SD) scores in the intervention group were 45.67 (16.02) compared with 51.85 (15.09) in the control group.

### ***Midline and endline measures (T1 - 3 months)***

### *Retention of trial participants*

Of the 143 participants randomised, 106 (52 intervention, 54 control) participants were followed-up at three months (T1) and 98 were followed up at six months (T2) (52 intervention and 46 control). Participants were lost to follow-up as a result of the cholera outbreak, the presidential elections, and their phone numbers not being reachable. These causes were similar in both communities, however there were more participants who were lost to follow-up at midline (T1) in the control group n=32 compared with n=5 in the intervention group. At month six there were n=40 participants who were lost to follow-up in the control group while there were n=5 in the intervention group. Of the 98 participants who completed the trial, complete data were available for all the outcomes except the MOS-SSS which had n=18 missing responses (n=7 in the intervention group and n=11 in the control group). See Table 3 and 4.

### **Qualitative data**

Data from focus group discussions supports the quantitative findings. It suggests that interventionists appreciated the messages that emerged from the 9-cell process. They spoke of being able to handle their own grief with more empathy which in turn allowed them to be more present for the trial participants. Interventionists shared examples of trial participants processing their grief more fully which allowed them to move through their emotions to a space where they could function again. Interventionists also reported a ripple effect whereby trial participants reported to them that they had found the process so liberating that they had shared it with others in their community who were struggling with their grief. See Table 1.

When asked how the intervention could be improved, interventionists emphasized the importance of remaining connected, in order to support each other, and working more collectively. In addition, they requested access to additional information on various illnesses (such as cancer, stroke, hypertension, and diabetes) in order to be more fully informed in their discussions with the bereaved. See Table 1.

5. Objective 5: Identification of trial participants' views and experience of the intervention and its mechanisms of action;

The focus group discussion conducted with trial participants also indicated that a ripple effect was experienced with data showing that those who the interventionists had initially reached out to also reached out to additional individuals suffering from loss within their own communities and families.

There were several internal rewards that both the interventionists and the trial participants experienced and shared. Firstly, they reported that just by participating in a program that allowed them to be open about the pain they experienced from the loss of loved ones was a process they appreciated. Secondly, it allowed them to heal and be able to share this process with those close to them. Thirdly, through their own capacity and self-motivation, they were able to share with those outside of their immediate communities.

6. Objective 6: Estimating potential effect size

## Statistical analysis of measures

### 1) SSQ

Both groups showed improved (decreased) SSQ scores from baseline to midline, see Table 5 (Figures 3 and 4). There was greater decrease among participants from the intervention group. The mean (SD) change in the intervention group was -.90 (3.89) and -.02 (3.83) in the control group. However, from midline to endline SSQ mean (SD) scores did not change in both groups. A multilevel modelling, showed that the change was not statistically significant between the two communities at six months (regression coefficient -.15, 95% confidence interval -1.02 to .71;  $P=0.73$ ). The number of bereaved relatives/friends was a predictor for worse mental health outcomes. Participants who lost three family members/friends were associated with greater (worse) psychological outcomes compared with those who lost one family member (regression coefficient 2.22, 95% confidence interval .87 to 3.58;  $P=0.001$ ) (See table 5).

### 2) MOS-SSS

Both groups showed improved (increased) MOS-SSS scores from baseline to midline, see Table 6 (Figures 5 and 6). The mean (SD) change in the intervention group was 3.85 (23.19) and .9 (20.87) in the control group. From midline to endline MOS-SSS mean (SD) scores continued to increase at 2.73 (22.9 in the intervention group and 1.2 (24.24) in the control group). The greatest change was observed in the intervention community from baseline to endline. The mean (SD) change was 7.92 (23.95) compared with the control (2.52 (22.47)). However, multilevel modelling indicated that there were no statistically significant differences between the two communities at six months (regression coefficient .27, 95% confidence interval -.75 to 1.28;  $P=0.61$ ).

Age, employment status, and number of bereaved relatives/friends were predictors of social support. Compared with participants who were  $\leq 25$  years of age, participants between 26-35 years (regression coefficient 2.04, 95% CI .40 to 3.67;  $P=0.015$ , and those between 36-45 years of age (regression coefficient 2.43, 95% CI .74 to 4.12;  $P=0.005$ ) and those who were  $\geq 56$  years of age (regression coefficient 3.43, 95% CI 1.01 to 5.86;  $P=0.005$ ) were all associated with better social support (older participants had a better social support).

Participants who were employed including farmers had better social support compared with those who were not employed (regression coefficient 1.72, 95% CI .23 to 3.21;  $P=0.023$  and regression coefficient 2.76, 95% CI .18 to 5.34;  $P=0.036$ ) respectively. Participants who lost two relatives/family members had better social support compared with those who had lost one family member (regression coefficient 1.68, 95% CI .44 to 2.93;  $P=0.008$ ).

### 3) TRIG

Both groups showed improved (increased) TRIG scores from baseline to midline, see Table 7 (Figures 7 and 8). Mean (SD) change in the intervention group was 0.10 (9.64) and 0.65 (13.28) in the control group. However, from midline to endline TRIG mean (SD) scores worsened in the control group (-1.34;11.64)

while mean (SD) scores continued to improve in the intervention group (0.42; 12.80). Overall, from baseline to endline, the mean (SD) change was greater in the intervention community (0.52; 12.93) compared with the control arm (0.13; 10.36).

In multilevel modelling, there were no significant differences between the two communities at six months (regression coefficient .43, 95% confidence interval -.32 to 1.18; P=0.27). In a univariate analysis, participants who were not employed had lower (worse) TRIG scores compared with those who were self-employed (regression coefficient -.88, 95% confidence interval -1.71 to -.06; P=0.035).

7. Objective 7: Determining whether a full trial is warranted.

Given the success of implementing this randomised cluster trial in terms of recruitment and retention; successfully implementing the 9 cell bereavement tool; acceptability and completeness of measures and data; collection and documentation of trial participants' views; positive experience of the intervention and its mechanisms of action; and, ability to estimate potential effect size; a full trial is warranted. In addition, a full trial will at first level, lend to the paucity in data on bereavement in Africa, and at second, provide data that both supports and promotes the need for and the success of locally based interventions in palliative care.

[1] WHO Emergences preparedness response: Cholera\_Zimbabwe: <https://www.who.int/csr/don/05-october-2018-cholera-zimbabwe/en/>

## Discussion

**As per its objectives**, the study was able to recruit at least 75% of the suggested sample size of interventionists and trial participants within 3 weeks. We were also able to implement strategies to mitigate loss to follow up, and thus able to stay within the sample size suggestions of the protocol. The 9-cell bereavement intervention was delivered as intended, and the processes of a randomised cluster trial were possible. Anticipated effect as indicated in the process data was not only likely but was beneficial beyond the initial participating participants. No adverse effects or side effects were experienced in the study.

**The aim of this study to:** (1) assess the feasibility of implementing the 9-cell bereavement tool at community level, (2) determine the feasibility of evaluating the intervention and 3) elicit participants' views and experiences about the 9-cell intervention training and delivery. We were able to both implement and evaluate the 9-cell bereavement tool at community level and to evaluate it using a cluster randomized control trial design. This was the first time this locally and contextually developed bereavement tool, was tested and successfully implemented in Zimbabwe.

**Analysed data shows that the 9-cell bereavement tool was effective** in that it allowed interventionists to share and learn from their own grief process. Participants were given a platform to openly talk about their grief, in an open, safe space. Though they may have suffered loss in a time period that seemed a long

time ago, because they had not processed the grief, they still acutely felt the pain. The 9-cell bereavement tool allowed them to address this grief and pain. We do recognize that for some, more time to absorb the value of this new approach of understanding grief and expressing pain is required. This was also discerned when the intervention was delivered in Tamil Nadu, India where it was found that group home visits following the exposure to the intervention helped facilitators recognize the value of the approach more deeply.

Data reinforces that participants reached out within their immediate vicinity, as required in the study, but in addition, reached out beyond their own communities. A ripple effect was experienced with data showing that those who the interventionists had initially reached out to also reached out to additional individuals suffering from loss within their own communities and families.

There were several internal rewards that both the interventionists and the trial participants experienced. Firstly, there was benefit from participating in a program that allowed them to be open about the pain they experienced from the loss of loved ones. Secondly, it allowed them to begin to heal and be able to share this process with others. Thirdly, through their own capacity and self-motivation, they were able to share lessons they learnt about grief and the bereavement process with others.

Opportunities to support more people were attained and are ongoing with requests for wider exposure to the 9-cell bereavement tool, making sure to include people in the rural areas where exposure to such programs were not as widespread or easily accessible. Media, including the radio, was suggested as an additional means of information distribution for wider reach to rural areas

Requests for more information related to non-communicable diseases such as cancer, high blood pressure, stroke and diabetes, were requested as community members felt that these 'modern day diseases' were not well understood in their communities.

Collectively, these data establish the important role a healthy grieving process can play in the lives of the bereaved; how context-specific, culturally appropriate, and individually- tailored support is important in light of the intersectionality of individual life experiences; and together highlight the need to conduct a rigorous evaluation of the 9-cell bereavement tool.

### **Trial limitations**

As the focus on the study was resource-led and so laser-focused on the aim of assessing the feasibility of implementing the 9 cell bereavement intervention, we did not collect qualitative data from the trial participants on their experience they had from the interventionists who delivered the intervention into the communities. We do however, have anecdotal data from the interventionists themselves on the effectiveness of the tool, from their own feedback in communication with the trial participants. The evidence indicated that the trial participants positively experienced the intervention, allowing them to share it with loved ones both in their community and in their rural areas, who had been bereaved. This is illustrated in Table 1. Interviews with trial participants can be formalized for future studies.

There were a few instances where interventionists, that is, those who were taken through the intervention by our facilitators, revealed in their contributions during the intervention, that they may have needed more time to be immersed into the concept of the 9-cell tool. For future interventions, it is to be noted that though the 9-cell process is structured as a full day session, the number of days is flexible to allow for deeper immersion around different aspects that each community and group may need depending on their understanding and contextual relationships with death.

Due to communication processes and resources, it was not possible for this study to blind the researchers on which was the control group and which was the intervention group. However, neither of the communities were aware themselves, which was the control group and which was the intervention group. Contamination questions used also showed that there was no interaction of the participants from each group throughout the duration of the study.

Loss to follow-up of participants can be reduced in future studies, by having a participant locator form that has alternate ways of reaching participants for reminders and any change of dates of data collection. Alternate ways of reaching participants would include, contact details of next of kin and or other persons in their vicinity who would be able to better reach them, should their primary contact details not be available at the time of contact. The strategy used in this study, is that though we had a high loss to follow-up in one of the communities due to communication challenges and time frames, we had inflated the sample sizes as a way to counter-act any events such as local instruction to reduce and or stop gatherings for a specified time.

### **Generalisability**

The scales used for this study, that is, the SSQ, the MOSSS and the TRIG were effective in that, the SSQ was locally developed and tested in other countries in the region and in another low-income country, India. It was therefore, locally, culturally and contextually appropriate for Zimbabwe; the MOSSS and the TRIG were tested for validity in different low to middle income spaces around the world, allowing them to be feasible for the Zimbabwean context. The combination of both local, contextual and inclusive scales are encouraged in all studies for relevance, feasibility and validity. As a result, effective delivery processes and resulting uptake is increased.

## **Conclusion**

The 9-cell bereavement tool has already been successfully implemented in different cultural settings, including southern Africa (in South Africa), East Africa (in Tanzania), and India. However, the need for rigorous evaluation of scarce, culturally specific and community-based interventions in sub-Saharan Africa, highlights the urgent need to carry out a full trial in this subject matter. Bereavement and bereavement interventions are an essential and core component of palliative care; and more so in low resourced countries whose health systems are already struggling from high mortality rates in HIV, tuberculosis, cancer, malaria, suicide and other communicable diseases. A full trial is not only warranted as a contribution to the currently sparse literature in this regard, but has an enormous potential public

health benefit in supporting and saving lives in many more under-resourced and under-supported countries.

## **Declarations**

### *Ethics approval and consent to participate*

Ethical approvals were obtained from the Zimbabwe National Medical Research Council of Zimbabwe (MRCZ/A/2230) and from King's College London (HR-17/18-5415).

### *Consent for publication*

The manuscript does not include any individual person's data.

### *Availability of data and material*

Datasets generated during and analysed during the current study are not publicly available in regards to confidentiality of participants, but are available from the corresponding author on reasonable request.

### *Competing interests*

There are no financial or non-financial competing interests to declare.

### *Funding*

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### *Authors' contributions*

All authors read and approved of the manuscript

### *Acknowledgements*

No one else besides the aforementioned authors within this article contributed to its writing.

### *Consort Compliance*

This written account of the feasibility trial complies with the CONSORT statement's extension to randomized pilot and feasibility trials.

## **Additional material**

Additional File 1.pdf. Flow Diagram.

Additional File 2.doc. Tables and Figures. Data

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## Table

**Table 1: Responses from interventionists**

Facilitator's experience	
Summary of comments from Intervention facilitators	Corresponding verbatim comments
Delivery of the intervention was implemented as intended and with the desired effects:	<i>They [interventionists were] fully engaged... they worked hard...we had brilliant results. It was an extremely positive experience: (Intervention Facilitator 1)</i>
Participants were given a platform to openly talk about their grief, in an open, safe space. Being taken through the 9-cell bereavement tool, allowed participants who had not processed past grief, to address their unresolved grief and pain. Supporting verbatim comments concerning this process were as follows:	<p><i>Just creating a supportive and safe atmosphere to express their grief: that facilitated the entire process right until the end.</i></p> <p><i>They [interventionists] were free and were supported throughout the process: (Intervention Facilitator 2)</i></p> <p><i>They [interventionists] were every engaged from the outset. They were able to understand what the intervention was about. They were able to share about their own grief and reflect on their emotions: (Intervention Facilitator 1)</i></p>
Experience of the interventionists with the 9-cell tool post intervention	
Summary	Verbatim comments
Experiencing grief post-intervention	<i>It was very helpful for me to be able to deal with loss in my life; I was one of those people who would think about the person I lost wishing they were around to help me. But I have realized through the training and conversations with others that it is all part of life, we are now able to help others and to explain to them that this programme ... has been helpful to me and how I can deal with my loss (Interventionist 1)</i>
	<i>I faced loss recently, but I easily accepted it as a result of the training we received... I no longer think too much about my loss, of course I can cry but it is better compared to before (Interventionist 6)</i>
	<i>I am grateful of this programme because I have now accepted the death of my husband and I feel better, I was not able to work well but now I am stronger and can take care of the children (Interventionist #7)</i>
	<i>I lost a loved one in May and I was able to accept what had happened because of the training that we had received in March, it was easier for me to accept (Interventionist #2)</i>

	<p><i>When I left the training, I understood that it is important to cry and let it out. When I got home I decided to close myself in a room and start crying, I cried for a long time until I felt that I had let everything out. I took out all the pictures I had taken down, the clothes I did not want to wear anymore because I felt no more pain inside me (Interventionist #12)</i></p>
<p>Helping others</p>	<p><i>The information we received on helping others who have lost their loved ones was really helpful to me, I sit down with them and explain to them that we all have a time to live on earth and that we should accept that, we should not lose hope and ask ourselves too much about tomorrow, it is God's will. Some would ask if they will be able to get over it, but I encouraged them to accept it because they may become suicidal [if not supported] (Interventionist #10)</i></p> <p><i>I realized that knowledge is power, if someone has knowledge they are able to overcome any challenges. When at a funeral if you have knowledge you will be able to know how to help someone who has faced a loss (Interventionist #9)</i></p> <p><i>After the training I was unfortunate to lose three very close relatives one after the other till about end of May, but I was quick to accept and move on and also counsel my other relatives (Interventionist #1)</i></p> <p><i>I made sure that I cried a lot so that I could let go of the hurt myself, and then it became easier for me to go out into the community to help others and give them advice (Interventionist 5)</i></p> <p><i>When I went to a neighbor's funeral, I got there and there was chaos and everyone was just crying. I got there and started putting everything in order making sure everything is in its place and planning what to cook. I realized that I need to be strong in that situation because if I had joined the people who were crying nothing would have come out of it, so I brought people together and made sure things were in this place this way it helped to get their mind off crying (Interventionist #8)</i></p>
<p>Changes in your interactions with others following 9-cell</p>	<p><i>When I attended a family funeral recently I noticed that people were much happier at the funeral than before so much it did not even</i></p>

	<p><i>seem as if we were at a funeral. The counselling that I have given them has helped them to quickly accept (Interventionist #6)</i></p> <p><i>There has been some change because others will go for days without eating but now I have noticed change in those I have spoken to that they can eat normally even after the funeral (Interventionist #14)</i></p> <p><i>At times people would fear to wear clothes of the deceased person given to them after the funeral, but through our training and the talks that I have had with family members they have come to accept their loss and are now more willing to use those things left to them by their loved ones (Interventionist #15)</i></p>
<p>Comments from interventionists reporting back on the results they saw and experienced in her community</p>	<p><i>When we started this was just here in Chitungwiza but the program managed to help someone in Hurungwe, Mawere [rural area in Zimbabwe] (Female respondent #9)</i></p> <p><i>In the community those whom we talked to are now able to help others (Female respondent #4)</i></p>
<p>Internal rewards that both the interventionists and the trial participants experienced, in firstly participating in a program that allowed them to be open about the pain they experienced from the loss of loved ones, and secondly, to heal and be able to share this process with others; were strong enough for them, in their own capacity, to continue sharing the lessons they learnt about the bereavement process.</p>	<p><i>Individually it helped me because I was one of the people who could not talk about these issues but now I can help others (Male respondent #6)</i></p> <p><i>I also helped my sister (Female respondent #3)</i></p> <p><i>It helped because they [trial participants] can now interact with others (Female respondent #9)</i></p>
<p><b>c. Rolling out the intervention</b></p>	
<p>Summary of verbatim comments</p>	<p>Verbatim comments</p>
<p>Requests of wider exposure to the 9-cell bereavement tool, to include people in the rural areas, where exposure to such programs were not as widespread or as easily accessible.</p>	<p><i>There are some people who are far from here and also they need that help. There are some people who are lonely who don't have someone to talk to. So there is need that you help even those who will not be eating...The program is good because it helps heal the wounds, you should also do it in the rural areas (Male respondent #11)</i></p>

	<i>If we are many we can also refer others to areas where some of us can be found (Male respondent #5)</i>
Suggested use of media including the radio, as an additional means of information distribution for wider reach to rural areas, and to others who may not have the internal motivation to reach out:	<p><i>These workshops will help them realize that they are not the only ones with problems... hence they will heal fast (Female respondent #4)</i></p> <p><i>I think it will be of much help if you put it on radio since this will help a lot of people like other programs on radio (Male respondent #1)</i></p> <p><i>We can console others through the phone (Female respondent #8)</i></p>
Requests and the need for more information related to the different types of non-communicable diseases were needed as there was a general consensus that community members did not fully understand prevention and healing processes of these 'new' types of illnesses:	<p><i>Sudden death are common (Female respondent #4)</i></p> <p><i>Cancer also is a threat and it's scary (Male respondent #1)</i></p> <p><i>Some people have [a] stroke because of [the] death because the breadwinner will be dead, [and they feel they can't survive without someone taking care of them; they have a stroke from worrying about the future] (Male respondent #1)</i></p>

**Table 2: Summarises demographics the comparison of the participants from the two communities**

Variables	Intervention (Seke) (n=57)	Control (St Mary's) (n=86)
Age in years <sup>[1]</sup>		
18-25	3 (5.26)	17 (20)
26-35	11 (19.30)	19 (22.35)
36-45	16 (28.07)	25 (29.41)
46-55	13 (22.81)	14 (16.47)
46/max	14 (24.56)	10 (11.76)
Male/Female gender	11 (19.30)/ 46 (80.70)	13 (15.12)/ 73 (84.88)
Black race/other race	56 (98.25)/1 (1.75)	85 (98.84)1 (1.16)
Importance of religious beliefs		
Not important at all	1 (1.75)	0
Not very important	1 (1.75)	1 (1.16)
Fairly important	2 (3.51)	1 (1.16)
Very important	53 (92.98)	83 (96.51)
Don't know	0	1 (1.16)
Religion		
Catholic	7 (12.28)	9 (10.47)
Presbyterian	15 (26.32)	17 (19.77)
Apostolic	10 (17.54)	19 (22.09)
Pentecostal	18 (31.58)	26 (30.23)
Other	7 (12.28)	15 (17.44)
Employment		
Not employed	18 (31.58)	29 (33.72)
Formally Employed	6 (10.53)	20 (23.26)
Self-employment	30 (52.63)	28 (32.56)
Farmer	3 (5.26)	9 (10.47)
Education		
No education	6 (10.53)	5 (5.81)
Primary	14 (24.56)	18 (20.93)
Secondary	28 (49.12)	62 (72.09)
A levels and above	9 (15.79)	1 (1.16)
Number of bereaved relatives: mean (SD)	2.33 (1.33)	2.05 (1.23)
Death was Sudden vs gradual		
Sudden	45 (78.95)	72 (83.72)
Gradual	12 (21.05)	14 (16.28)
Death was expected vs unexpected		
Expected	5 (8.77)	12 (13.95)
Unexpected	52 (91.23)	74 (86.05)

Table 3: Outcomes scores for participants at baseline, midline and endline

Outcomes	Intervention (n=57)	Control n=86
Shona Symptom Questionnaire total (0-14) (SSQ) at baseline (T0) mean (SD) <sup>i</sup>	10.37 (2.16)	8.83 (2.77)
Shona Symptom Questionnaire total (0-14) (SSQ) at midline (T1) mean (SD) <sup>i</sup>	9.48 (3.08)	8.59 (3.00)
Shona Symptom Questionnaire total (0-14) (SSQ) at endline (T2) mean (SD) <sup>i</sup>	9.48 (3.08)	8.57 (3.03)
Shona Symptom Questionnaire total (0-14) (SSQ) at baseline (T0) median (IQR) <sup>i</sup>	11 (9-12)	9 (7-11)
Shona Symptom Questionnaire total (0-14) (SSQ) at midline <sup>I</sup> (T1) median (IQR) <sup>i</sup>	10 (7-11)	9.5 (8-10)
Shona Symptom Questionnaire total (0-14) (SSQ) at endline <sup>i</sup> (T2) median (IQR) <sup>i</sup>	10 (7-11)	9.5 (7-10)
Medical outcome Study (MOS), Social Support Survey (SSS) total (18-90) at baseline (T0) mean (SD) <sup>ii</sup>	45.67 (16.02) <sup>[2]</sup>	51.85(15.09) <sup>[3]</sup>
Medical outcome Study (MOS), Social Support Survey (SSS) total (18-90) at medline (T1) mean (SD) <sup>ii</sup>	50.28 (16.35) <sup>[4]</sup>	53.55 (16.02) <sup>[5]</sup>
Medical outcome Study (MOS), Social Support Survey (SSS) total (18-90) at endline (T2) mean (SD) <sup>ii</sup>	51.98 (17.89) <sup>[6]</sup>	54.57 (16.15)
Medical outcome Study (MOS), Social Support Survey (SSS) total (18-90) at baseline (T0) median (IQR) <sup>ii</sup>	43 (32-56) <sup>3</sup>	52 (39-66) <sup>4</sup>
Medical outcome Study (MOS), Social Support Survey (SSS) total (18-90) at medline (T1) median (IQR) <sup>ii</sup>	46 (37-60) <sup>5</sup>	53 (43-67) <sup>6</sup>
Medical outcome Study (MOS), Social Support Survey (SSS) total (18-90) at endline (T2) median (IQR) <sup>ii</sup>	52 (34-68) <sup>7</sup>	54 (43-69)
Texas Revised Inventory of Grief (TRIG) total scores (11-55) mean (SD) at baseline (T0) <sup>iii</sup>	17.24 (7.36)	19.53 (8.72)
Texas Revised Inventory of Grief (TRIG) total scores (11-55) mean (SD) at medline (T1) <sup>iii</sup>	17.85 (8.22)	20.09 (9.71)
Texas Revised Inventory of Grief (TRIG) total scores (11-55) mean (SD) at endline (T2) <sup>iii</sup>	18.27 (9.01)	19.22 (7.31)
Texas Revised Inventory of Grief (TRIG) total scores (11-55) median (IQR) at baseline (T0) <sup>iii</sup>	14 (11-22)	17 (12-24)
Texas Revised Inventory of Grief (TRIG) total scores (11-55) median (IQR) at medline (T1) <sup>iii</sup>	15.5 (11-20.5)	17.5 (12-25)
Texas Revised Inventory of Grief (TRIG) total scores (11-55) median (IQR) at endline (T2) <sup>iii</sup>	15 (11-23)	17.5 (15-21)

i SSQ (low scores better outcomes)

ii MOS-SSS (higher scores better outcomes)

iii TRIG (higher scores better outcomes)

**Table 4: Change outcomes for outcome variables N=43**

<b>Shona Symptom Questionnaire (SSQ)</b>	Intervention (n=57)	Control (n=86)
Shona Symptom Questionnaire total (SSQ) at baseline (T0) mean (SD)	10.37 (2.15)	8.83 (2.27)
Shona Symptom Questionnaire total (SSQ) at midline (T1) mean (SD)	9.48 (3.08)	8.59 (3.00)
Mean change (SD) from baseline	-.90 (3.89)	-.02 (3.83)
Shona Symptom Questionnaire total (SSQ) at end line (T2) mean (SD) (n=52 missing)	9.48 (3.08)	8.57 (3.03)
Mean (SD) change from baseline	-.90 (3.89)	-.28 (3.79)
Mean (SD) change from midline	0	0
<b>MOS-SSS</b>		
Medical outcome Study (MOS), Social Support Survey (SSS) total at baseline (T0) mean (SD)	45.67 (16.02) <sup>[7]</sup>	51.85(15.09) <sup>[8]</sup>
Medical outcome Study (MOS), Social Support Survey (SSS) total at medline (T1) mean (SD)	50.28 (16.35) <sup>[9]</sup>	53.55 (16.02) <sup>[10]</sup>
Mean change (SD) from baseline	3.85 (23.19)	.9 (20.87)
Medical outcome Study (MOS), Social Support Survey (SSS) total at endline (T2) mean (SD)	51.5 (17.98) <sup>[11]</sup>	54.57 (16.15)
Mean change (SD) from baseline	7.92 (23.95)	2.52 (22.47)
Mean change (SD) from medline	2.73 (22.9)	1.2 (24.24)
Medical outcome Study (MOS), Social Support Survey (SSS) total (18-90) at baseline <sup>ii</sup> (T0) median (IQR)	43 (32-56) <sup>[12]</sup>	52 (39-66) <sup>[13]</sup>
Medical outcome Study (MOS), Social Support Survey (SSS) total (18-90) at medline <sup>ii</sup> (T1) median (IQR)	46 (37-60) <sup>[14]</sup>	53 (43-67) <sup>[15]</sup>
median change from baseline	6 (-13 to 20)	1 (-14 to 14)
Medical outcome Study (MOS), Social Support Survey (SSS) total (18-90) at endline <sup>ii</sup> (T2) median (IQR)	52 (34-68) <sup>[16]</sup>	54 (43-69)
median (IQR) change from baseline	8 (-5 to 29)	6.5 (-15 to 20.5)
median (IQR) change from midline	2.5 (-15 to 15)	3 (-17 to 18)
<b>Texas Revised Inventory Grief (TRIG)</b>		

TRIG mean (SD) at baseline (T0)	17.24 (7.36)	19.53 (8.72)
TRIG mean (SD) at medline (T1)	17.85 (8.22)	20.09 (9.71)
Mean change (SD) from baseline	.10 (9.64)	.65 (13.28)
TRIG mean (SD) at endline (T3)	18.27 (9.01)	19.22 (7.31)
Mean change (SD) from baseline	.52 (12.93)	.13 (10.36)
Mean change (SD) from medline	.42 (12.80)	-1.34 (11.64)

**Table 5: Multilevel modelling of SSQ N=96**

Independent variables	Unadjusted analysis			Multivariate analysis			
	Coef (95% CI)	Z	P value	Coef (95% CI)	Z	P value	
SSQ scores at baseline (in quartiles)	-.02 (-.35 to .31)	-0.12	.91	-.25 (-.65 to .15)	-1.23	0.22	
Intervention vs control	-.44 (-1.17 to .29)	-1.17	0.24	-.15 (-1.02 to .71)	-0.34	0.73	
Age							
£25 vs 26-35 years	.09 (-1.15 to 1.33)	0.14	0.89	.36 (-1.06 to 1.78)	0.49	0.62	
£25 vs 36-45 years		1.46	0.14		1.00	0.32	
£25 vs 46-55 years	.88 (-.30 to 2.07)	1.36	0.17	.73 (.70 to 2.17)	1.69	0.09	
£25 vs 56 years	.90 (-.39 to 2.20)	1.15	0.25	1.33 (-.21 to 2.86)	0.48	0.63	
Men vs women (ref male)	-.08 (-1.04 to .87)	-0.17	0.86	-	-	-	
Religion: Catholic vs Presbyterian	.84 (-.55 to 2.23)	1.18	0.24	.53 (-1.03 to 2.09)	0.67	0.50	
Catholic vs Apostolic	-.43 (-1.87 to 1.01)	-0.59	0.56	-.82 (-2.45 to .81)	-0.98	0.33	
Catholic vs Pentecostal	-.24 (-1.62 to 1.13)	-0.35	0.73	-.78 (-2.28 to .71)	-1.02	0.31	
Catholic vs Other	-1.31 (-2.89 to .27)	-1.62	0.11	-1.74 (-3.52 to 0.05)	-1.90	0.06	
Education: No education vs Primary	.13 (-1.65 to 1.91)	0.14	0.89	-	-	-	
No education vs Secondary	-.16 (-1.82 to 1.50)	-0.18	0.85	-	-	-	
No education vs Tertiary	-.25 (-2.26 to 1.76)	-0.24	0.81	-	-	-	
Employment: Not employed vs Formal employment	-1.04 (-2.23 to .15)	-1.71	0.09	-1.17 (-2.46 to .11)	-1.78	0.08	
Not employed vs Self-employment	-.53 (-1.37 to .30)	-1.26	0.20	-.49 (-1.45 to .47)	-1.01	0.32	
Not employed vs Farmer	-.05 (-1.43 to 1.32)	-0.08	0.94	-.44 (-2.15 to 1.28)	-0.50	0.62	
Number of bereaved people: 1 vs 2	.79 (-.15 to 1.73)	1.65	0.09	.32 (-.70 to 1.35)	0.62	0.54	
3	1 vs	1.72 (.54 to 2.90)	2.86	0.004*	2.22 (.87 to 3.58)	3.21	0.001*
4	1 vs	1.68 (.38 to 2.99)	2.53	0.011*	.91 (-.61 to 2.43)	1.17	0.24
5	1 vs	.22 (-1.13 to 1.57)	0.32	0.75	-.55 (-2.18 to 1.07)	-0.67	0.51

**Table 6: Multilevel modelling of MOS-SSS N=80**



Independent variables	Unadjusted analysis			Multivariate analysis		
	Coef (95% CI)	Z	P value	Coef (95% CI)	Z	P value
Social support scores at baseline (in quartiles)	-.09 (-.45 to .27)	-0.51	0.61	.13 (-.33 to .58)	0.54	0.59
Intervention vs control	.28 (-.46 to 1.02)	0.74	0.46	.27 (-.75 to 1.28)	0.51	0.61
Age						
£25 vs 26-35 years	1.06 (-.24 to 2.36)	1.60	0.11	2.04 (.40 to 3.67)	2.44	0.015*
£25 vs 36-45 years		1.54	0.12		2.81	0.005*
£25 vs 46-55 years	.97 (-.26 to 2.21)	0.20	0.84	2.43 (.74 to 4.12)	0.92	0.36
£25 vs 56 years	.14 (-1.18 to 1.45)	2.89	0.004*	.84 (-.94 to 2.61)	2.78	0.005*
	2.16 (.69 to 3.63)			3.43 (1.01 to 5.86)		
Men vs women (ref male)	-.51 (-1.48 to .46)	-1.03	0.30	-	-	-
Religion: Catholic vs Presbyterian	-.28 (-1.68 to 1.13)	-0.39	0.70	-1.19 (-3.04 to .66)	-1.26	0.21
Catholic vs Apostolic	-1.07 (-2.48 to .35)	-0.39	0.14	-.23 (-2.08 to 1.62)	-0.25	0.80
Catholic vs Pentecostal	-.53 (-1.87 to .81)	-0.77	0.44	-.36 (-2.16 to 1.45)	-0.39	0.70
Catholic vs Other	-.32 (-1.81 to 1.16)	-0.43	0.67	-.02 (-2.02 to 1.98)	-0.02	0.98
Education: No education vs Primary	-1.20 (-2.95 to .56)	-1.34	0.18	-.59 (-3.11 to 1.94)	-0.46	0.65
No education vs Secondary	-1.10 (-2.74 to .53)	-1.32	0.19	-.34 (-2.55 to 1.86)	-0.31	0.76
No education vs Tertiary	-.52 (-2.51 to 1.46)	-0.52	0.60	-.71 (-3.40 to 1.99)	-0.51	0.61
Employment: Not employed vs formal employment	1.27 (-.00 to 2.55)	1.96	0.05	1.72 (.23 to 3.21)	2.27	0.023*
Not employed vs Self-employment	.25 (-.59 to 1.08)	0.58	0.57	1.05 (-.05 to 2.16)	1.87	0.061
Not employed vs Farmer	.63 (-.87 to 2.13)	0.82	0.41	2.76 (.18 to 5.34)	2.09	0.036*
Number of bereaved people: 1 vs 2	1.05 (.12 to 1.98)	2.20	0.027*	1.68 (.44 to 2.93)	2.65	0.008*
1 vs 3	-.46 (-1.61 to .69)	-0.79	0.43	-1.16 (-2.78 to .46)	-1.39	0.16
1 vs 4	.09 (-1.24 to 1.42)	0.13	0.90	.12 (-1.56 to 1.79)	0.14	0.89
1 vs 5	-.13 (-1.61 to 1.35)	-0.17	0.87	-1.58 (-3.82 to .67)	-1.38	0.17

**Table 7: Multilevel modelling of TRIG N=98**

Independent variables	Univariate analysis			Multivariate analysis		
	Coef (95% CI)	Z	P value	Coef (95% CI)	Z	P value
TRIG scores at baseline (in quartiles)	-.070 (-.38 to .24)	-0.45	0.66	-.05 (-.37 to .26)	-0.33	0.74
Intervention vs control	.54 (-.17 to 1.26)	1.48	0.14	.43 (-.32 to 1.18)	1.11	0.27
Age						
25 vs 26-35 years	.09 (-1.22 to 1.32)	0.16	0.88	-	-	-
25 vs 36-45 years		-0.49	0.63	-	-	-
25 vs 46-55 years	-.28 (-1.43 to .86)	-0.64	0.52	-	-	-
25 vs 56 years	-.44 (-1.77 to .89)	-0.35	0.72	-	-	-
	-.23 (-1.51 to 1.05)					
Men vs women (ref male)	-.21 (-1.17 to .74)	-0.44	0.66	-	-	-
Religion: Catholic vs Presbyterian	.63 (-.68 to 1.94)	0.94	0.34	-	-	-
Catholic vs Apostolic	.26 (-1.07 to 1.58)	0.38	0.70	-	-	-
Catholic vs Pentecostal	.13 (-.113 to 1.40)	0.21	0.84	-	-	-
Catholic vs Other	.37 (-1.03 to 1.77)	0.52	0.60	-	-	-
Education: No education vs Primary	.69 (-.75 to 2.11)	0.95	0.34	-	-	-
No education vs Secondary	.06 (-1.20 to 1.31)	0.09	0.93	-	-	-
No education vs Tertiary	-.46 (-2.13 to 1.22)	-0.54	0.60	-	-	-
Employment: Not employed vs Normal employment	-.17 (-1.30 to .95)	-0.30	0.77	-.14 (-1.31 to 1.03)	-0.23	0.82
Not employed vs Self-employment	-.88 (-1.71 to -.06)	-2.11	0.035*	-.81 (-1.65 to .04)	-1.88	0.06
Not employed vs Farmer	-.76 (-2.18 to .65)	-1.06	0.29	-.71 (-2.22 to .80)	-0.92	0.36
Number of bereaved people: 1 vs	-.29 (-1.17 to .59)	-0.64	0.53	-.33 (-1.23 to .57)	-0.71	0.48
1 vs 3	-.32 (-1.50 to .86)	-0.53	0.60	-.34 (-1.56 to .88)	-0.55	0.58
1 vs 4	.21 (-1.07 to 1.50)	0.33	0.74	.36 (-.99 to 1.70)	0.52	0.61
1 vs 5	-1.09 (-2.38 to .20)	-1.65	0.09	-.79 (-2.16 to .58)	-1.13	0.26

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## Figures

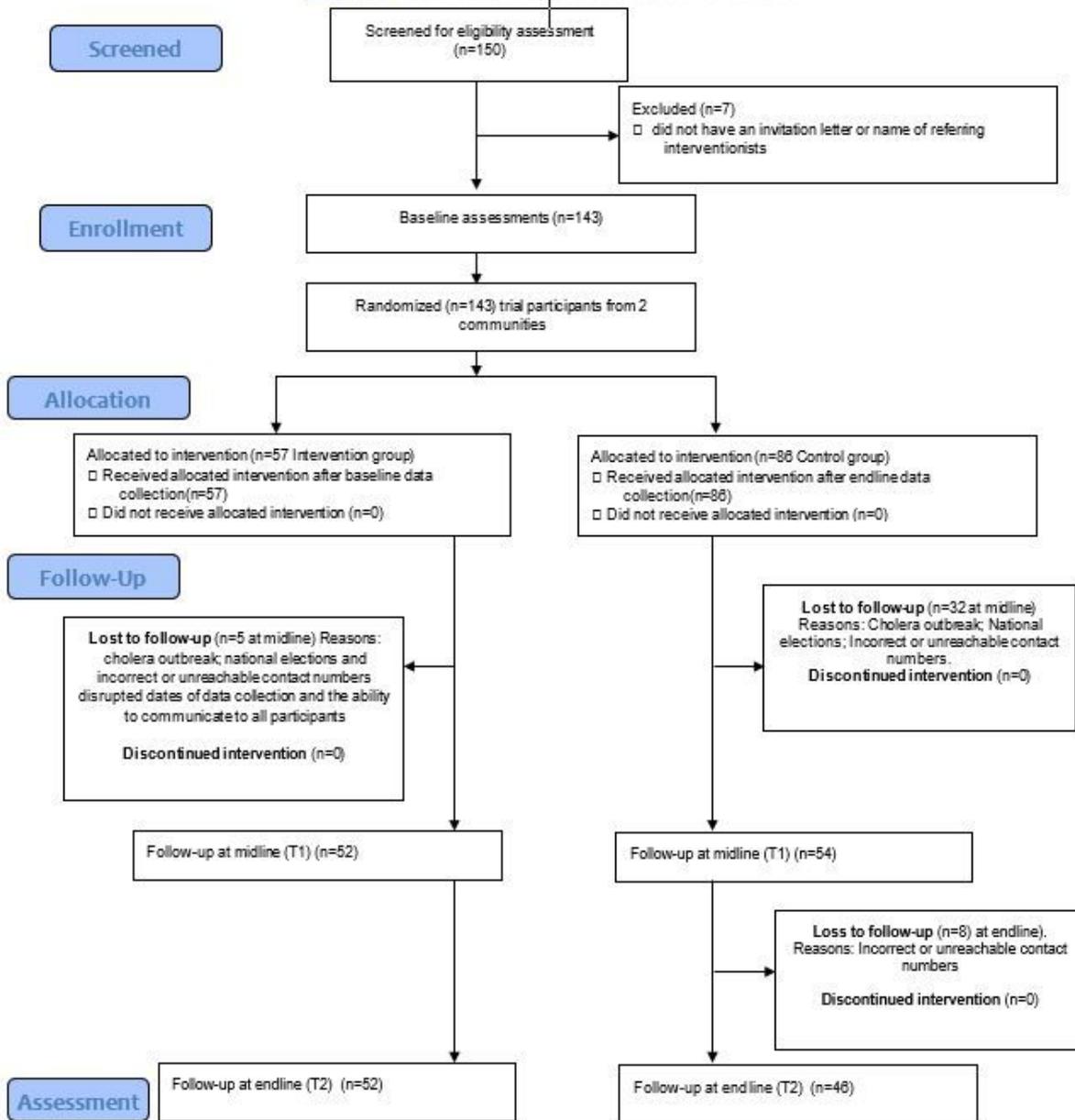
# Bereavement experiences

- Useful framework to explore individual, cultural and societal issues and responses in bereavement

	Cell number	1	2	3
Cell letter		Immediate	After several months	After a couple of years
A	Felt	A1	A2	A3
B	Shown	B1	B2	B3
C	Allowed/ Expected	C1	C2	C3

Figure 1

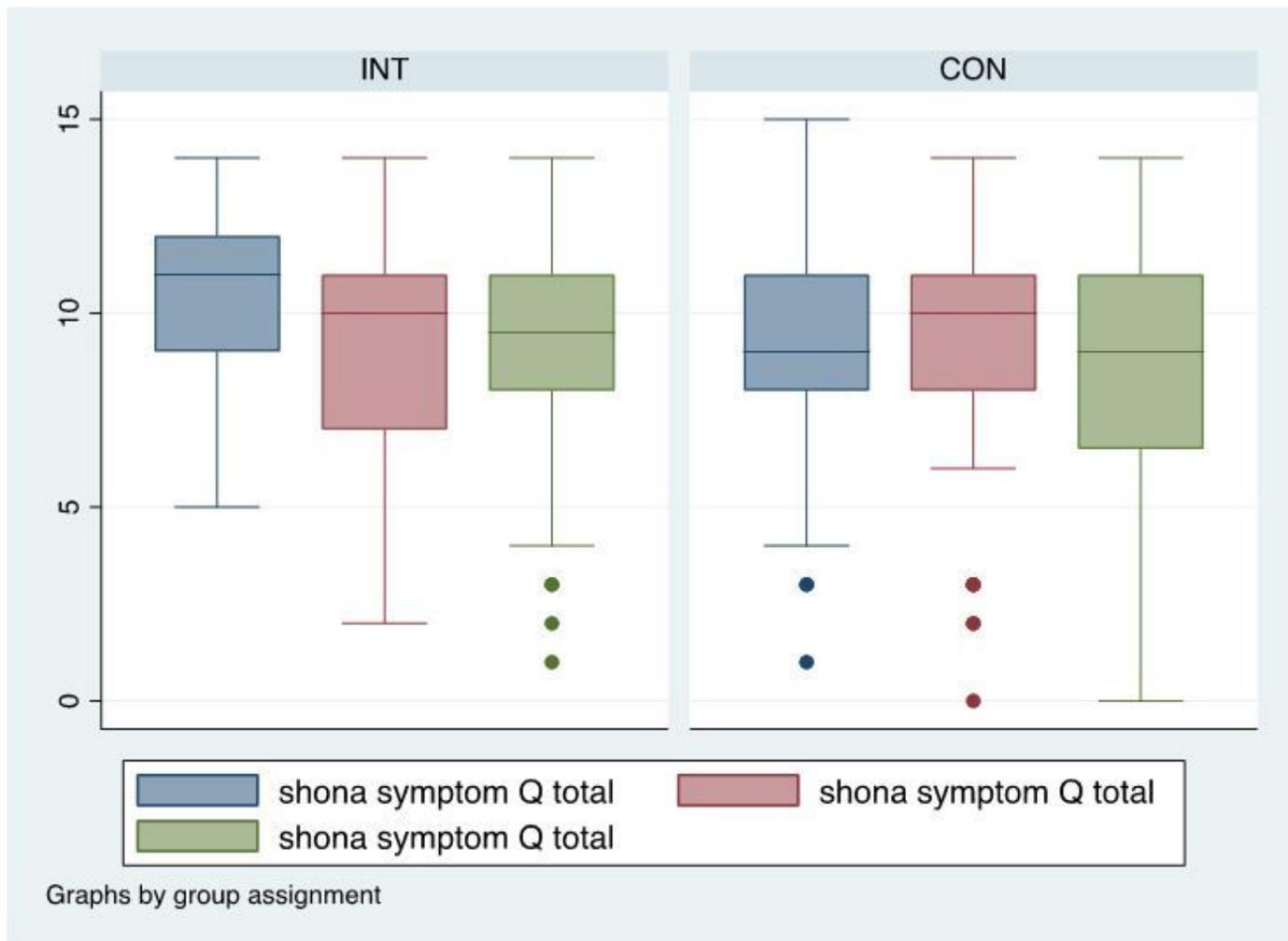
9 cell bereavement tool



Citation: Eldridge SM, Chan CL, Campbell MJ, Bond CM, Hopewell S, Thabane L, et al. CONSORT 2010 statement: extension to randomised pilot and feasibility trials. *BMJ*. 2016;355.

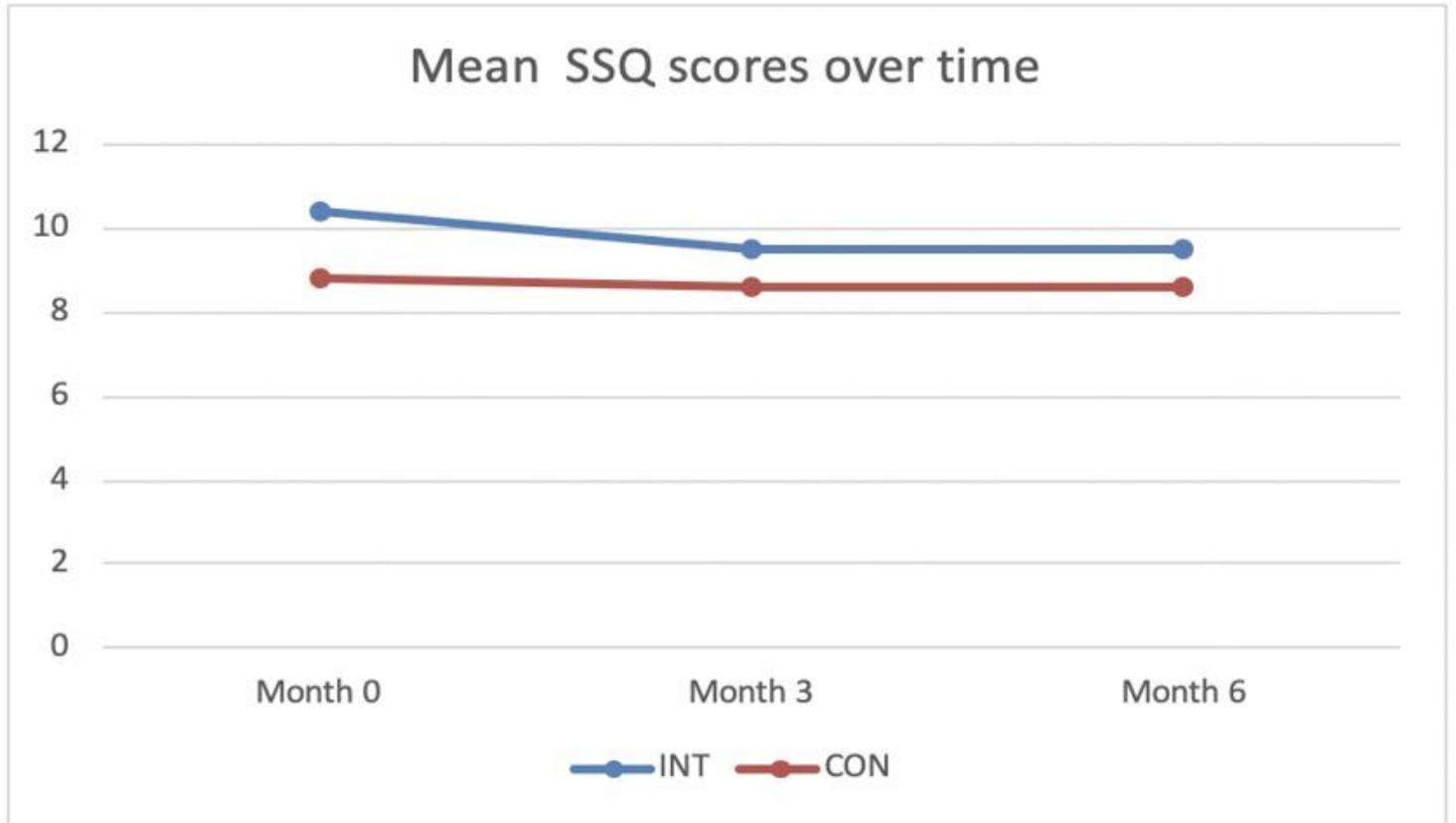
**Figure 2**

Flow diagram



**Figure 3**

Shona symptom Questionnaire, lower scores better outcomes



**Figure 4**

Shona symptom Questionnaire, lower scores better outcomes

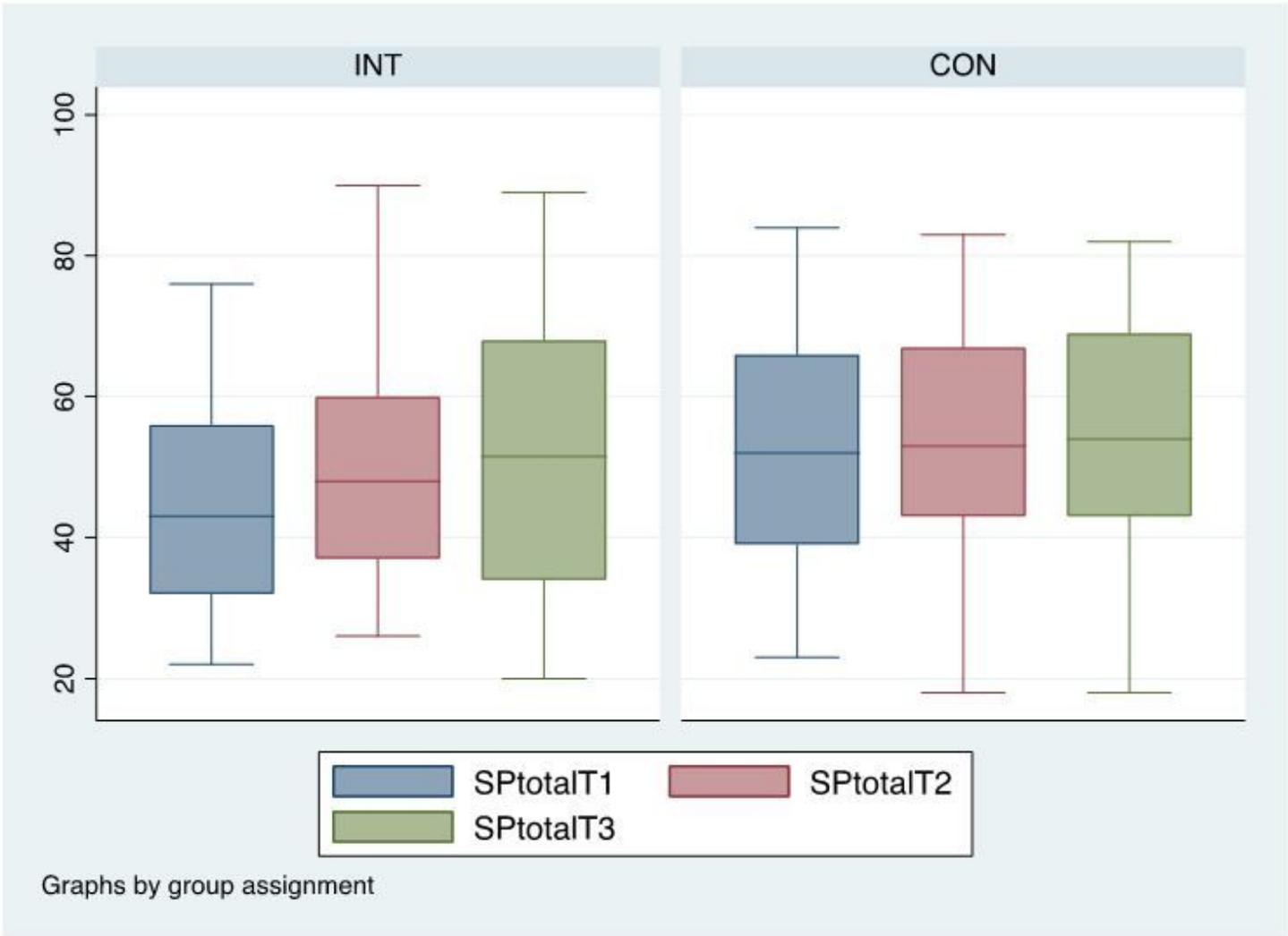
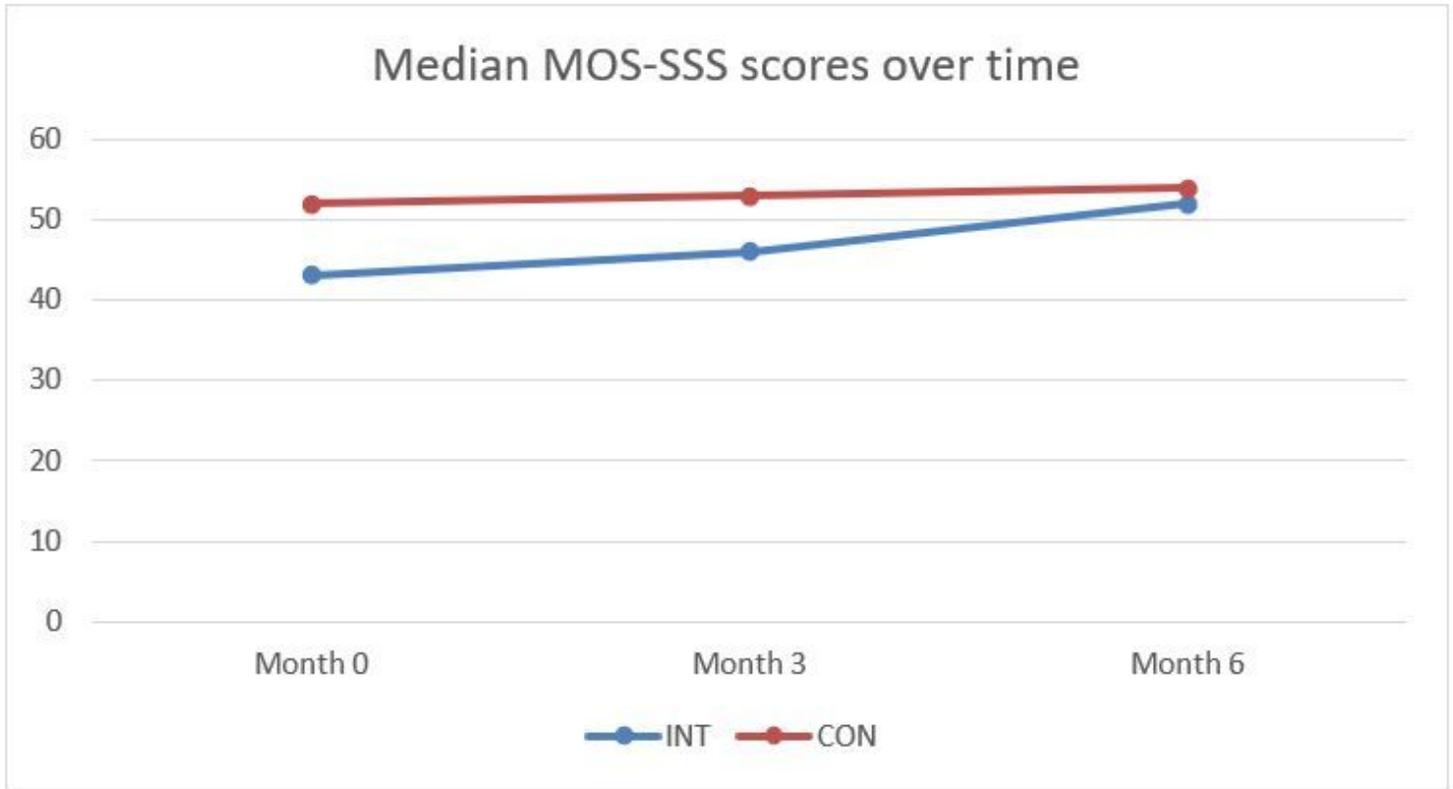


Figure 5

MOS-SSS (Medical Outcomes Study-Social Support Survey), higher scores better outcomes



**Figure 6**

MOS-SSS (Medical Outcomes Study-Social Support Survey), higher scores better outcomes

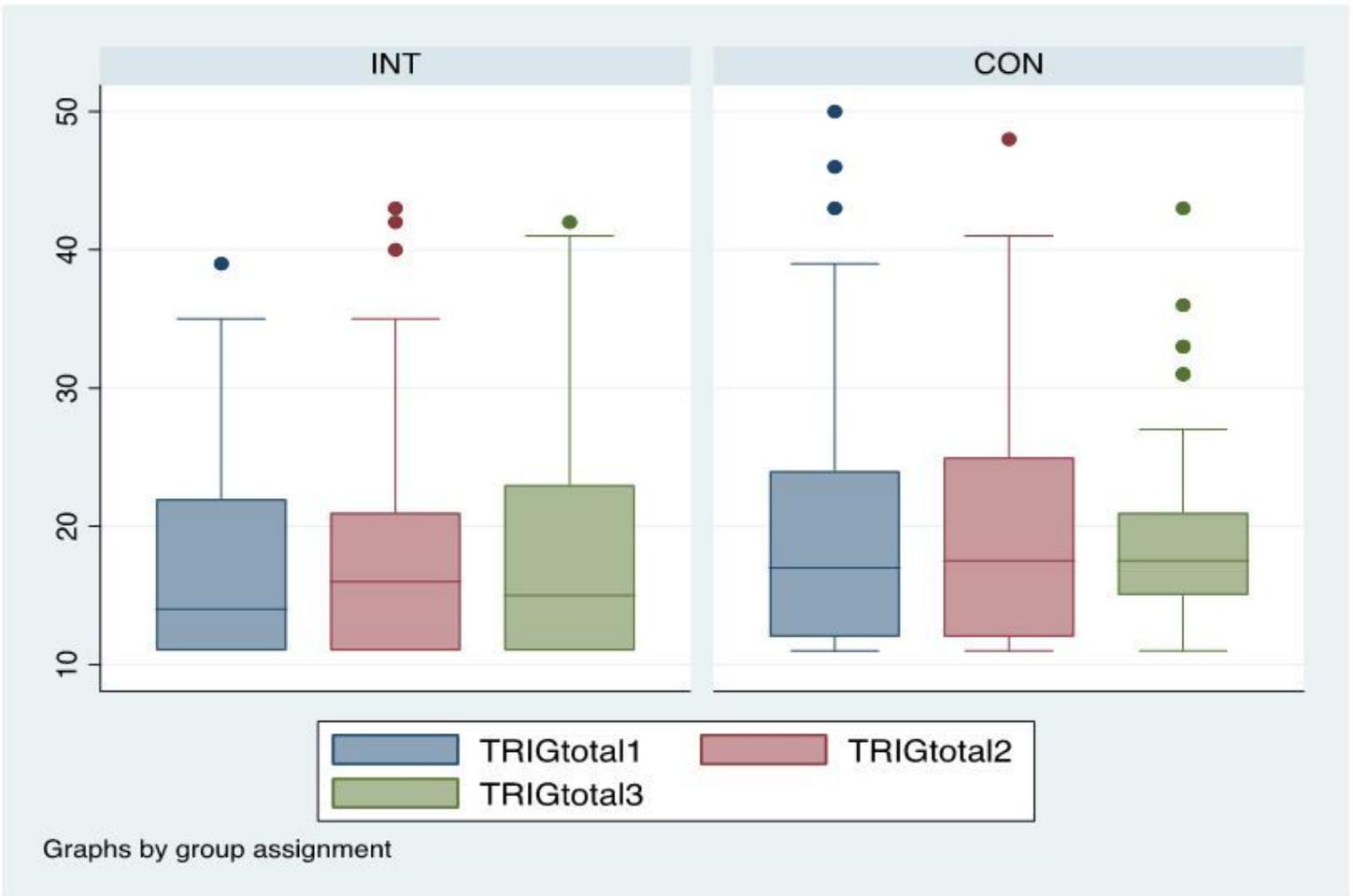
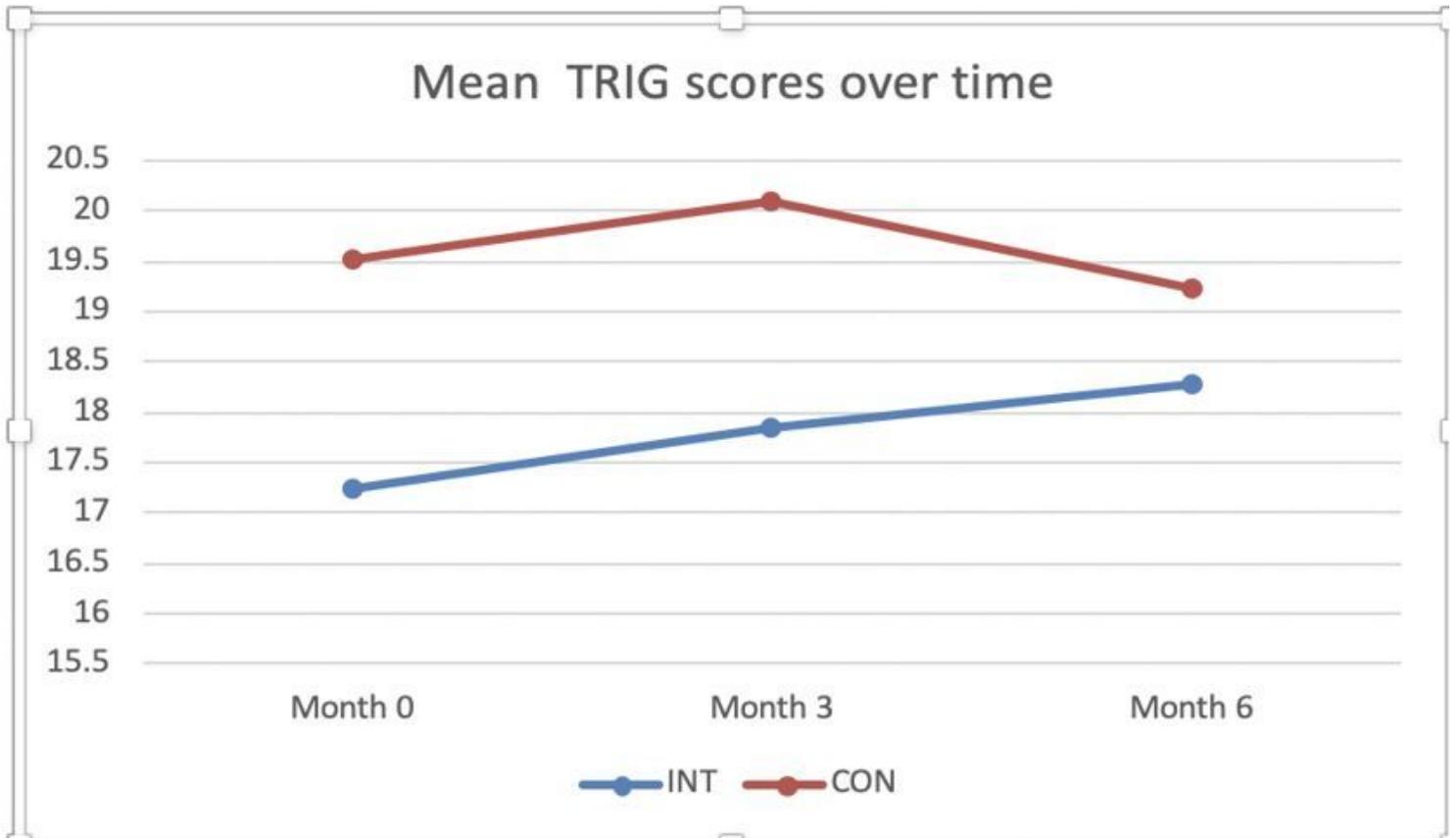


Figure 7

Texas Revised Inventory of Grief, higher scores better outcomes



**Figure 8**

Texas Revised Inventory of Grief, higher scores better outcomes

## Supplementary Files

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