An evaluation of Mind's resilience intervention for emergency workers

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Acknowledgments

I would like to express my enormous gratitude to the 430 emergency service personnel who took part in this evaluation and the Local Mind facilitators who expertly delivered the intervention. I would also like to express my gratitude to the staff at Local Minds and at National Mind and the University of Oxford who made this 11-month evaluation possible. In particular, I would like to thank Shama El-Salahi, Michelle Degli Esposti, Anke Ehlers, Libby Rackham, Juliane Sachshal, John Fresen, Alice Wallace, Joanna Moss, Shaun Goodwin, Ruth McConkey, Robyn Guillaume-Smith, Krithika Subramanian, Stuart Reid, Gavin Atkins, Faye McGuinness, and Jacob Diggle.

Abstract

Background: Emergency workers dedicate their lives to promoting public health and safety yet experience higher rates of mental ill health compared to the general population. Effective interventions to improve their resilience and wellbeing are urgently needed. Here we evaluate Mind's six session group-based resilience intervention in a randomised controlled trial.

Methods: Emergency workers (N=430) were randomly allocated on a 3:1 basis to receive Mind's six-session group-based resilience intervention or an online control intervention, which consisted of accessing six topics about mental health over six weeks. Participants completed a number of measures assessing resilience, wellbeing, coping and social capital at three assessment points: pre-intervention, post-intervention and three-month follow-up. Thirty-three participants form a natural wait-list group. They completed baseline questionnaires at two time points separated by 8 weeks prior to starting a course.

Results: There were no specific effects that could be linked to Mind's group-based intervention. That is, participants in both conditions showed similar, small rates of change over time. We calculated the reliable index of change for each outcome measure to identify the proportion of participants who reliably responded. The proportion of responders ranged from 8% to 30.1% depending on the outcome measure. The greatest proportion of responders (30.1%) showed improvements in wellbeing. However, the levels of improvements were similar to the waitlist, suggesting that improvements in wellbeing may be linked to the passage of time. There were no differences between the wait-list and the 8% to 23.9% who reported reliable improvements in resilience, coping, social capital and mental health outcomes, suggesting that the small improvements on these measures were linked to the interventions. All effect sizes were small, suggesting that the group-based intervention may not be cost effective in its current form. Participants who were likely to experience improvements were more likely to be more vulnerable at the outset with lower levels of resilience and wellbeing and higher levels of low mood at baseline compared to non-responders. A small proportion of participants showed reliable deteriorations from pre to post intervention in both conditions, which may be linked to factors other than the intervention. The majority of participants enjoyed the interventions, indicating a discrepancy between their experiences and measurable improvements in resilience, wellbeing, coping and social capital. Qualitative interviews with a random sample of participants and trainers indicated possible improvements for future courses.

Conclusions: The limited success of this intervention is consistent with the wider literature. Future refinements to the intervention may benefit from targeting predictors of resilience and mental ill health.

Introduction

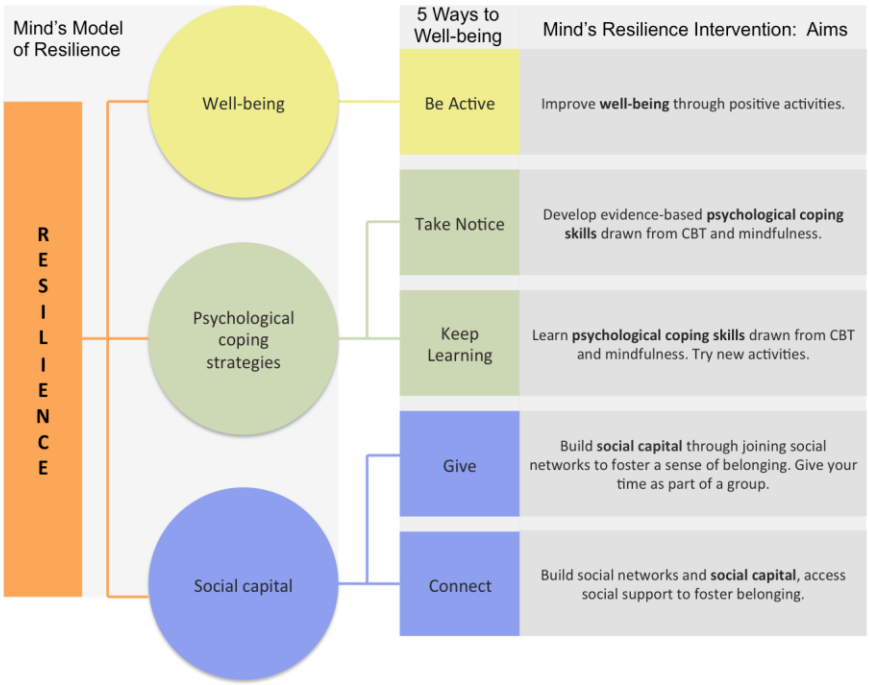
Some people can get over anything. They help someone in distress, are viciously attacked, yet pull through to devote even more hours as a paramedic helping to save other people's lives. They see daily violent crime in their job as a police officer and bounce back more committed to solving crime and protecting people. These people are resilient.

Resilience is what determines how people react to adversity, how it affects the outcomes of their lives. Resilience can be trained and with treatment, people can become more resilient (i.e., Connor & Davidson, 2003). Research suggests that resilient people are less likely to experience from mental health problems (e.g., Foresight, 2008).

Mind has developed a model of resilience and an intervention based on this model to improve the mental health resilience of at risk groups. The intervention has already demonstrated promising effects for pregnant women and new mothers at risk of social isolation, and unemployed men.

Another group at risk of developing mental health problems are emergency service workers who experience daily stressors and witness frequent trauma as part of their job. They dedicate their lives to improving public health yet experience higher rates of mental ill health compared to the general population. Can Mind's resilience intervention help this group?

Mind's model of resilience builds on the five ways to wellbeing, a set of evidence-based public mental health messages, identified by the New Economics Foundation, aimed at improving the mental health and wellbeing of the whole population. The diagram below illustrates how these five ways to wellbeing map onto Mind's resilience model and the aims of Mind's resilience intervention.



Mind's resilience programme contributes towards the achievement of Mind's visionary Unstoppable Together strategy (2012–2016), which includes supporting people who are at risk of mental health problems to build resilience and to stay well. A key aim of Mind's resilience intervention is to improve wellbeing. This is important as wellbeing predicts a broad range of general health outcomes including, for example, working days lost through illness five years later (Koivumaa-Honkanen et al., 2004), likelihood of stroke six years later and of cardio-vascular disease ten years later (Lyubomirsky et al., 2005).

The intervention also aims to improve social capital, the main aspects of which include fostering a sense of belonging in neighbourhoods and communities, and accessing social networks and support. Research has shown that higher levels of social capital are linked to better health, higher educational achievement, better employment outcomes, and lower crime rates (Office for National Statistics).

Finally, Mind's resilience intervention aims to develop psychological coping strategies drawn from evidence-based CBT and mindfulness interventions, an aspect that is of particular relevance to populations with high risk of exposure to stressful and potentially traumatic events. In a seminal study of ambulance workers, Clohessy and Ehlers (1999) demonstrated that particular psychological coping strategies were linked to lower levels of mental ill health. Shepherd and Wild (2013) demonstrated that particular types of thoughts following stressors were linked with better coping in paramedics.

A rigorous evaluation is essential to determine the effectiveness of the intervention prior to dissemination, inform improvements for future delivery, and isolate intervention-specific effects from effects linked to Mind's broader work available to emergency services.

Aims

Our evaluation aims to:

1. Establish the effectiveness of Mind's resilience intervention
2. Isolate the intervention-specific effects from Mind's broader work available to emergency service personnel
3. Link changes in key outcomes to specific course material to identify the most effective parts of the intervention for further development
4. Identify predictors of success to further develop the intervention for future delivery and to inform future training
5. Inform the development of evaluation tools for continued use by Local Minds

Methods

Design

Our evaluation is a randomized controlled trial in which participants (N=430) were randomly allocated in a 3:1 ratio to receive Mind's resilience intervention (N=317) or a control online intervention (N=113).

The resilience intervention consisted of six sessions (2.5 hours in length) normally delivered once per week over a six week period. The course aimed to improve

participants' wellbeing by building social capital, encouraging positive activities, and teaching psychological coping skills drawn from CBT and mindfulness.

The control online intervention consisted of accessing already available information on mental health developed by Mind and, where possible, tailored for emergency personnel. The online intervention was also normally delivered over six weeks and included six topics: sleep, stress, depression, anger, mindfulness, and post-traumatic stress disorder. A link for each topic was emailed to participants once per week. Participants completed the topics remotely. Appendix A shows PDF versions of the online topics.

Inclusion and Exclusion Criteria
The inclusion criteria included being employed or volunteering as front-line or office-based staff in one of the following emergency services: police, fire and rescue, ambulance and search and rescue.

Participants who scored in the clinical range on measures of post-traumatic stress or depression, or those who expressed suicidal ideation, had a one-to-one discussion with the study's psychologist. They were included in the study if they did not evidence risk, their symptoms were not interfering with their daily functioning and they did not wish to access treatment. Chart 1 shows the participant flow through the study and the percentage of people who scored for risk and the percentage of participants re-included into the study or signposted for further treatment.

Quantitative and Qualitative Components
The study included quantitative and qualitative measures to ascertain the effects of Mind's resilience intervention on outcome. The qualitative component of our study assessed staff and participant experience of the intervention, their thoughts on what worked as well as their thoughts on possible ways to improve the intervention.

Non-evaluated data
In line with Mind's values, we were able to offer the online mental health topics, which were part of the control condition, to participants who could not take part in the study. Participants accessed the information in the same format as participants within the study.

Natural Wait-List
We also assessed a 'natural wait list' group, which included participants (N=33) who completed baseline questionnaires at two time points separated by 8 weeks prior to starting a course. Comparisons to the natural wait-list group allow potential changes in resilience and wellbeing to be compared against natural fluctuations in these outcomes over time. It should be noted, however, that our wait-list sample was small and participants had not been randomly allocated to a wait period of 8 weeks. It just so happened that they could not start their group or online courses for 8 weeks after completing their baseline questionnaires and so completed another set of questionnaires at 8 weeks just prior to starting their courses.

Procedure

Recruitment
Between March and November 2015, we worked with Local Minds to invite participants to take part in the study. A total of N=670 participants completed their registration to take part in the resilience courses and were subsequently screened for depression, post-traumatic stress disorder and suicidal thoughts. A total of N=430 participants took part in the programme. A total of N=59 were signposted for

treatment and N=181 did not take their registration any further. Charts 1 to 2 show the participant flow through the study.

Stratification
All N=430 participants were randomized in a 3:1 ratio to receive the resilience intervention or the control intervention in four phases across nine sites in England. Random allocation was stratified by site and gender.

Number of courses
Within the timescale of the evaluation, Mind offered 31 six-week resilience courses from May to December 2015 and the control intervention was delivered at the same time. A total of N=279 participants received the active intervention and N=105 participants received the control intervention. On average, 9 participants (range 4-16) took part in each resilience group and 4 participants (range 1-10) took part in the control intervention, offered at the same time.

Questionnaires
Participants were asked to complete a number of measures via a secure digital programme at three distinct time-points: baseline (pre-intervention), post-intervention and at three-month follow-up. The questionnaires were short and took about 30 minutes to complete at baseline, and 20 minutes at post-intervention and follow-up. Participants also completed a brief tracking measure before the start of each group session or online topic.

In depth interviews
For the qualitative component of our evaluation, a random sample of staff and participants were invited for in-depth interviews at the end of phases one, two, three and four. In total, 12 participants in the resilience intervention, four participants in the control intervention, and eight course facilitators were interviewed.

Phase One
In phase one, the first cohort, N=55 participants were randomly allocated to receive the resilience intervention. A total of N=27 participants were randomly allocated to receive the control intervention.

Phase Two
In phase two, N=57 participants were randomly allocated to the resilience intervention and N=25 were randomly allocated to receive the control intervention.

Phase Three
In phase three, N=69 participants were randomly allocated to the resilience intervention and N=24 were randomly allocated to receive the control intervention.

Phase Four
In phase four, N=98 participants were randomly allocated to the resilience intervention and N=29 were randomly allocated to receive the control intervention.

Post-Intervention
Immediately after each intervention, we asked participants to complete post-intervention questionnaires: a total of N=256 participants in the resilience group and N=92 control participants completed questionnaires at this time-point.

Follow Up
We invited all 430 participants to complete three month follow-up questionnaires. A total of N=282 participants in the resilience group and N=100 control participants completed the questionnaires at this time-point.

Baseline and Outcome Measures

The following outcome measures were administered at pre-intervention, post-intervention and at follow-up:

Wellbeing

Warwick Edinburgh Mental Wellbeing scale (Tennant et al., 2007)
The Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS), developed by Warwick and Edinburgh Universities, is a scale of 14 positively worded items with five response categories for assessing mental wellbeing. The WEMWBS was administered in previous evaluations of Mind's resilience interventions. The total scores range from 14 to 70. The higher the score, the greater the wellbeing. The WEMWBS showed excellent reliability in our sample, Cronbach's alpha=0.94.

Resilience

Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003): This is a 25 item questionnaire. Each item carries a 5 point range of responses from 'not true at all' to 'true nearly all of the time'. The total scores range from 0-100 and provide a measure of resilience. The higher the score, the greater the resilience. The CD-RISC showed excellent reliability in our sample, Cronbach's alpha=0.931.

Self-efficacy

Schwarzer-Jerusalem General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem,1995)
The General Self-Efficacy Scale is a 10-item scale that is designed to assess optimistic self-beliefs to cope with a variety of difficult demands in life. In contrast to other scales that have been designed to assess optimism, this one explicitly refers to personal agency, i.e., the belief that one's actions are responsible for successful outcomes. The GSE was administered in previous evaluations of Mind's resilience interventions. The total scores range from 10 to 40. Higher scores represent greater self-efficacy. The GSE showed good internal reliability in our sample, Cronbach's alpha=0.894

Ability to Problem-Solve and Achieve Goals. This is an unpublished questionnaire used in previous evaluations of Mind's resilience intervention, which consists of 8 items to assess a person's perception of how well they feel they can solve problems and achieve goals. It also taps self-efficacy. Total scores range from 8 to 32. Higher scores represent greater ability to problem solve and reach goals. This questionnaire showed excellent internal reliability in our sample, Cronbach's alpha=0.903.

Social Capital

Social Participation (Alden & Taylor, 2011). This is a 13-item questionnaire that assesses an individual's social participation. Example items include: In the past month, did you: 'Share your opinions and ideas with others?', 'Talk about meaningful personal experiences with others?', 'Attend work-or school-related social events?'. Participants rate how often they have actively participated in such activities in the last month on a 7-point scale ranging from 1=Not at all to 7=Often. Total scores range from 13 to 91. Higher scores represent greater desire to be social and participate in social situations. This questionnaire showed excellent internal reliability in our sample, Cronbach's alpha=0.919.

Social Support (Adapted version of Sarason et al., 1987): This questionnaire has 13 items, which assess perceived support from and closeness to friends, family and work colleagues. This questionnaire taps the sense of belonging and use of social support linked to social capital. Items include 'Whenever you want to talk how often is there someone willing to listen?' 'Do you feel a sense of comradeship (or closeness) between yourself and people you work with?' The first 6 items relate to support from friends and family. Items 7 to 13 assess perceived support at work. Item 13 is reverse scored. Responses are rated on a 7-point scale from 1=Never to 7=Always. Total scores for Social Support (Home) range from 6 to 42. Total scores for Social Support (Work) range from 14 to 49. This questionnaire showed good internal reliability in our sample: social support (Home) Cronbach's alpha=0.766 and social support (Work), Cronbach's alpha=0.832.

Psychological Coping Styles

Confidence in managing mental health and resilience (unpublished). This is a one-item questionnaire designed specifically for this study in which participants rate the degree to which they feel confident in managing their mental health and improving their resilience. Responses are rated on a 7-point scale from 1=Totally disagree to 7=Totally Agree. Higher scores reflect greater confidence in managing mental health. Total scores range from 1 to 7.

Attributions Questionnaire (Kleim et al., 2008): This questionnaire assesses attributions of negative events. The scale has 11 items that measure negative stable attributions (e.g., *'When bad things happened to me, I was sure it would happen again'),* negative internal attributions (e.g.,' *When bad things happened, I thought it was my fault'),* and negative global attributions (e.g., *'When bad things happened to me, I couldn't see anything positive in my life')* and helplessness (e.g., '*When things did not go well, I got easily discouraged').* Responses are rated on a 4-point scale from 1=Not at all true to 7=Exactly true. Total scores range from 11 to 44. Higher scores represent more negative attributions. This questionnaire showed excellent internal reliability in our sample, Cronbach's alpha=0.93.

Coping Behaviour Questionnaire (short version, Carver, Scheier, & Weintraub, 1989): This questionnaire is a shorter version of the well-known COPE questionnaire and assesses coping behaviour. It consists of 19 items. Participants rate what they do in very stressful situations, such as 'I concentrate my efforts on doing something about the situation I am in' on a scale of 1=Not at all to 4=A lot. The questionnaire taps 9 factors linked to coping. Each scale has two items with total scores for each factor ranging from 2 to 8. We added a factor called wishful thinking, which has been shown to correlate with severe stress in paramedics. This scale has three items, with total scores ranging from 3 to 12. Higher scores represent greater use of the particular coping strategy. Internal reliability for each scale ranged from adequate to excellent: self-distraction, Cronbach's alpha= 0.53; active coping, Cronbach's alpha=0.75; denial, Cronbach's alpha=0.64; substance use, Cronbach's alpha=0.89; use of emotional support, Cronbach's alpha=0.78; self-blame, Cronbach's alpha=0.77; behavioural disengagement, Cronbach's alpha=0.65; acceptance, Cronbach's alpha= 0.57 and wishful thinking, Cronbach's alpha=0.76.

The Ruminative Responses Scale (RRS; Treynor et al., 2003). This 22-item scale measures the frequency of engaging in dwelling, circular negative thinking. Items are rated on a scale of 1=Almost never to 4=Almost always. Total scores range from 22 to 88. Higher scores reflect greater engagement in rumination. Internal reliability of the scale in our sample was excellent, Cronbach's alpha=0.95.

The Responses to Intrusions Questionnaire (RIQ; Clohessy & Ehlers, 1999): Intrusive memories are commonly experienced by emergency service personnel both by frontline and office-based staff. The RIQ measures maladaptive responses to intrusive memories and includes suppression, rumination, and numbing. The questionnaire consists of 19 items, which are rated on a scale of 0=Never to 4=Always. Total scores for the Suppression subscale range from 0 to 32. Total scores for the Rumination subscale range from 0 to 24 and total scores for the numbing subscale range from 0 to 20. Internal reliability for each scale was good: suppression, Cronbach's alpha=0.84; rumination, Cronbach's alpha=0.90, and numbing, Cronbach's alpha=0.74.

We administered the following outcome measure at pre-intervention and at follow-up only:

Days off work (unpublished). This is a brief questionnaire, which asked how many days off work an individual had in the past three months due to illness and how many days off due to stress. The scores were summed to give a total score and divided by number of weeks to give the total number of days off work per week.

Tracking Measure

The following weekly measure was administered before each group meeting or online topic was completed:

Mood, Coping and Wellbeing (unpublished). The tracking measure included a brief version of the wellbeing scale (WEMWBS), the 10-item version of the resilience scale (CD-RISC) and a measure of depression (PHQ-9). Participants also indicated whether or not they had experienced a critical incident in the previous week.

Clinical Measures

The following screening measures were assessed at pre-intervention, post-intervention and at follow-up.

Trauma Screener (unpublished): This is a 21-item questionnaire looking at exposure to previous trauma relevant to the emergency services and includes items from the Clinician Administered PTSD Scale (CAPS, Blake et al., 1998). Participants select 'yes' or 'no' to indicate whether or not they have experienced the trauma. Total scores range from 0 to 21.

Post-traumatic Stress Disorder Checklist (PCL; Weathers et al., 2013): The PCL-5 consists of 20 items that parallel the diagnostic criteria for PTSD set out in the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-V; American Psychiatric Association, 2013). Items are rated on a scale of 0=Not at all to 4=Extremely. Total scores range from 0 to 84. Internal reliability of the scale in our sample was excellent, Cronbach's alpha=0.95.

Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001): This is a well validated 9-item measure to assess symptoms of depression. Items are rated on a scale of 0=Not at all to 3=Nearly every day. Total scores range from 0 to 27. Internal reliability of the scale in our sample was good, Cronbach's alpha=0.86.

General Anxiety Disorder Scale (Spitzer et al., 2006). This is a 7-item well validated measure of anxiety. High scores are suggestive of an anxiety problem. Items are rated on a scale of 0=Not at all to 3=Nearly every day. Total scores range from 0 to 21. Internal reliability of the scale in our sample was good, Cronbach's alpha=0.88.

The Alcohol Use Disorders Identification Test (Babor et al., 2011): This 10-item questionnaire was developed by the World Health Organisation to measure a person's weekly intake of alcohol and substances. It also assesses whether a person's use of alcohol or street drugs has caused problems for them. Items are rated on a scale of 0=Never to 4=Daily or almost daily. Total scores range from 0 to 40. Internal reliability of the scale in our sample was good, Cronbach's alpha=0.74.

Demographic and Personality Measures

The following measures will be assessed at pre-intervention only.

General Information Questionnaire (unpublished): This questionnaire records demographic information, such as age, gender, marital status, years of education, qualifications, and annual income.

Eysenck Personality Questionnaire, Neuroticisim Subscale (EPQ; Eysenck & Eysenck, 1975). The neuroticism subscale has 12 items, which assess emotionality. Items are rated on a scale of 0=No to 1=Yes. Total scores range from 0 to 12. Internal reliability of the scale in our sample was excellent, Cronbach's alpha=0.84.

Hypotheses

We hypothesised that the group-based resilience intervention would lead to greater improvements in resilience, wellbeing, social capital, self-efficacy, problem solving ability, and confidence in managing mental health than the online control intervention. We hypothesised that the group-based resilience intervention would lead to reductions in maladaptive coping behaviours, depressive attributions and rumination.

Analyses

To investigate the effects of the interventions on outcome, we conducted mixed model analysis of variance (ANOVA) with condition (group-based, online) as the between-subjects factor and time (pre-intervention, post-intervention, follow-up) as the repeated measures factor. We calculated the intervention effect sizes for changes in outcome using Cohen's d statistic (Cohen, 1988): $d = M_{initial} - M_{post} / SD_{pooled}$, with $SD_{pooled} = SQRT((SD^2_{initial} + SD^2_{post})/2$ where d=0.20 represents a small effect, d=0.50 represents a medium effect and d=.80 represents a large effect. Where there was a significant effect of time, we then calculated the reliable change index associated with the outcome measure using the recommended formula: reliable change index (RCI)=1.96 x (SD1x$\sqrt{2}$x$\sqrt{1-r}$) where r=reliability coefficient for the measure (Evans et al.,1998). We then determined the proportion of reliable responders, non-responders and participants who reliably deteriorated. We conducted one-way ANOVA to compare differences in baseline measures between participants who reliably responded, participants who did not respond and participants who reliably deteriorated with the interventions. To investigate potential changes in outcome associated with the wait-list condition, we conducted paired-samples t-tests. We employed Bonferonni correction to correct for multiple testing.

Chart 1: Participant Flow through the Study

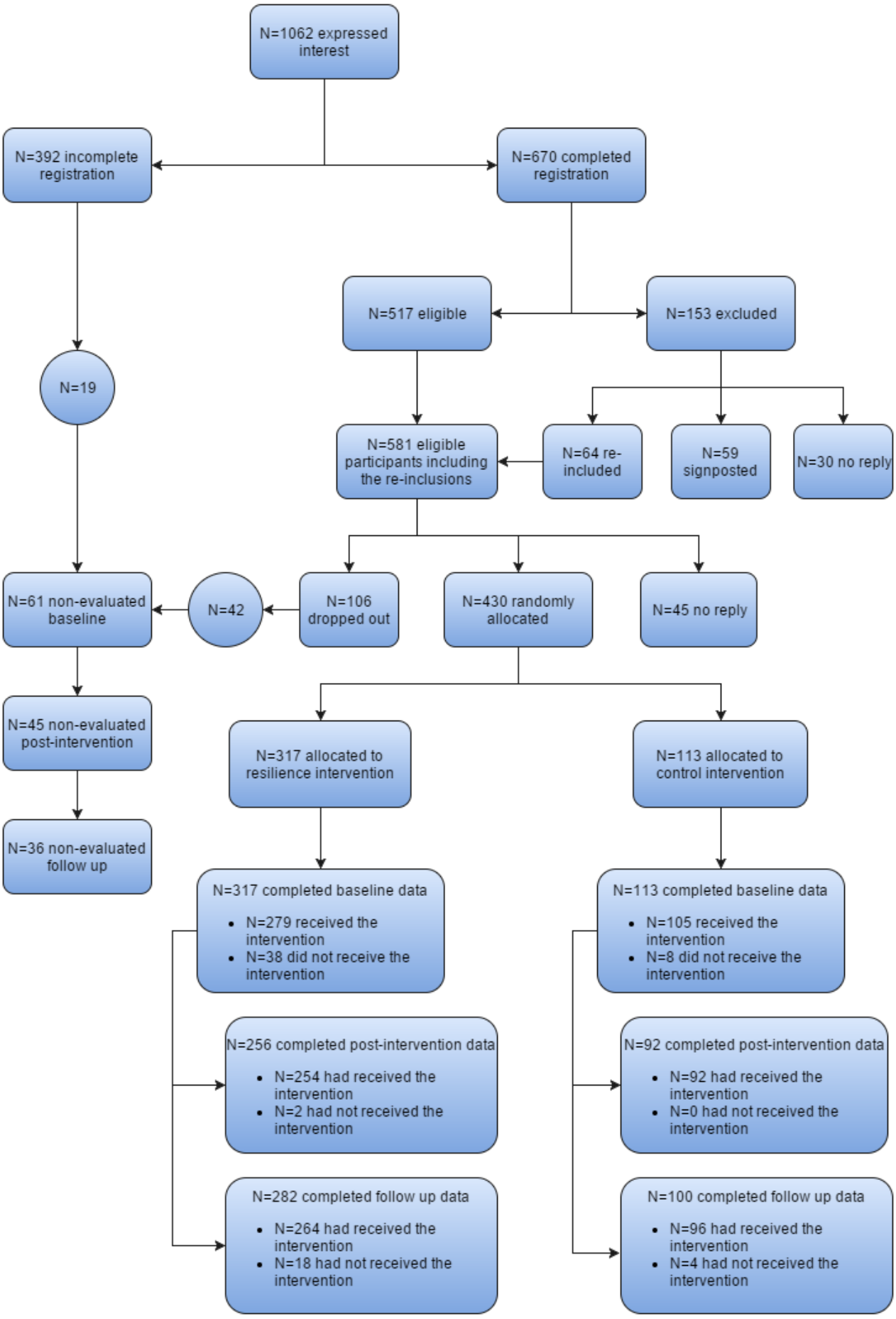
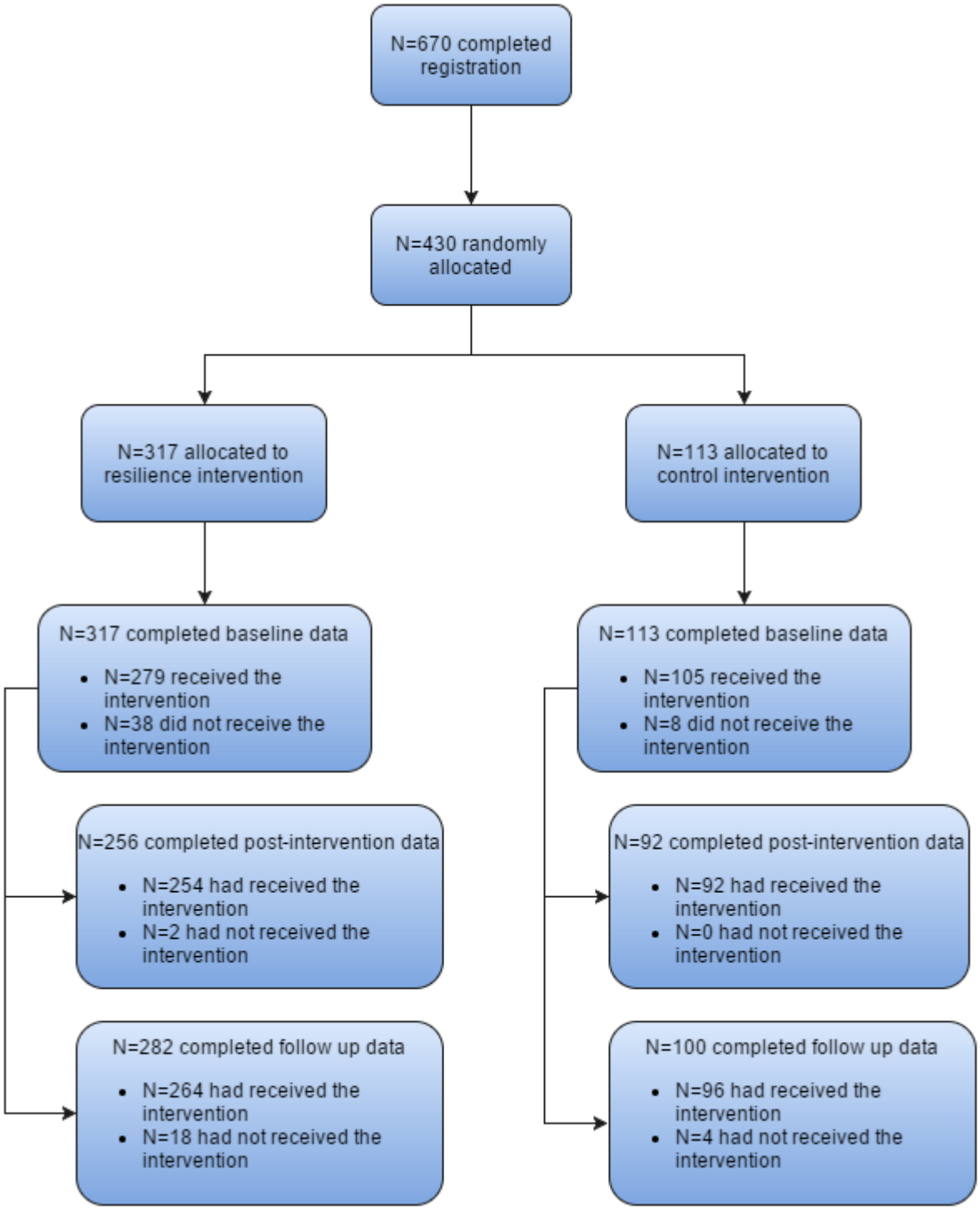


Chart 2: Participant Flow through the RCT



Results

Tables 1 and 2 show the demographic data for (1) all participants and (2) participants in each condition. Table 3 shows the means and standard deviations of the outcome measures at each assessment point (baseline, post-intervention and follow-up).

Table 1: Baseline demographics for all participants

	N	Mean	SD
Age	430	41.41	9.78
Previous Traumas	430	4.57	3.41
PTSD (PCL-5)	421	9.09	12.74
Depression (PHQ-9)	430	3.87	4.01
Alcohol Use (AUDIT)	421	5.22	4.12
Resilience (CD-RISC)	420	66.75	14.68
Wellbeing (WEMWBS)	421	48.55	8.96
Self-efficacy (GSE)	421	31.14	4.23
No. of Years in Education	368	15.26	6.15
		N	%
Service: Police		225	52.3
Ambulance		120	27.9
Fire		68	15.8
Search & rescue		17	4.0
Marital Status: Single		76	17.7
Married		215	50.0
Divorced/separated		44	10.2
Widowed		3	.7
Civil partnership		5	1.2
Long-term partner		87	20.2
Gender: Female		250	58.1
Male		180	41.9
Education Level: No qualification		3	.7
GCSE		69	16.0
A Level		117	27.2
Degree/Other		190	44.2
Masters		43	10.0
PhD		8	1.9
Ethnicity: White British		384	89.7
White Irish		10	2.3
Eastern European		2	0.5
Other White Background		8	1.9
Caribbean		4	0.9
Indian		7	1.6
Pakistani		2	0.5
Another Asian Background		1	0.2
White & Asian		2	0.5
White & Black Caribbean		2	0.5
Other Mixed Background		1	0.2
Arab		1	0.2
Other Background		4	0.9

Table 2: Baseline demographic data for participants in each condition

	Group		Online	
	Mean	SD	Mean	SD
Age	41.09	9.98	42.32	9.20
Previous Traumas	4.498	3.45	4.76	3.28
PTSD (PCL-5)	8.965	12.37	9.42	13.75
Depression (PHQ-9)	3.89	4.07	3.83	3.85
Alcohol Use (AUDIT)	5.23	4.08	5.19	4.25
Resilience (CD-RISC)	66.49	14.72	67.48	14.62
Wellbeing (WEMWBS)	48.57	8.89	48.49	9.17
Self-efficacy (GSE)	30.94	4.22	31.69	4.22
No. of Years in Education	15.39	6.44	14.86	5.25
	N	%	N	%
Service: Police	170	53.6	55	48.7
Ambulance	89	28.1	31	27.4
Fire	47	14.8	21	18.6
Search & rescue	11	3.5	6	5.3
Marital Status: Single	57	18.0	19	16.8
Married	164	51.7	51	45.1
Divorced/separated	30	9.5	14	12.4
Widowed	3	.9	-	-
Civil partnership	3	.9	2	1.8
Long-term partner	60	18.9	27	23.9
Gender: Female	186	58.7	64	56.6
Male	131	41.3	49	43.4
Education Level: No qualification	2	.6	1	.9
GCSE	56	17.7	13	11.5
A Level	82	25.9	35	31.0
Degree/Other	140	44.2	50	44.2
Masters	33	10.4	10	8.8
PhD	4	1.3	4	3.5
Ethnicity: White British	254	91.0	93	91.2
White Irish	8	2.9	2	2.0
Eastern European	0	0	1	1.0
Other White Background	5	1.8	2	2.0
Caribbean	2	0.7	1	1.0
Indian	4	1.4	1	1.0
Pakistani	0	0	0	0
Another Asian Background	0	0	0	0
White & Asian	1	0.4	0	0
White & Black Caribbean	2	0.7	0	0
Other Mixed Background	1	0.4	0	0
Arab	1	0.4	0	0
Other Background	1	0.4	2	2.0

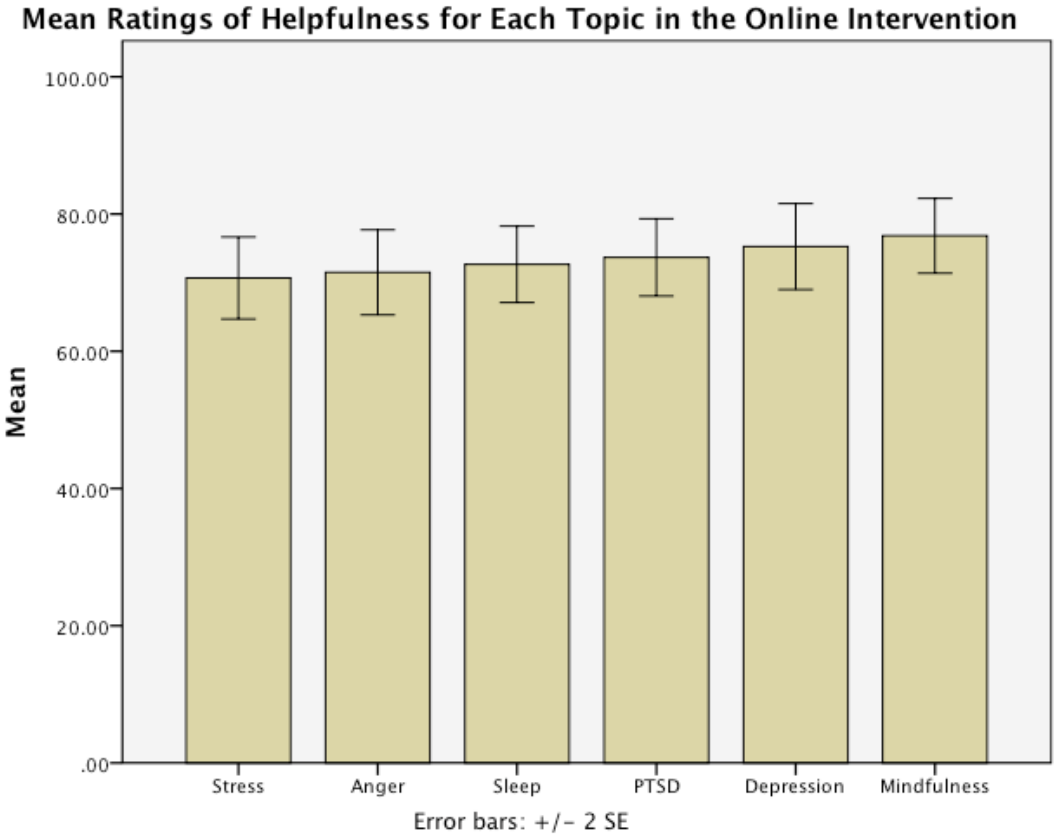
Table 3: Means and Standard Deviations of outcome measures at baseline, post-intervention and follow-up

Measure	Group Intervention			Online Control Intervention		
	Pre	Post	Follow-up	Pre	Post	Follow-up
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Resilience (CD-RISC)	66.20 (15.05)	67.90 (17.03)	68.67 (16.17)	68.04 (14.89)	68.48 (15.26)	70.23 (14.69)
Wellbeing (WEMWBS)	48.39 (8.89)	50.70 (9.37)	50.56 (9.02)	48.74 (9.20)	51.28 (9.93)	50.88 (9.43)
Self-Efficacy (GSE)	30.90 (4.29)	31.74 (4.49)	31.96 (4.56)	31.86 (4.12)	31.91 (4.74)	32.52 (4.30)
Problem Solving	22.98 (4.80)	23.98 (4.55)	24.27 (4.77)	23.51 (4.95)	24.41 (4.73)	24.51 (5.15)
Coping Behaviour						
Self-distraction	4.69 (1.52)	4.76 (1.54)	4.50 (1.53)	4.84 (1.59)	4.51 (1.56)	4.66 (1.59)
Active Coping	5.39 (1.56)	5.45 (1.53)	5.37 (1.55)	5.57 (1.46)	5.38 (1.56)	5.66 (1.57)
Acceptance	5.72 (1.49)	5.64 (1.56)	5.76 (1.58)	6.03 (1.61)	5.85 (1.63)	5.88 (1.54)
Denial	2.48 (1.02)	2.57 (1.07)	2.50 (1.01)	2.53 (0.90)	2.52 (0.78)	2.33 (0.79)
Substance Use	2.57 (1.18)	2.45 (1.07)	2.50 (1.13)	2.52 (0.97)	2.57 (1.26)	2.47 (1.05)
Emotional Support	4.49 (1.58)	4.61 (1.58)	4.51 (1.60)	4.72 (1.71)	4.55 (1.63)	4.47 (1.71)
Behavioural Disengagement	2.71 (1.06)	2.75 (1.19)	2.79 (1.14)	2.77 (1.27)	2.68 (1.20)	2.62 (1.03)
Self-Blame	4.09 (1.63)	3.98 (1.62)	3.74 (1.52)	4.25 (1.87)	4.04 (1.72)	3.88 (1.78)
Wishful Thinking	6.43 (2.42)	6.10 (2.20)	5.95 (2.32)	6.96 (2.82)	6.34 (2.47)	6.03 (2.59)
Social Participation	58.84 (15.63)	62.38 (17.87)	61.64 (16.89)	57.37 (16.87)	60.63 (17.90)	60.00 (18.59)
Social Support (Home)	33.04 (5.99)	33.63 (6.44)	34.17 (6.51)	32.76 (6.95)	32.83 (7.09)	33.28 (7.80)
Social Support (Work)	27.15 (6.58)	27.20 (6.59)	27.67 (6.60)	26.76 (6.73)	27.14 (7.16)	26.79 (7.08)
Rumination (RRS)	40.43 (13.22)	39.19 (12.79)	38.39 (14.01)	40.63 (14.15)	40.50 (14.77)	38.34 (14.18)
Response to Intrusive Memories						
Suppression	8.46 (3.56)	8.84 (3.28)	8.54 (3.77)	9.57 (3.94)	9.04 (3.88)	8.61 (3.56)
Rumination	7.52 (5.48)	6.93 (4.99)	6.64 (5.57)	7.07 (5.42)	7.08 (5.63)	6.69 (5.62)
Numbing	3.28 (2.83)	3.36 (2.67)	3.18 (2.90)	3.40 (2.67)	3.40 (2.66)	3.14 (2.40)
Depressive Attributions (DAQ)	21.98 (8.35)	20.62 (7.75)	20.78 (8.84)	23.03 (8.85)	22.73 (9.93)	20.79 (7.90)
Neuroticism (EPQ)	5.32 (3.37)	5.19 (3.31)	4.96 (3.46)	4.81 (3.41)	4.88 (3.51)	4.69 (3.12)
PTSD (PCL-5)	8.84 (12.47)	7.44 (10.46)	6.90 (11.37)	9.77 (14.21)	9.12 (13.56)	9.04 (14.74)
Alcohol Use (AUDIT)	5.22 (4.05)	4.82 (3.71)	4.78 (4.02)	5.27 (4.25)	5.20 (4.54)	4.97 (4.00)
Depression (PHQ-9)	3.79 (3.93)	3.48 (3.18)	3.17 (3.61)	3.85 (3.95)	3.81 (4.42)	3.41 (4.08)
Anxiety (GAD-7)	3.13 (3.53)	3.15 (3.08)	2.83 (3.32)	3.39 (3.74)	3.27 (3.43)	3.02 (3.76)
Average # days off / week	0.24 (0.95)	0.24 (0.93)	0.34 (1.37)	0.29 (1.03)	0.24 (0.80)	0.45 (1.30)
Confidence mental health (CMH)	5.02 (1.32)	5.42 (1.19)	5.41 (1.30)	5.04 (1.41)	5.42 (1.21)	5.49 (1.32)

Demographics
There were no significant differences on any of the demographic (age, previous trauma, number of years of education, service, marital status, gender, qualifications, ethnicity) and baseline measures between participants receiving the group or online conditions.

Attendance to Sessions/ Topics completed
Participants in the resilience group completed a mean number of 4.67 sessions (SD=1.43) sessions. Participants in the online condition completed a mean number of 5.21 (SD=1.38) topics. Participants in the online condition completed significantly more topics than sessions completed by participants in the group condition, F(1,380)=10.63, p=0.001.

Online Intervention
How helpful were the topics?
After completing each topic online, participants were asked to rate out of 100% how helpful they found the topic. The highest mean helpfulness rating was 76.61 (SD=22.79) for the topic on Mindfulness and the lowest mean rating was 68.96 (SD=24.51) for the topic on Stress. Mindfulness, Depression and PTSD received the highest ratings. Chart 3 shows the mean ratings for each topic.



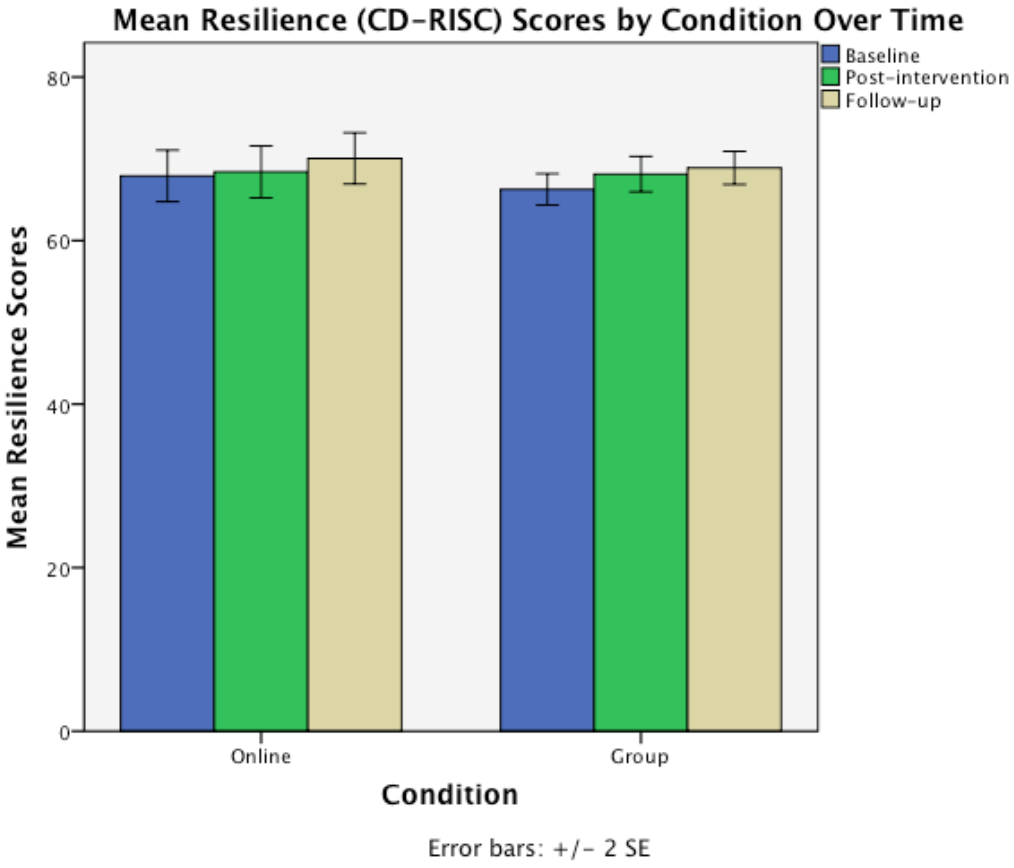
Group Intervention
Adherence to protocol
Thirty audio-recordings of group sessions were randomly selected from the 31 courses that were offered from May to December 2015. Ten per cent of these audio-recordings were double-rated for inter-rater reliability, which yielded a correlation coefficient of r=0.985, suggesting excellent inter-rater reliability. Adherence to protocol ratings out of 100% ranged from 60 to 100, with a mean rating of 85.65 (SD=13.07), suggesting that the Local Mind

trainers demonstrated good adherence to protocol for delivering the group-based intervention.

Resilience

A repeated measures ANOVA with three levels (baseline, post-intervention and follow-up) revealed there were no significant differences in levels of resilience between the resilience and control groups, F(2, 668)=0.42, p=0.665. Participants in the resilience and control conditions did not differ significantly in their rates of change on the measure of resilience. There was a significant main effect of time, F(2, 668)=5.07, p=0.007), indicating that participants in both groups showed significant small improvements from baseline to post-intervention (mean change=1.42, SD=11.61) and these changes were maintained at follow-up. Chart 4 illustrates the degree of change over time.

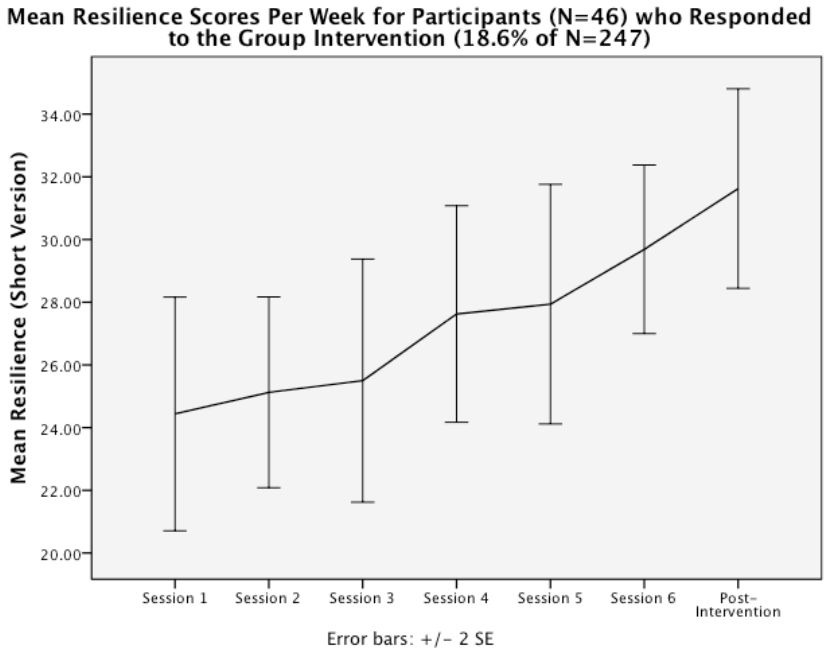
The average effects achieved were of a very small size (d = 0.09) with the majority of participants reporting changes that could not be deemed as reliable. Using the reliable change index of the measurement tool as an indicator, we found that of the N = 345 participants with post-intervention data, N = 57 (16.5%) reported a reliable improvement, N = 254 (73.6%) did not show any reliable change and N = 34 (9.9%) reported reliable deteriorations at post-intervention. **Taken together, the results reveal that 83.5% of the sample showed no improvement.**



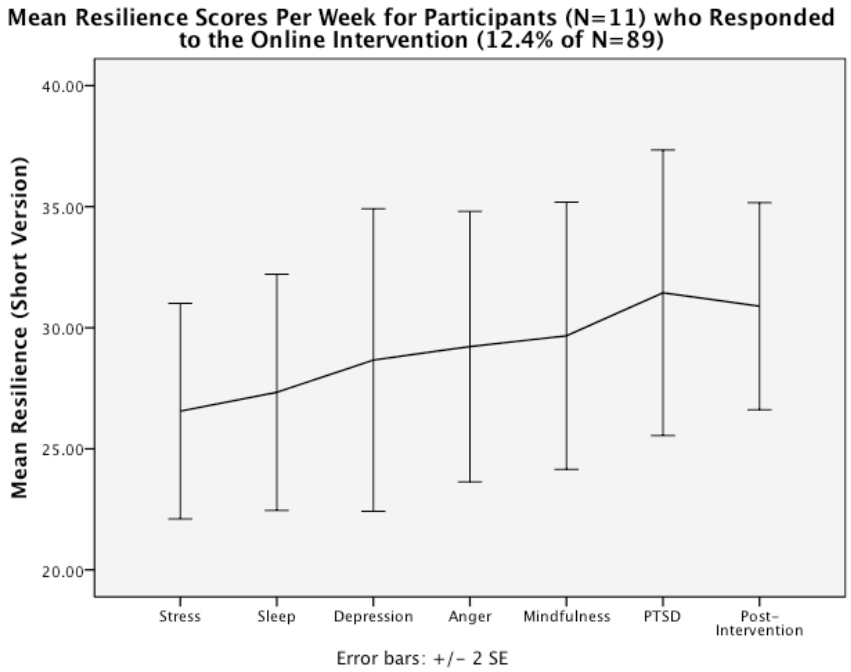
Which parts of the courses were most helpful for people whose resilience improved (N=57)?

We plotted the mean resilience scores per week for participants whose resilience improved with the group intervention (N=46) and with the online intervention (N=11). Whilst the samples of responders are small, Graphs 1 and 2 show that sessions 3, 5 and 6 of the group intervention are linked to the steepest incline of improvements. For the online intervention, the topics on sleep and mindfulness are linked to the steepest improvements.

Graph 1:



Graph 2:



Are the changes greater than what would be expected with the passage of time?
In an attempt to consider the influence of time, we compared changes in resilience in our natural wait-list group of N=33 participants who completed baseline questionnaires at two time points separated by 8 weeks prior to starting a course. Participants in the natural wait-list condition showed no significant improvements in resilience over time, t=-.372, df=32, p=.713, suggesting the possibility that improvements in resilience for a small number of participants (N=57) may be due to the group and online conditions.

Are there differences at the outset between those whose report improvements in resilience compared to those who do not?
Participants whose resilience improved during the course of the interventions (N=57) had significantly lower resilience and poorer problem solving ability at baseline than participants who made no improvement.

Measure	Improved (N=57)	No Change (N=234)	Got Worse (N=34)	F (2, 344)
	Mean (SD)	Mean (SD)	Mean (SD)	p<0.001
Baseline resilience	59.19 (15.09)	67.63 (14.60)	71.74 (14.26)	10.00
Problem solving ability	20.93 (4.45)	23.52 (4.81)	23.97 (3.96)	7.60

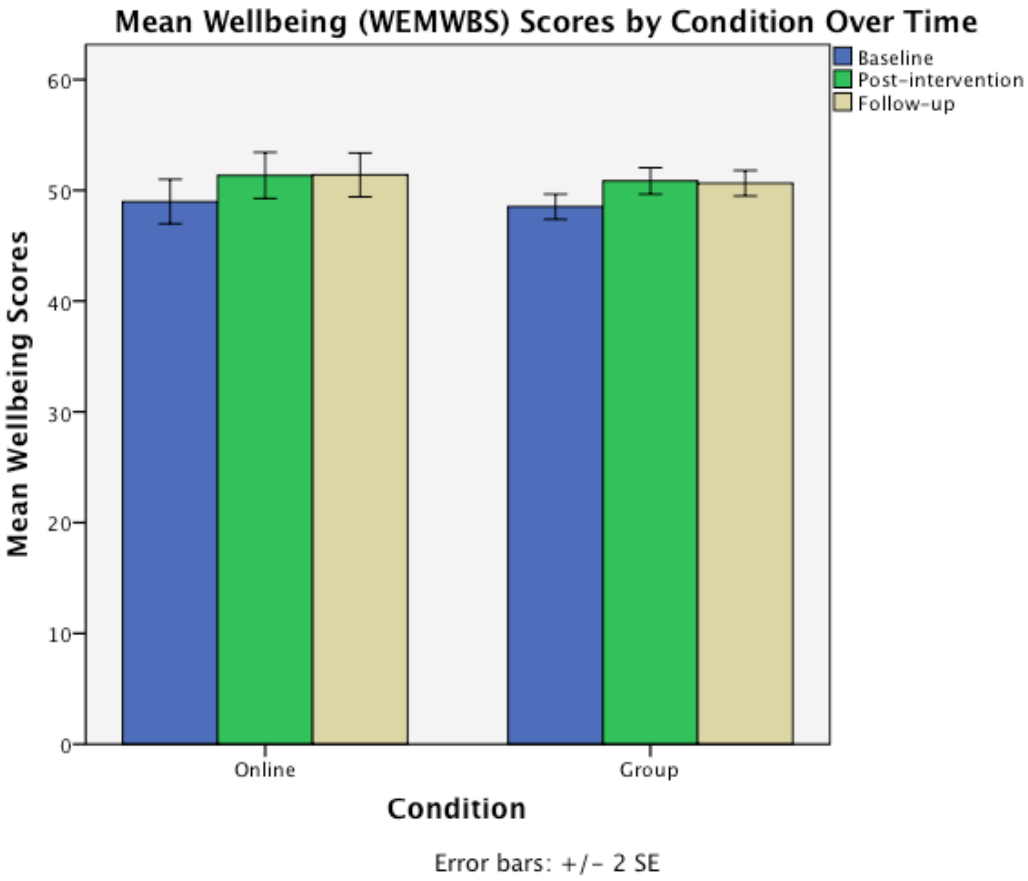
Did participants whose resilience deteriorated from baseline to post-intervention experience greater exposure to critical incidents or have poorer attendance during the interventions than the rest of the sample?
There were no differences in exposure to critical incidents or in attendance to sessions or topics completed between those who improved, those who made no change and those who got worse.

Wellbeing

A repeated measures ANOVA with three levels (baseline, post-intervention and follow-up) revealed there were no significant differences in levels of wellbeing between the two groups, F(1.95, 652.29)=0.06, p=0.941. Participants in the resilience and control conditions did not differ significantly in their rates of change on the measure of wellbeing. There was a significant main effect of time, F(1.95, 652.29)=17.16, p<0.001), indicating that participants in both groups showed significant small improvements from baseline to post-intervention (mean change=2.22, SD=7.35) and these changes were maintained at follow-up. Chart 5 illustrates the degree of change over time.

The average effects achieved were of a small size (d = 0.25) with the majority of participants reporting changes that could not be deemed as reliable. Using the reliable change index of the measurement tool as an indicator, we found that of the N = 345 participants with post-intervention data, N = 104 (30.1%) reported a reliable improvement, N = 193 (56.1%) did not show any reliable change, and N = 48 (13.9%) reported reliable deteriorations. **Taken together, the results reveal that 70% of the sample showed no improvement in wellbeing.**

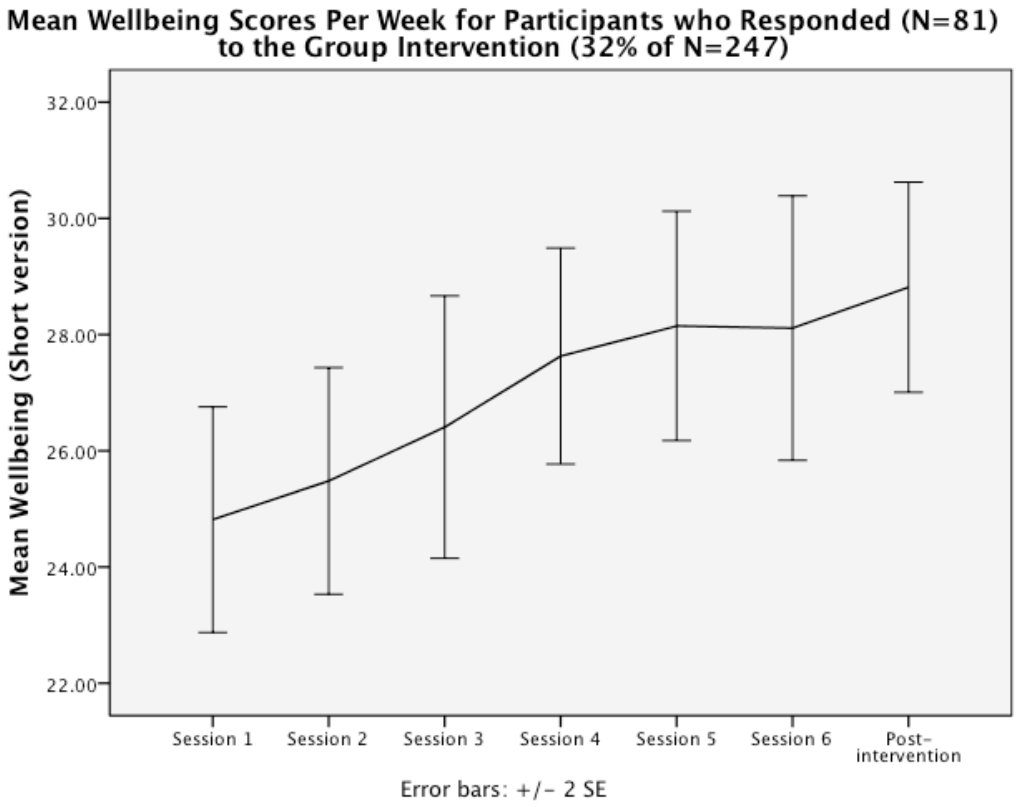
Chart 5



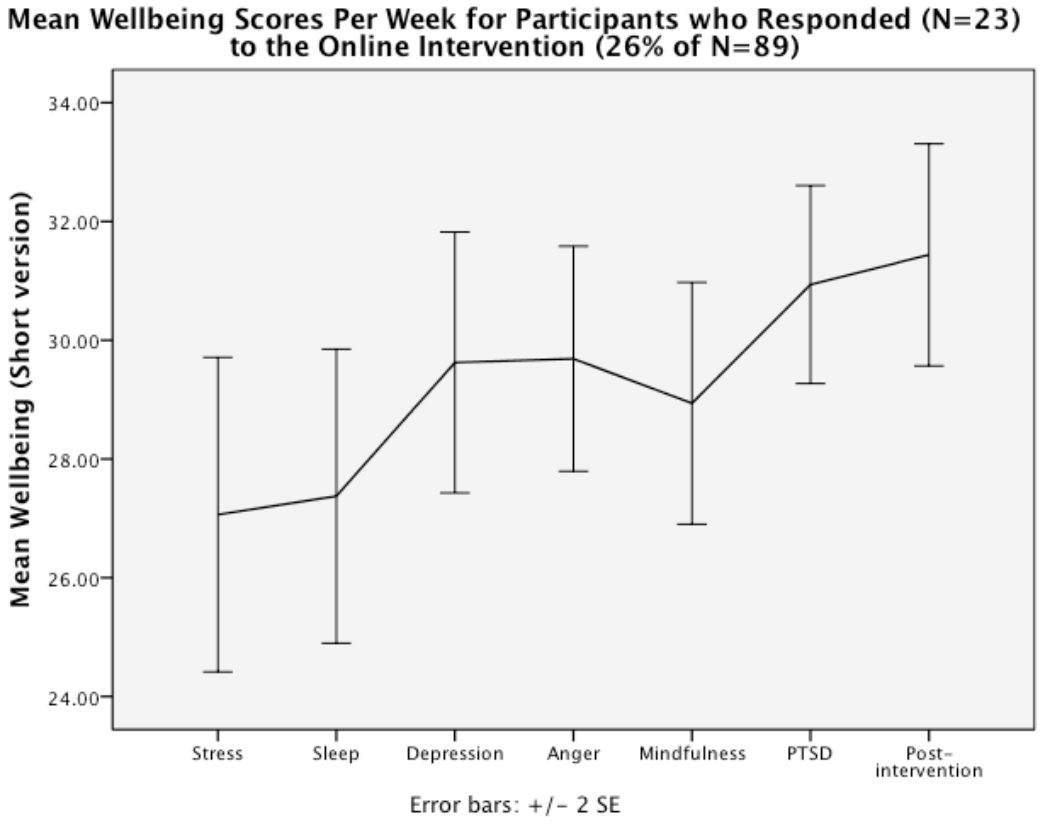
Which parts of the courses were most helpful for people whose wellbeing improved (N=104)?

We plotted the mean wellbeing scores per week for participants whose wellbeing improved with the group intervention (N=81) and with the online intervention (N=23). Whilst the samples of responders are small, Graphs 4 and 5 show that sessions 2, 3 and 6 of the group intervention are linked to the steepest incline of improvements. For the online intervention, the topics on sleep, mindfulness and PTSD are linked to the steepest improvements, which correspond to the topics for which participants gave the highest ratings.

Graph 3



Graph 4

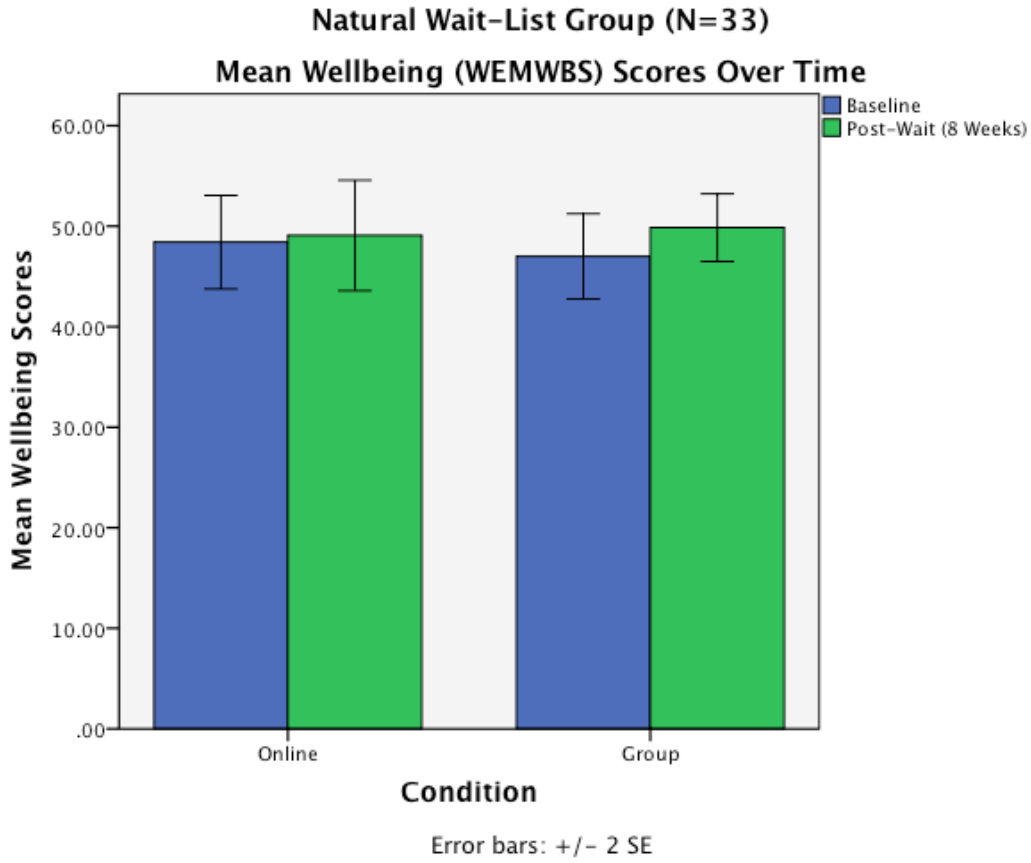


Are the changes greater than what would be expected with the passage of time?
Since there was no formal wait-list condition, we cannot be sure that the changes in wellbeing are related to the interventions or to the passage of time. In an attempt to consider the influence of time, we compared changes in wellbeing in our natural wait-list group of N=33 participants who completed baseline questionnaires at two time points separated by 8 weeks prior to starting a course.

Participants in the natural wait-list condition showed similar levels of improvement in wellbeing (mean change=2.06, SD=5.31), suggesting that changes in wellbeing for participants who attended a course may be due to the passage of time. Chart 6 shows changes in wellbeing for participants in the natural wait-list condition.

A smaller proportion of participants showed reliable improvement during the wait-list period: 11.3% showed reliable improvement; 85.8% showed no change and 2.8% showed reliable deteriorations during this period, which is a smaller proportion than the 13.9% who reported reliable deteriorations in wellbeing during the group and online interventions, underscoring the importance of including a wait-list period as part of a future design.

Chart 6



Are there differences at the outset between those who report improvements in wellbeing compared to those who do not?
Whilst the above comparisons suggest that the changes observed over time could be due to the passage of time, we continued to investigate characteristics of people who showed reliable improvement in wellbeing with the caveat that their improvements may be unrelated to the interventions. Participants whose wellbeing improved during the course of the interventions (N=104) had significantly lower wellbeing at baseline than participants who made no improvement or who got worse, $F(2,137)=16.09$, $p<0.001$. The interventions were also most likely to be helpful for people who had higher scores on the depression (PHQ-9) scale at baseline, although it should be noted that these scores still fell in the non-clinical range.

Measure	Improved (N=104)	No Change (N=193)	Got Worse (N=48)	F (2, 344), p=0.001
	Mean (SD)	Mean (SD)	Mean (SD)	
Baseline wellbeing	44.62 (9.33)	50.37 (8.19)	50.33 (8.82)	16.09
PHQ-9	4.95 (4.44)	3.19 (3.33)	3.39 (3.88)	6.37[1]

[1]Welch's F Value, degrees of freedom (2,115.56)

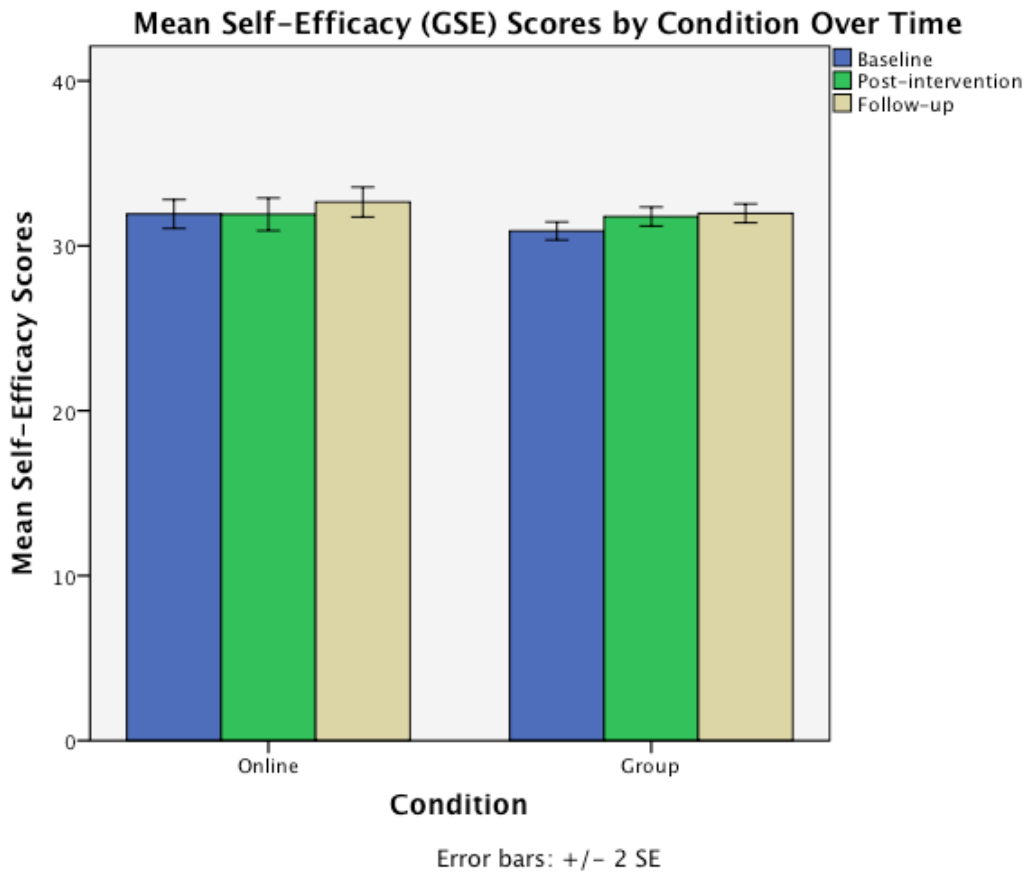
Did participants whose wellbeing deteriorated from baseline to post-intervention experience greater exposure to critical incidents or have poorer attendance during the interventions than the rest of the sample?
There were no differences in exposure to critical incidents or in attendance to sessions or topics completed between those who improved, those who made no change and those who got worse.

Self-Efficacy

A repeated measures ANOVA revealed there were no significant differences in levels of self-efficacy between the two treatment groups at baseline, post-intervention and follow-up, $F(2, 668)=1.85$, $p=0.157$. Participants in the resilience and control conditions did not differ significantly in their rates of change on the measure of self-efficacy. There was a significant main effect of time, $F(2, 668)=7.21$, $p=0.001$), indicating that participants in both groups showed significant small improvements from baseline to post-intervention (mean change=0.62, SD=3.74) and these changes were maintained at follow-up. Chart 7 illustrates the degree of change over time.

The average effects achieved were of a very small size ($d = 0.14$) with the majority of participants reporting changes that could not be deemed as reliable. Using the reliable change index of the measurement tool as an indicator, we found that of the N = 345 participants with post-intervention data, N = 59 (17.1%) reported a reliable improvement, N = 243 (70.4%) did not show any reliable change and N = 43 (12.5%) reported reliable deteriorations. **Taken together, the results reveal that 82.9% of the sample showed no improvement.**

Chart 7



Are the changes greater than what would be expected with the passage of time?
In an attempt to consider the influence of time, we compared changes in self-efficacy in our natural wait-list group of N=33 participants who completed baseline questionnaires at two time points separated by 8 weeks prior to starting a course. Participants in the natural wait-list condition showed no significant improvements in self-efficacy over time, t=-.486, df=32, p=.630, suggesting the possibility that improvements in self-efficacy for a small number of participants (N=59) may be due to the group and online interventions.

Are there differences at the outset between those whose report improvements in self-efficacy compared to those who do not?
Participants whose self-efficacy improved during the course of the interventions (N=59) had significantly lower self-efficacy at baseline compared to participants who made no improvement.

Measure	Improved (N=59)	No Change (N=243)	Got Worse (N=43)	F (2, 344)
	Mean (SD)	Mean (SD)	Mean (SD)	p<0.001
Baseline self-efficacy	29.08 (3.45)	31.12 (4.27)	34.28 (3.64)	20.30

Did participants whose self-efficacy deteriorated from baseline to post-intervention experience greater exposure to critical incidents or have poorer attendance during the interventions than the rest of the sample?
There were no differences in exposure to critical incidents or in attendance to sessions or topics completed between those who improved, those who made no change and those who got worse.

Social Capital

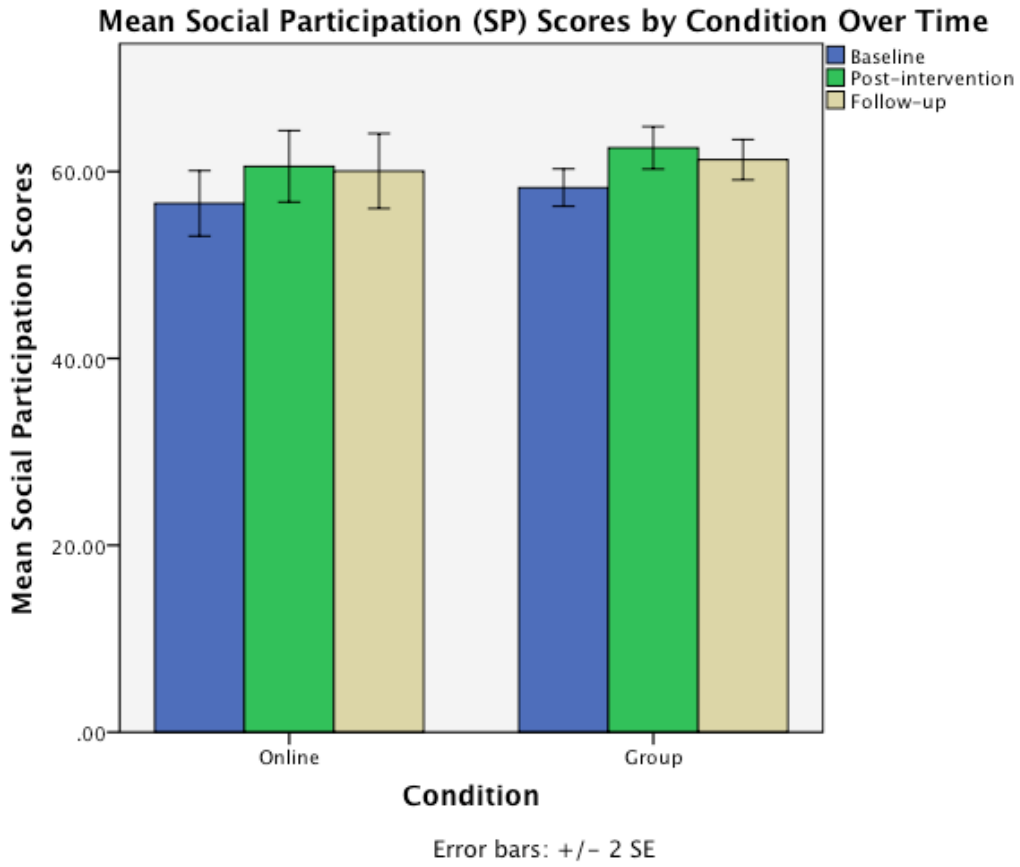
We measured changes in social participation and social support at home and at work as measures of social capital.

Social Participation

A repeated measures ANOVA revealed there were no significant differences in levels of social participation between the two treatment groups at baseline, post-intervention and follow-up, $F(1.96, 654.84)= 0.110$, $p=0.892$. Participants in the resilience and control conditions did not differ significantly in their rates of change on the measure of social participation. There was a significant main effect of time, $F(1.96, 654.84)=14.14$, $p<0.001$), indicating that participants in both groups showed significant small improvements from baseline to post-intervention (mean change=3.90, SD=13.35) and these changes were maintained at follow-up. Chart 8 illustrates the degree of change over time.

The average effects achieved were of a small size (d = 0.20) with the majority of participants reporting changes that could not be deemed as reliable. Using the reliable change index of the measurement tool as an indicator, we found that of the N = 345 participants with post-intervention data, N = 73 (21.2%) reported a reliable improvement, N = 233 (67.5%) did not show any reliable change and N = 39 (11.3%) reported reliable deteriorations at post-intervention. **Taken together, the results reveal that 78.8% of the sample showed no improvement.**

Chart 8



Are the changes greater than what would be expected with the passage of time?
In an attempt to consider the influence of time, we compared changes in social participation in our natural wait-list group of N=33 participants who completed baseline questionnaires at two time points separated by 8 weeks prior to starting a course. Participants in the natural wait-list condition showed no significant improvements in social participation over time, t=.286, df=32, p=.777, suggesting the possibility that improvements in social participation for a small number of participants (N=73) may be due to the group and online interventions.

Are there differences at the outset between those who report improvements in social participation compared to those who do not?
Participants whose social participation improved during the course of the interventions (N=73) engaged less frequently in meaningful social encounters at baseline compared to participants who made no improvement.

Measure	Improved (N=73)	No Change (N=233)	Got Worse (N=39)	F (2, 344)
	Mean (SD)	Mean (SD)	Mean (SD)	p<0.001
Baseline social participation	50.75 (14.04)	59.76 (15.97)	61.13 (14.90)	10.33

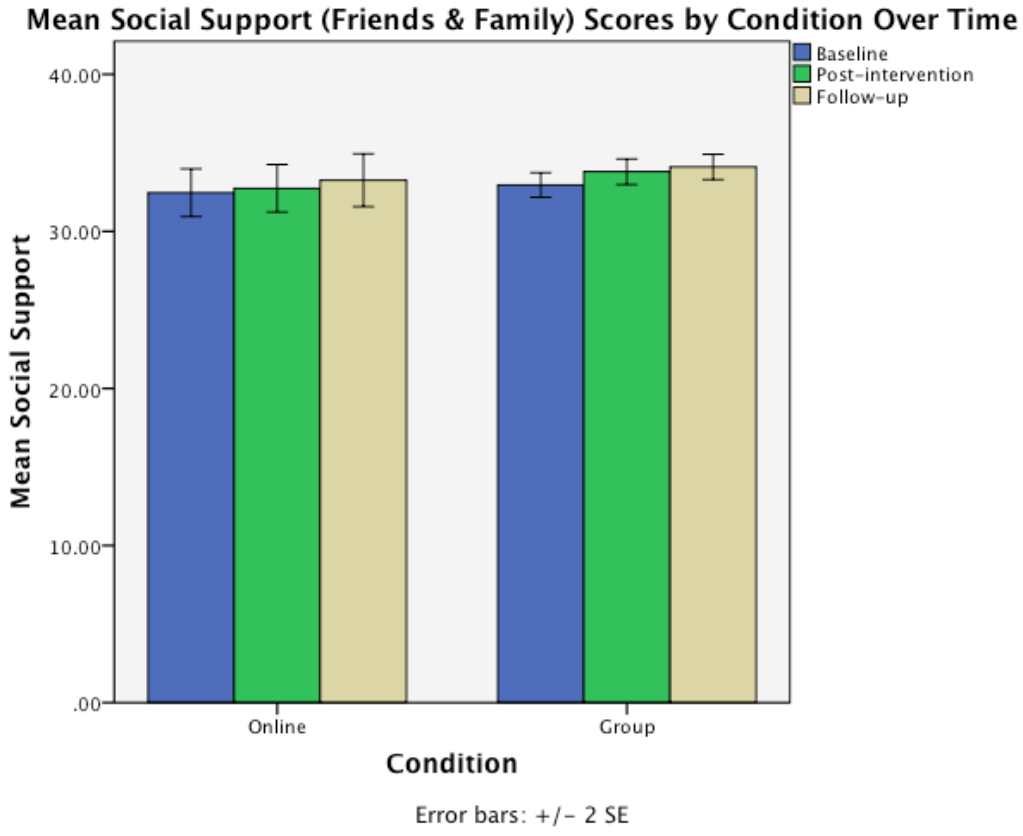
Did participants whose social participation deteriorated from baseline to post-intervention experience greater exposure to critical incidents or have poorer attendance during the interventions than the rest of the sample?
There were no differences in exposure to critical incidents or in attendance to sessions or topics completed between those who improved, those who made no change and those who got worse.

Social support at home

A repeated measures ANOVA revealed there were no significant differences in feeling supported at home between the two treatment groups at baseline, post-intervention and follow-up, F(2, 668)= 0.402, p=0.669. Participants in the resilience and control conditions did not differ significantly in their rates of change on the measure of social support with friends and family. There was a significant main effect of time, F(2, 668)=4.72, p=0.009), indicating that participants in both groups showed significant small improvements from baseline to post-intervention (mean change=0.617, SD=5.18) and these changes were maintained at follow-up. Chart 9 illustrates the degree of change over time.

The average effects achieved were of a very small size (d = 0.07) with the majority of participants reporting changes that could not be deemed as reliable. Using the reliable change index of the measurement tool as an indicator, we found that of the N = 345 participants with post-intervention data, N = 27 (7.8%) reported a reliable improvement, N = 303 (87.8%) did not show any reliable change and N = 15 (4.3%) reported reliable deteriorations at post-intervention. **Taken together, the results reveal that 92.1% of the sample showed no improvement.**

Chart 9



Are the changes greater than what would be expected with the passage of time?
In an attempt to consider the influence of time, we compared changes in social support with friends and family in our natural wait-list group of N=33 participants who completed baseline questionnaires at two time points separated by 8 weeks prior to starting a course. Participants in the natural wait-list condition showed no significant improvements in feeling supported by friends and family over time, t=.446, df=32, p=.658, suggesting the possibility that improvements in social participation for a small number of participants (N=27) may be due to the group and online interventions.

Are there differences at the outset between those whose report improvements in social support compared to those who do not?
Participants whose social support improved during the course of the interventions (N=27) had significantly lower social participation at baseline compared to participants who made no improvement.

Baseline Measure	Improved (N=27)	No Change (N=303)	Got Worse (N=15)	F (2, 343), p<0.001
	Mean (SD)	Mean (SD)	Mean (SD)	
Social Participation	29.56 (5.66)	32.72 (6.19)	40.27 (4.96)	15.01

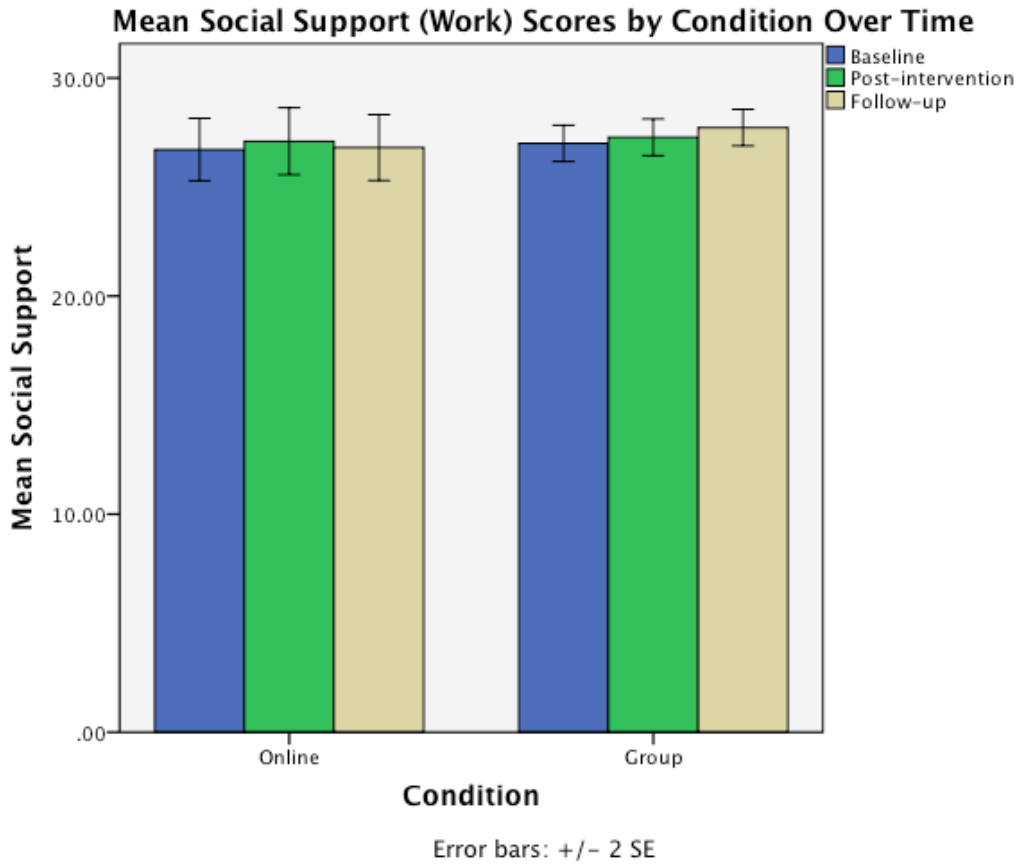
Did participants whose social support with family and friends deteriorated from baseline to post-intervention experience greater exposure to critical incidents or have poorer attendance during the interventions than the rest of the sample?

There were no differences in exposure to critical incidents or in attendance to sessions or topics completed between those who improved, those who made no change and those who got worse.

Social support at work

A repeated measures ANOVA revealed there were no significant differences in feeling supported at work between the two treatment groups at baseline, post-intervention and follow-up, F(1.88, 627.83)= 0.896, p=0.403. Participants in the resilience and control conditions did not differ significantly in their rates of change on the measure of social support with friends and family. There was no significant main effect of time, F(1.96, 654.84)=1.05, p=0.352), indicating that participants in both groups showed no improvements on this measure. Chart 10 shows the changes in social support at work at each of the assessment points for both conditions.

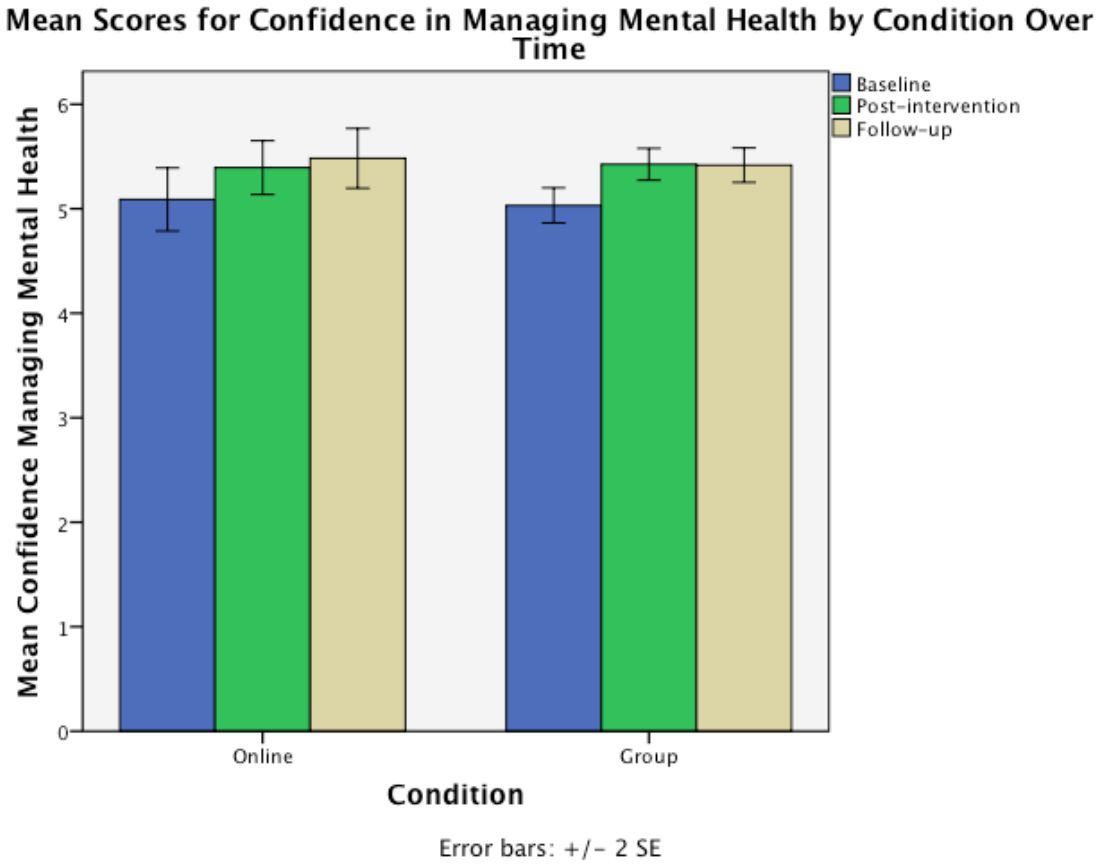
Chart 10



Confidence in managing mental health

The total score on this questionnaire violated assumptions of normality, which could not be corrected through log or square root transformations. Non-parametric tests were performed and revealed that many participants reported feeling significantly more confident in managing their mental health after their intervention and this change was maintained at follow-up, χ^2=39.58, p<0.001. However, the effect was small (r=0.20) and importantly, there were no significant differences between the resilience (Median=0.00) and control (Median=0.00) groups in the degree of change on this measure, *U*=11196.00=0.567. This measure was a one-item scale and as such, the reliable index of change could not be calculated. We therefore considered increments of one point or more as indications of improvement. The majority of participants N=142 (41.2%) report no change on this measure; N=137 (39.7%) report improvements of one or more increments and N=66 (19.1) appear to deteriorate. Chart 11 shows the small degree of change (mean=0.368, SD=1.27) on this measure over time.

Chart 11



Problem Solving

A repeated measures ANOVA revealed there were no significant differences in the ability to problem solve and reach goals between the two treatment groups at baseline, post-intervention and follow-up, F(1.95, 627.44)= 0.634, p=0.531. Participants in the resilience and control conditions did not differ significantly in their rates of change on their ability to become more effective at problem solving and reaching goals. There was a significant main effect of time, F(1.95, 627.44)=9.47, p<0.001), indicating that participants in both groups showed significant small improvements from baseline to post-intervention (mean change=0.985, SD=4.05) and these changes were maintained at follow-up. Chart 12 illustrates the degree of change over time.

The average effects achieved were of a small size (d = 0.20) with the majority of participants reporting changes that could not be deemed as reliable. Using the reliable change index of the measurement tool as an indicator, we found that of the N=339 participants with post-intervention data on this measure, N=81 (23.9%) reported a reliable improvement, N=221 (65.2%) did not show any reliable change and N=37 (10.9%) reported reliable deteriorations at post-intervention. **Taken together, the results reveal that 76.1% of the sample showed no improvement.**

Chart 12

Are the changes greater than what would be expected with the passage of time?
In an attempt to consider the influence of time, we compared changes in the ability to problem solve in our natural wait-list group of N=33 participants who completed baseline questionnaires at two time points separated by 8 weeks prior to starting a course. Participants in the natural wait-list condition showed no significant improvements in the ability to problem solve over time, t=-1.2, df=28, p=.24, suggesting the possibility that improvements in the ability to solve problems for a small number of participants (N=81) may be due to the group and online interventions.

Are there differences at the outset between those who report improvements in problem-solving at post-intervention compared to those who do not?
Participants whose problem-solving improved during the course of the interventions (N=81) had significantly lower resilience, wellbeing, and problem solving ability and greater anxiety and depressive attributions at baseline compared to participants who made no improvement.

Baseline Measure	Improved (N=81)	No Change (N=221)	Got Worse (N=37)	F (2, 344)
	Mean (SD)	Mean (SD)	Mean (SD)	p<0.001
Resilience (CD-RISC)	61.04 (15.65)	68.53 (14.53)	68.62 (13.78)	8.01
Wellbeing (WEMWBS)	45.51 (9.07)	49.94 (8.63)	48.03 (9.12)	7.63
Problem-Solving ability	19.47 (4.47)	24.10 (4.31)	25.19 (3.77)	39.23
Anxiety (GAD-7)	4.43 (4.30)	2.53 (2.73)	3.54 (3.94)	7.51[1]
Depressive Attributions (AQ)	24.93 (8.97)	20.95 (8.05)	22.89 (8.22)	6.99

[1]Welch's F value, degrees of freedom=(2,78.24)

Did participants whose problem solving deteriorated from baseline to post-intervention experience greater exposure to critical incidents or have poorer attendance during the interventions than the rest of the sample?

There were no differences in exposure to critical incidents or in attendance to sessions or topics completed between those who improved, those who made no change and those who got worse.

Number of days off work

A repeated measures ANOVA revealed there were no significant differences in the total number of days off per week between the two treatment groups at baseline, post-intervention and follow-up, F(1.71, 562.74)= 0.107, p=0.869. There was no significant main effect of time, F(1.71, 562.74)=1.25, p=0.284), indicating that participants in both groups showed no reductions in time off work during the course of the study.

Mental Health Outcomes

We assessed changes at each assessment point in measures of severe stress (PTSD), depression, anxiety, and alcohol use. There were no significant between-group differences on any of these measures at any assessment point. That is, participants in the resilience and online conditions did not differ significantly in their rates of change on these measures. Both groups showed significant, small changes in depression by post-intervention, which were maintained at follow-up. Unfortunately, the effects achieved were very small.

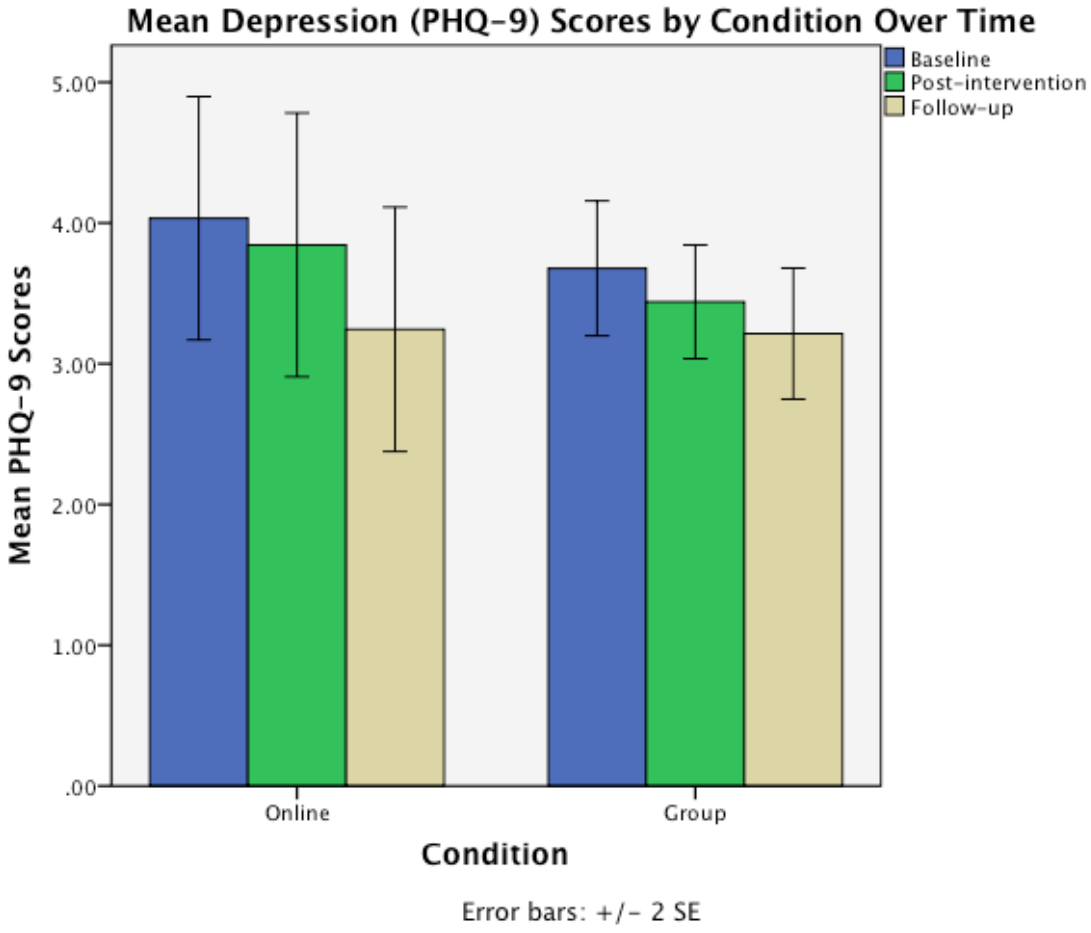
Depression (PHQ-9)

There was a significant main effect of time, F(1.86, 625.17)=4.56, p<0.01), indicating that participants in both groups showed significant small improvements from baseline to post-intervention (mean change= -0.179, SD=3.61) and these changes were maintained at follow-up. Chart 13 illustrates the degree of change over time.

The average effects achieved were of a small size (d = 0.23) with the majority of participants reporting changes that could not be deemed as reliable. Using the reliable change index of

the measurement tool as an indicator, we found that of the N = 347 participants with post-intervention data on this measure, N = 42 (12.1%) reported a reliable improvement, N = 271 (78.1%) did not show any reliable change and N = 34 (9.8%) reported reliable deteriorations at post-intervention. **Taken together, the results reveal that 87.9% of the sample showed no improvement.**

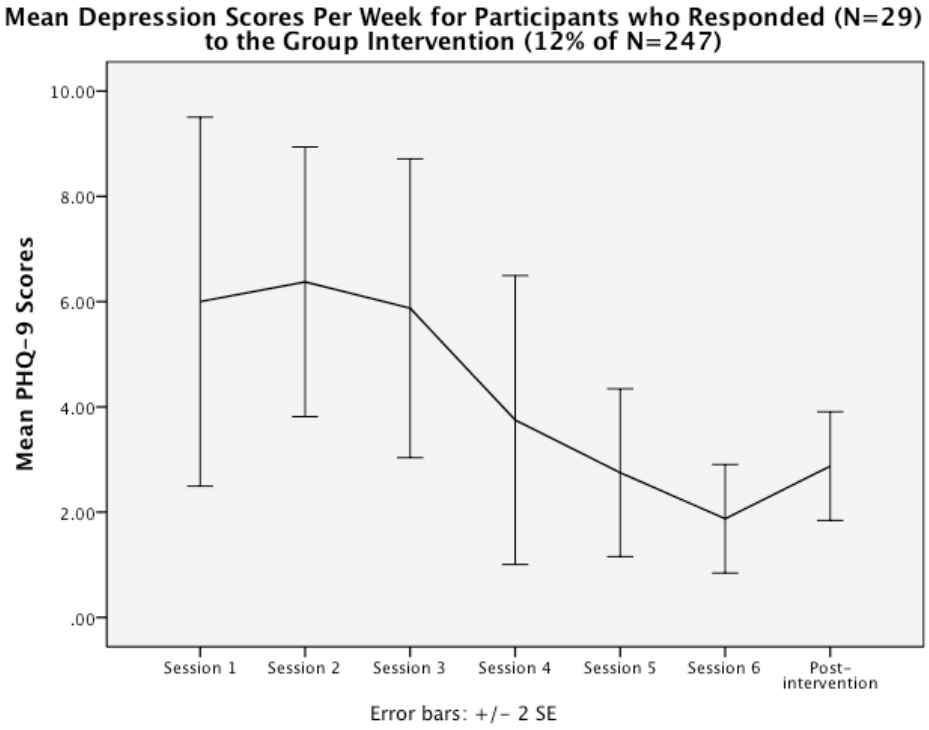
Chart 13



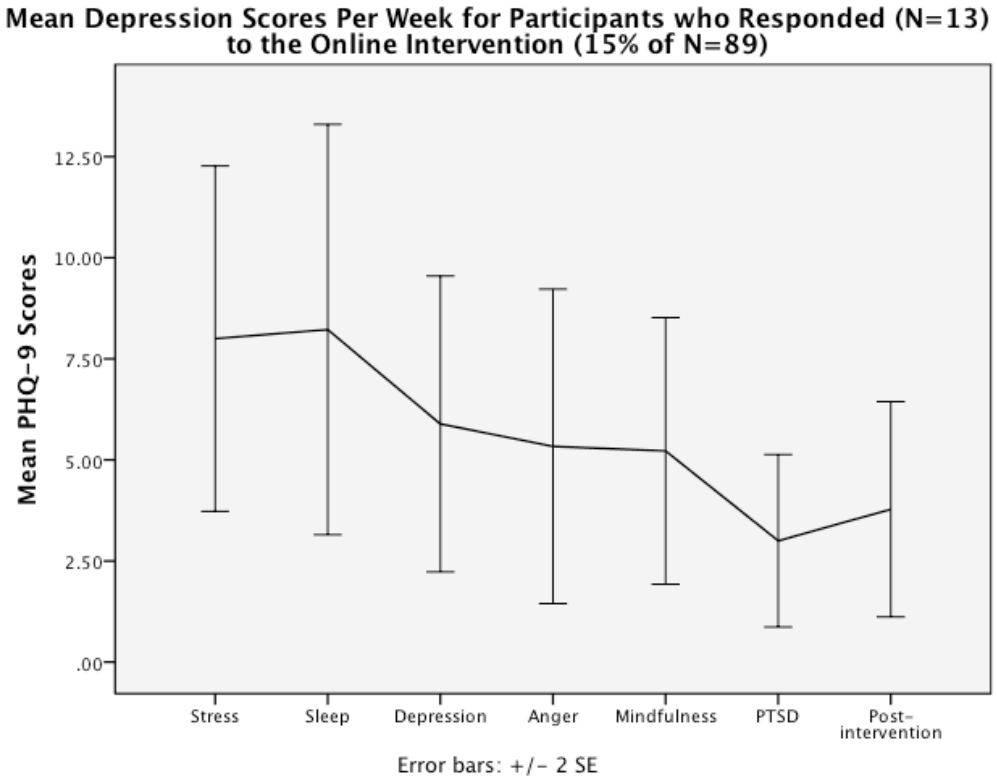
Which part of the courses were most helpful for people whose mood improved (N=42)?

We plotted the mean depression scores per week for participants whose mood improved with the group intervention (N=29) and with the online intervention (N=13). Whilst the samples of responders are small, Graphs 4 and 5 show that sessions 3, 4 and 5 of the group intervention are linked to the greatest improvements. For the online intervention, the topics on sleep and mindfulness are linked to the greatest improvements, which correspond to the topics for which participants gave the highest ratings.

Graph 4



Graph 5



Are the changes greater than what would be expected with the passage of time?
In an attempt to consider the influence of time, we compared changes in mood in our natural wait-list group of N=33 participants who completed baseline questionnaires at two time points separated by 8 weeks prior to starting a course. Participants in the natural wait-list condition showed no significant improvements in mood over time, t=-.316, df=32, p=.754, suggesting the possibility that the improvements in mood for 12.1% of the sample are due to the interventions.

Are there differences at the outset between those who report improvements in mood at post-intervention compared to those who do not?
Participants whose mood improved (N=42) during the course of the interventions appear to be a more vulnerable group, showing significant differences to the rest of the sample on a number of measures at baseline. Of note, participants whose mood reliably improves with the interventions (N=42) on average meet clinical cut-off on measures of depression (e.g.,PHQ-9) and anxiety (e.g., GAD-7) at baseline.

Baseline Measure	Improved (N=59)	No Change (N=243)	Got Worse (N=43)	F value (df=2,346)
	Mean (SD)	Mean (SD)	Mean (SD)	p<0.001
Resilience (CD-RISC)	58.81 (13.46)	68.48 (14.86)	62.68 (14.85)	9.30
Wellbeing (WEMWBS)	45.94 (5.05)	50.28 (8.85)	40.40 (7.40)	33.64[1]
Problem-Solving ability	21.62 (4.17)	23.78 (4.60)	20.36 (4.98)	12.12
Coping by self-distraction	5.38 (1.35)	4.53 (1.50)	5.21 (1.72)	7.86[2]
Coping by self-blame	5.06 (1.94)	3.79 (1.57)	4.40 (1.50)	10.91
Coping by wishful thinking	7.41 (2.43)	6.24 (2.50)	7.81 (2.54)	9.51
Social Participation	51.68 (14.76)	60.00 (15.93)	51.21 (13.76)	9.02
Feeling supported at work	23.82 (5.95)	27.72 (6.32)	24.38 (7.28)	9.39
PTSD (PCL-5)	18.17 (17.14)	7.45 (11.35)	8.79 (10.25)	7.67[3]
Depression (PHQ-9)	9.69 (4.41)	2.96 (2.95)	2.68 (2.84)	46.17[4]
Anxiety (GAD-7)	7.19 (4.32)	2.48 (2.84)	2.76 (2.44)	23.08[5]
Depressive Attributions (AQ)	27.86 (9.03)	20.89 (7.84)	25.03 (8.82)	15.91
Neuroticism	6.40 (2.63)	4.72 (3.43)	6.15 (2.92)	8.71[6]
Rumination	44.73 (9.77)	38.41 (13.18)	49.17 (14.20	14.54
Rumination in response to unwanted memories	9.06 (5.55)	6.73 (5.16)	9.88 (5.57)	8.60
Confidence in managing mental health	4.85 (1.21)	5.24 (1.27)	4.02 (1.37)	17.01

[1]Welch's F value, degrees of freedom=(2, 73.73)
[2]Welch's F value, degrees of freedom=(2, 61.11)
[3]Welch's F value, degrees of freedom=(2, 59.22)
[4]Welch's F value, degrees of freedom=(2, 58.46)
[5]Welch's F value, degrees of freedom=(2, 59.90)
[6]Welch's F value, degrees of freedom=(2, 66.57)

Did participants whose mood deteriorated from baseline to post-intervention experience greater exposure to critical incidents or have poorer attendance during the interventions than the rest of the sample?

There were no differences in exposure to critical incidents or in attendance to sessions or topics completed between those who improved, those who made no change and those who got worse.

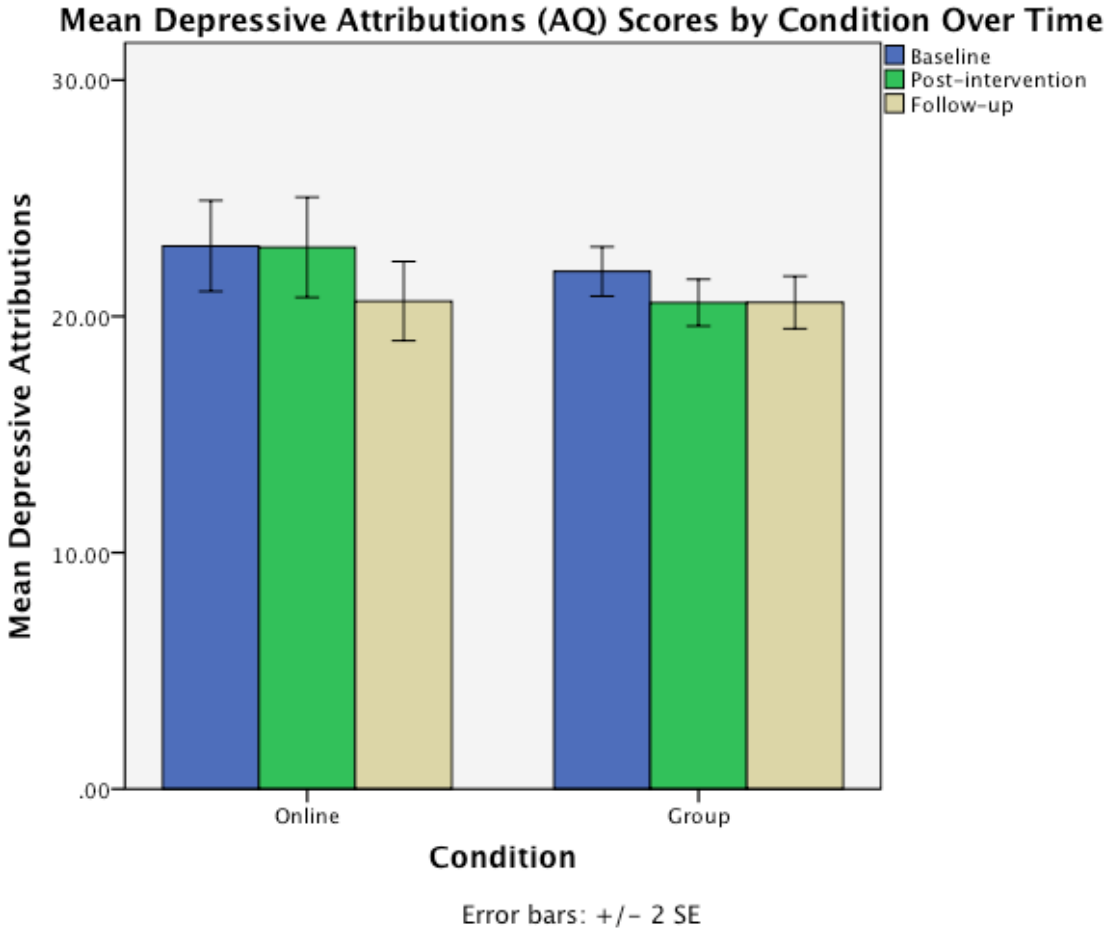
Cognitive and Behavioural Factors

We assessed changes at each assessment point on key cognitive and behavioural factors, including nine possible coping behaviours in response to stress (self-distraction, active coping, acceptance, denial, substance use, seek emotional support, behavioural disengagement, self-blame and wishful thinking), rumination, depressive attributions and maladaptive responses to intrusive memories (suppression, rumination and numbing). We corrected for multiple testing using Bonferonni correction (p=0.05/30), which yielded a significance level of p=0.002. There were no significant between-group differences on any of these measures at any assessment point. That is, participants in the resilience and online conditions did not differ significantly in their rates of change on these measures. Both groups showed significant, small changes in coping by self-blame and wishful thinking and in depressive attributions and rumination, which were maintained at follow-up. Unfortunately, the effects achieved were very small. Using the reliable change index of the measurement tool as an indicator, we found that no participants made reliable improvements in coping by self-blame or wishful thinking.

Depressive Attributions

There was a significant main effect of time, $F(2, 668)=9.4$, $p<0.001$), indicating that participants in both groups showed significant small improvements from baseline to post-intervention (mean change= -0.997, SD=6.63) and these changes were maintained at follow-up. Chart 14 illustrates the degree of change over time. The average effects achieved were of an extremely small size (d = 0.11) with the majority of participants reporting changes that could not be deemed as reliable. Using the reliable change index of the measurement tool as an indicator, we found that of the N = 346 participants with post-intervention data on this measure, N = 66 (19.1%) reported a reliable improvement, N = 239 (69.1%) did not show any reliable change and N = 41 (11.8%) reported reliable deteriorations at post-intervention. **Taken together, the results reveal that 80.9% of the sample showed no improvement.**

Chart 14



Are the changes greater than what would be expected with the passage of time?
In an attempt to consider the influence of time, we compared changes in depressive attributions in our natural wait-list group of N=33 participants who completed baseline questionnaires at two time points separated by 8 weeks prior to starting a course. Participants in the natural wait-list condition showed no significant reductions in depressive attributions over time, t=-0.968, df=32, p=.340, suggesting the possibility that the reductions in depressive attributions for 19.1% of the sample were due to the interventions.

Are there differences at the outset between those who report reductions in depressive attributions at post-intervention compared to those who do not?
Participants who experienced reductions in depressive attributions (N=66) during the course of the interventions appear to be a more vulnerable group at baseline, showing significant differences to the rest of the sample on a number of measures.

Baseline Measure	Improved (N=66)	No Change (N=239)	Got Worse (N=41)	F value (df=2,344)
	Mean (SD)	Mean (SD)	Mean (SD)	p<0.001
Resilience	62.00 (13.72)	67.84 (14.97)	67.44 (16.22)	4.03
Wellbeing	42.48 (8.01)	50.26 (8.22)	49.24 (10.69)	23.94[1]
Self-efficacy	29.71 (3.47)	31.53 (4.39)	31.49 (4.47)	6.45[2]

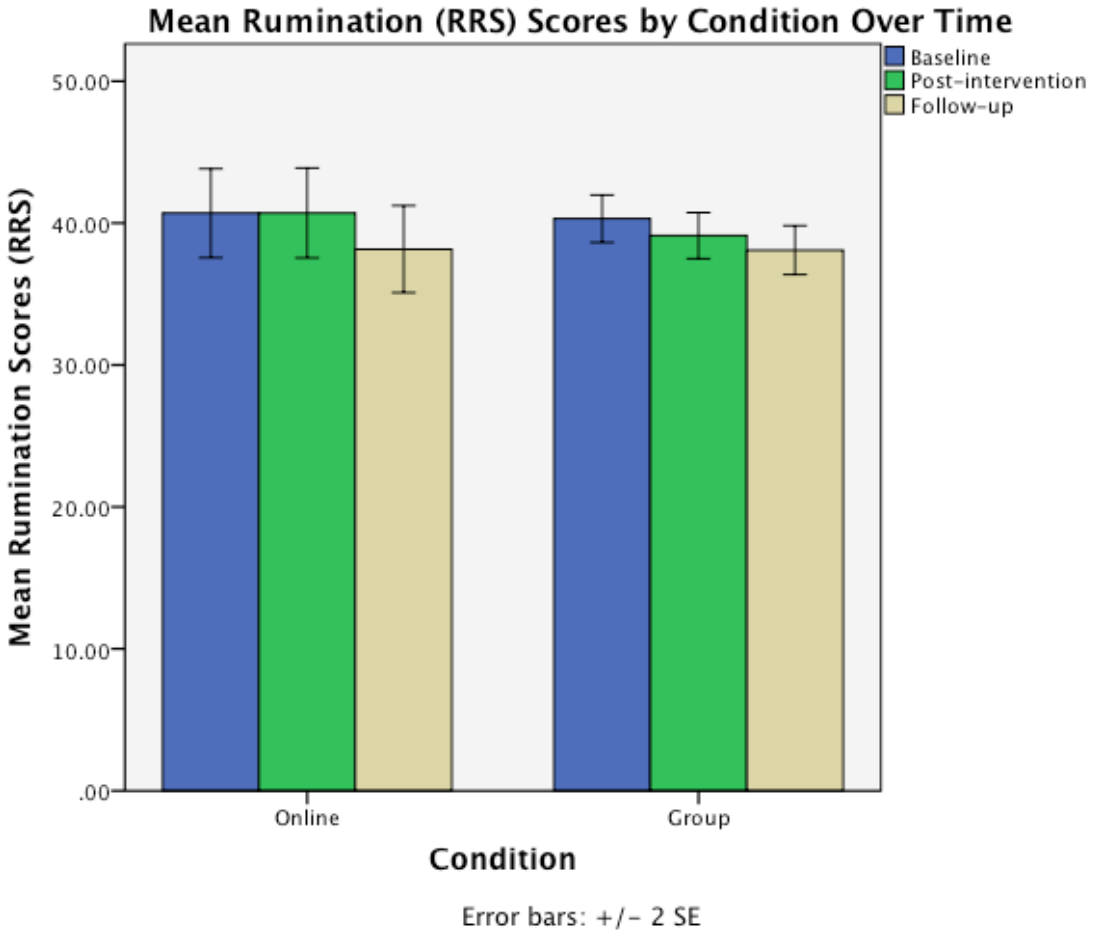
Problem solving	21.34 (3.81)	23.73 (4.88)	22.61 (4.72)	6.96
Coping by behavioural disengagement	3.30 (1.28)	2.61 (1.02)	2.73 (1.07)	8.29[3]
Coping by self-blame	4.36 (1.48)	3.73 (1.49)	4.93 (2.24)	12.03
Social Participation	51.70 (15.79)	59.96 (15.42)	57.02 (16.17)	7.38
PHQ-9	5.50 (4.92)	3.30 (3.37)	3.51 (3.80)	7.07[4]
GAD-7	4.94 (4.28)	2.59 (3.02)	2.95 (2.74)	8.72[5]
Neuroticism	6.76 (3.13)	4.59 (3.22)	5.20 (3.70)	11.50
Rumination	46.24 (15.20)	38.72 (12.38)	40.05 (14.93)	6.78
Rumination in response to intrusive memories	9.68 (5.49)	6.67 (5.15)	7.32 (5.46)	8.50[6]
Numbing in response to intrusive memories	4.39 (2.70)	2.97 (2.57)	3.00 (2.74)	7.81
Confidence in managing mental health	4.36 (1.43)	5.23 (1.27)	5.17 (1.24)	11.58

[1]Welch's F value, degrees of freedom=(2,84.75)
[2]Welch's F value, degrees of freedom=(2,92.60)
[3]Welch's F value, degrees of freedom=(2,85.00)
[4]Brown-Forsythe F value, degrees of freedom=(2,128.25)
[5]Welch's F value, degrees of freedom=(2,87.28)
[6] Welch's F value, degrees of freedom=(2, 82.69)

Rumination

There was a significant main effect of time, F(2, 668)=8.23, p<0.001), indicating that participants in both groups showed significant small improvements from baseline to post-intervention (mean change= -0.815, SD=9.47) and these changes were maintained at follow-up. Chart 15 illustrates the degree of change over time. The average effects achieved were of an extremely small size (d = 0.06) with the majority of participants reporting changes that could not be deemed as reliable. Using the reliable change index of the measurement tool as an indicator, we found that of the N = 346 participants with post-intervention data on this measure, N = = 69 (19.9%) reported a reliable improvement, N = 224 (64.7%) did not show any reliable change and 53 (15.3%) reported reliable deteriorations at post-intervention. **Taken together, the results reveal that 84.6% of the sample showed no improvement.**

Chart 15



Are the changes greater than what would be expected with the passage of time?
In an attempt to consider the influence of time, we compared changes in rumination in our natural wait-list group of N=33 participants who completed baseline questionnaires at two time points separated by 8 weeks prior to starting a course. Participants in the natural wait-list condition showed no significant improvements in rumination over time, t=0.868, df=32, p=.392, suggesting the possibility that the improvements in rumination for 19.9% of the sample are due to the interventions.

Are there differences at the outset between those who report reductions in rumination at post-intervention compared to those who do not?
Participants who experienced reductions in rumination (N=69) during the course of the interventions appear to be a more vulnerable group at baseline, showing significant differences to the rest of the sample on a number of measures.

Baseline Measure	Improved (N=69)	No Change (N=224)	Got Worse (N=53)	F value (df=2,345)
	Mean (SD)	Mean (SD)	Mean (SD)	p<0.001
Wellbeing	44.04 (8.14)	50.04 (8.82)	48.81 (8.99)	12.48
Coping by self-distraction	5.28 (1.50)	4.46 (1.50)	4.89 (1.54)	8.25

Coping by self-blame	4.10 (1.59)	3.76 (1.56)	4.85 (1.77)	10.12
Coping by wishful thinking	7.72 (2.20)	6.13 (2.47)	6.81 (2.84)	11.28
Social participation	51.25 (13.36)	60.45 (15.56)	56.68 (17.60)	9.56
Depressive attributions	25.38 (8.56)	20.70 (8.05)	24.15 (8.40)	10.40
Neuroticism	6.46 (3.05)	4.48 (3.34)	5.75 (3.20)	11.08
Rumination (RRS)	52.49 (12.30)	36.83 (12.42)	39.17 (10.40)	44.38
Rumination in response to unwanted memories	9.10 (5.03)	6.49 (5.34)	8.52 (5.21)	8.17
Numbing in response to unwanted memories	4.22 (2.68)	2.81 (2.49)	3.81 (3.01)	9.05
PHQ-9	5.65 (4.76)	3.23 (3.45)	3.43 (3.38)	7.68[1]
GAD-7	4.80 (4.48)	2.51 (2.86)	3.25 (3.02)	8.50[2]
Confidence managing mental health	4.54 (1.30)	5.21 (1.34)	5.08 (1.22)	6.92

[1]Welch's F value, degrees of freedom=(2,106.63)
[2] Welch's F value, degrees of freedom=(2,102.67)

Re-included Participants Who Scored Above Cut-off at Screening

Of the N=153 participants who scored above cut-off on the measure of depression (PHQ-9) and PTSD (PCL-5) at screening, N=64 were re-included in the study after telephone interview with the psychologist. The symptoms these participants had endorsed did not appear to be causing clinical interference or distress; participants did not meet criteria for risk and did not wish treatment. Of the N=64 who were re-included, N=3 withdrew before being randomly allocated, N=11 did not respond to messages about attending a resilience course and therefore could not be randomly allocated, leaving a total of N=50 who were initially excluded and then re-included in the sample. Of these participants, N=37 received the group intervention and N=13 received the online intervention. We compare this group to participants who were immediately eligible for inclusion in the study and who completed the group or online course.

Table 4: Baseline demographic data for participants who were re-included after exclusion and completed the intervention and participants who were immediately eligible and completed the intervention.

	Re-Included (N=50)		Immediately Eligible (N=378)	
	Mean	SD	Mean	SD
Age	40.48	9.55	41.48	9.79
Previous Traumas	5.18	2.98	4.51	3.45
PTSD (PCL-5)	20.72	17.29	7.42	11.00
Depression (PHQ-9)	8.12	4.22	3.27	3.54
Alcohol Use (AUDIT)	5.34	4.91	5.21	4.01
Resilience (CD-RISC)	59.66	13.55	67.68	14.62
Wellbeing (WEMWBS)	40.98	8.25	49.59	8.56
Self-efficacy (GSE)	30.26	4.29	31.25	4.21
No. of Years in Education	14.64	5.79	15.28	6.31
	N	%	N	%
Service: Police	28	56.0	195	51.6
Ambulance	10	20.0	110	29.1
Fire	11	22.0	57	15.1
Search & rescue	1	2.0	16	4.2
Marital Status: Single	14	28.0	61	16.1
Married	17	34.0	197	52.1
Divorced/separated	9	18.0	35	9.3
Widowed	0	0	3	0.79
Civil partnership	0	0	5	1.3
Long-term partner	10	20.0	77	20.4
Gender: Female	22	44.0	227	60.0
Male	28	56.0	151	39.9
Education Level: No qualification	0	0	3	0.79
GCSE	8	16.0	65	17.1
A Level	13	26.0	89	23.5
Degree/Other	29	58.0	193	51.5
Masters	0	0	23	6.1
PhD	0	0	5	1.3
Ethnicity: White British	46	92.0	338	89.4
White Irish	2	4.0	8	2.1
Eastern European	0	0	2	0.5
Other White Background	0	0	8	2.1
Caribbean	0	0	4	1.1
Indian	0	0	7	1.9
Pakistani	0	0	2	0.5
Another Asian Background	0	0	1	0.3
White & Asian	0	0	2	0.5
White & Black Caribbean	1	2.0	1	0.3
Other Mixed Background	1	2.0	0	0
Arab	0	0	1	0.3
Other Background	0	0	4	1.1

Differences at Baseline

As would be expected, participants who were initially excluded because they scored in the clinical range on screening measures for PTSD and depression were significantly more likely to have higher scores of PTSD and depression at baseline compared to participants who were immediately eligible, PTSD: $t(54.5)=5.3$, $p<0.001$, depression $t(58.5)=7.78$, $p<0.001$. They were also significantly more likely to have lower wellbeing, $t(417)= -6.90$, $p<0.001$, and lower resilience, $t(416)= -3.69$, $p<0.001$, at baseline compared to participants who were immediately eligible. Of the N=50 participants who were re-included, there were no differences in the number of women (44%) versus men (56%). However, there were significantly more men who were excluded (56%) compared to the number of men who were immediately eligible (39.9%) and significantly fewer women (44%) who were excluded compared to women who were immediately included (60.1%), $\chi^2(1)=4.67$, $p<0.001$. There were no differences on any other demographic or baseline measures.

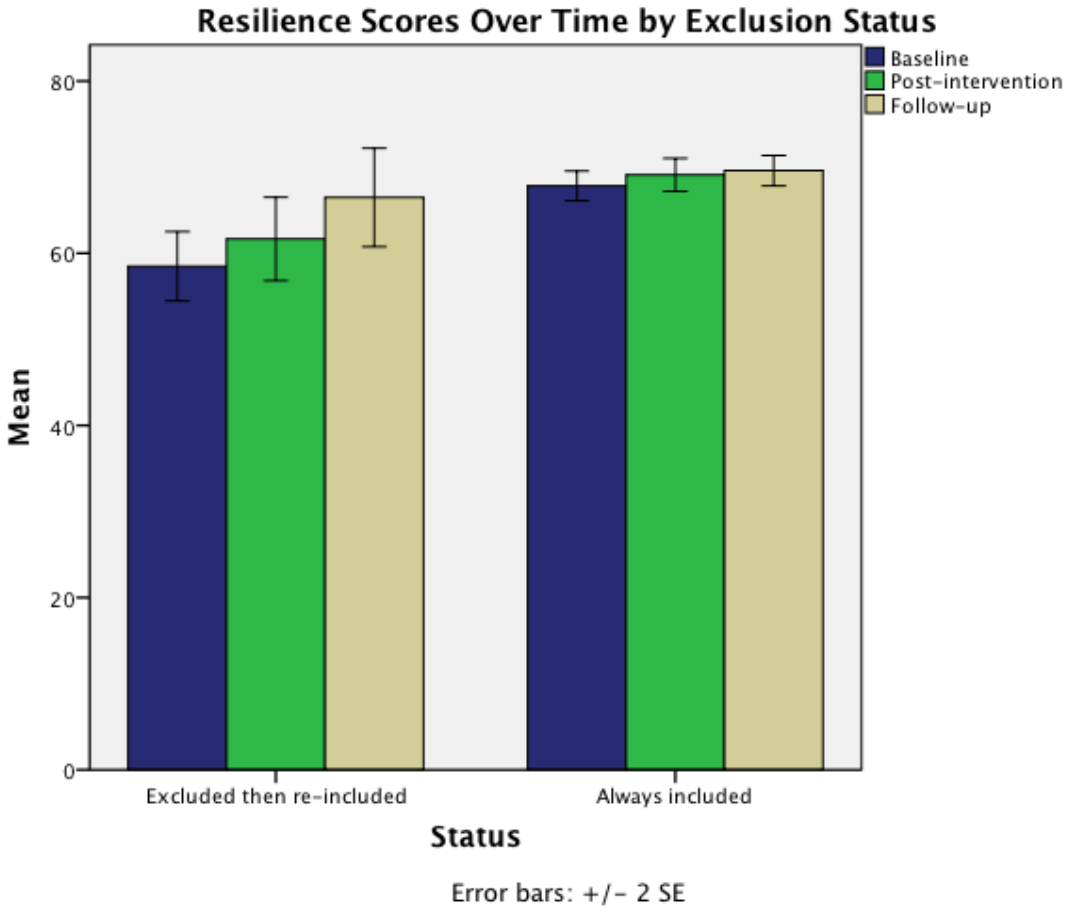
Differences in Outcome

We compared those who were excluded then re-included after screening with those who were immediately included at baseline on all outcome measures. Participants who were re-included were more likely to make significant improvements with the interventions than participants who were immediately eligible upon screening. This is in keeping with the overall finding that participants who experienced reliable improvements were also more likely to be more vulnerable at the outset than participants who did not improve with the interventions.

Resilience

Participants who were initially excluded and then re-included after clinical interview were significantly more likely to improve with the interventions than participants who had been immediately eligible from the outset, $F(2,670)=4.86$, $p<0.008$. Almost a third of participants (32.5%) showed reliable improvement.

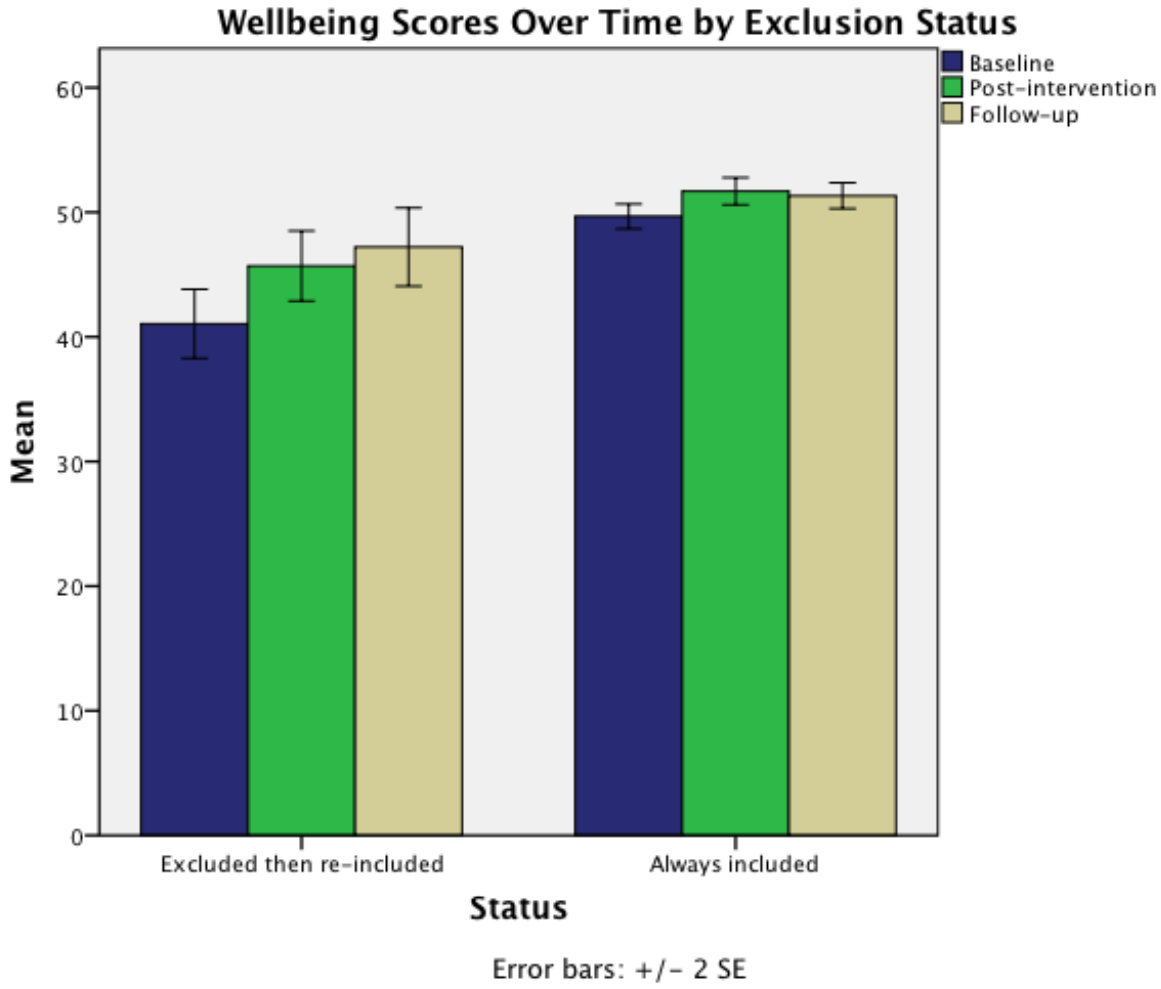
Chart 16



Wellbeing

Participants who were initially excluded and then re-included after clinical interview were significantly more likely to improve with the interventions than participants who had been immediately eligible from the outset, $F(1.96,656.99)=6.67$, $p<0.001$.

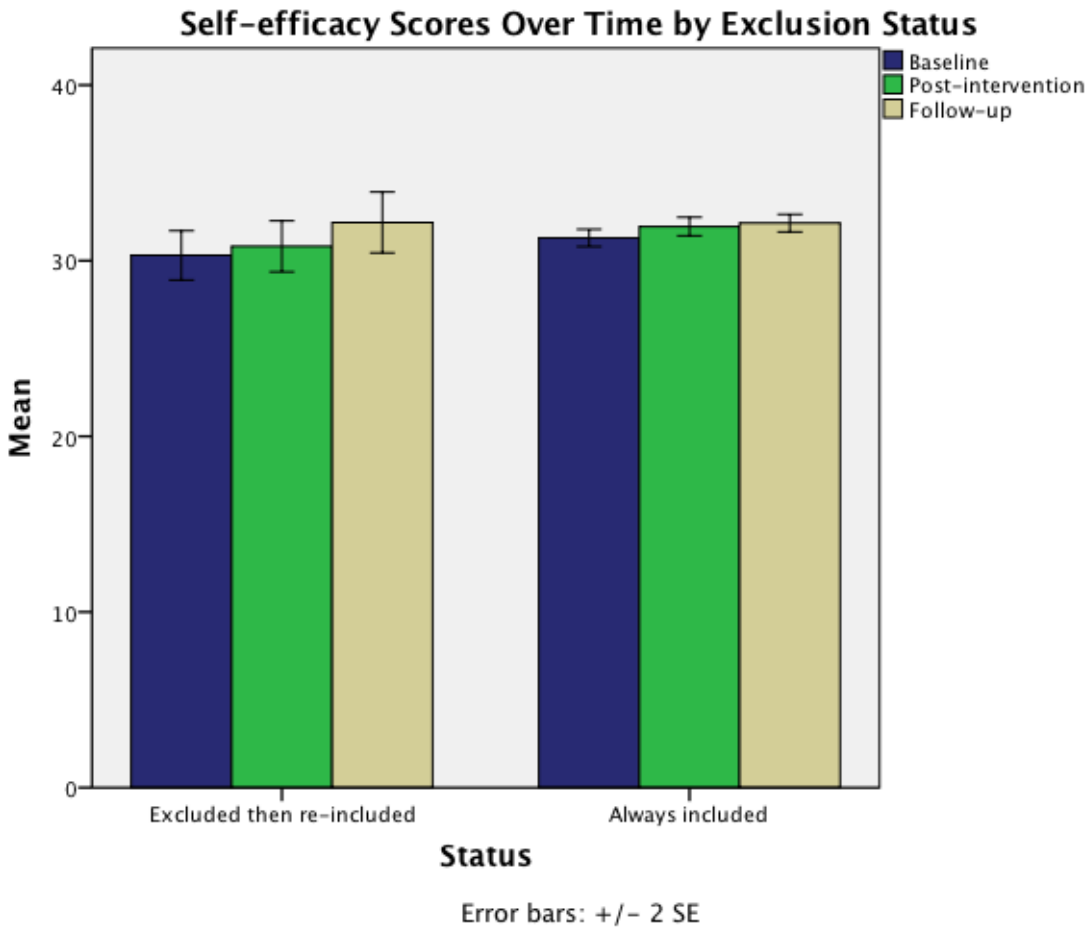
Chart 17



Self-efficacy

There were no differences in changes in self-efficacy between participants who were initially excluded and then re-included after clinical interview and participants who had been immediately eligible from the outset, $F(2, 670)=1.93$, $p=0.146$.

Chart 18

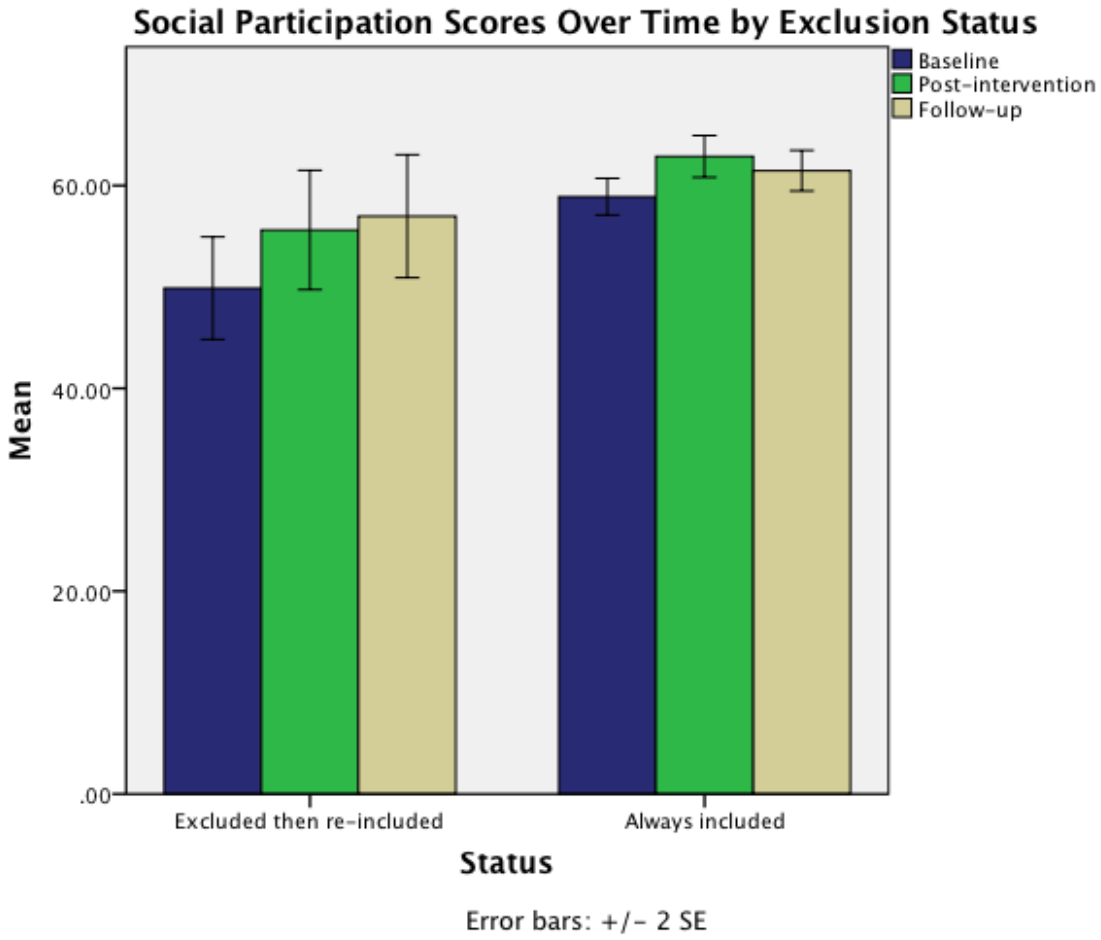


Social Capital

Social Participation

There were no differences in changes in social participation between participants who were initially excluded and then re-included after clinical interview and participants who had been immediately eligible from the outset, F(1.96, 657.44)=2.11, p=0.123.

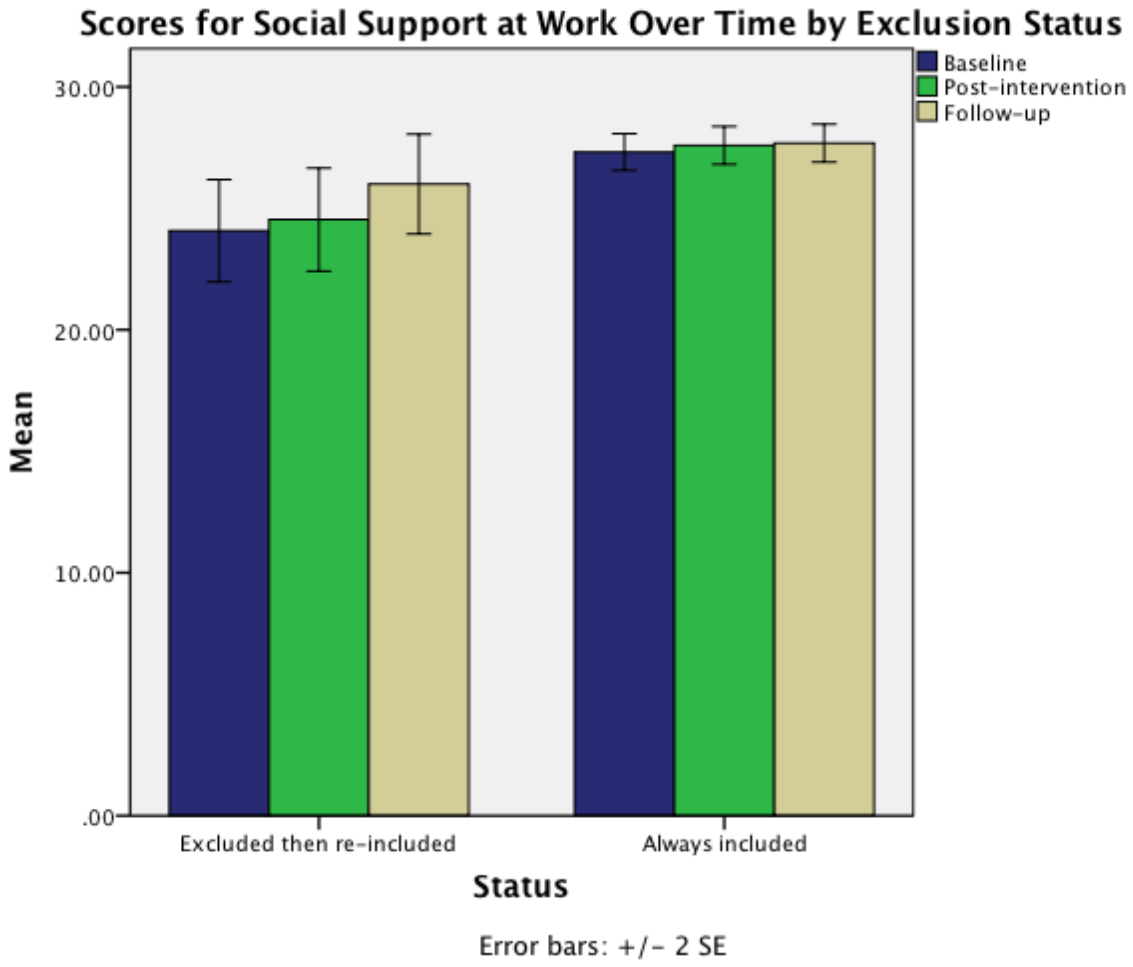
Chart 19



Social Support at Work

There were no differences in changes in social support at work between participants who were initially excluded and then re-included after clinical interview and participants who had been immediately eligible from the outset, F(1.88, 630.67)=2.16, p=0.12.

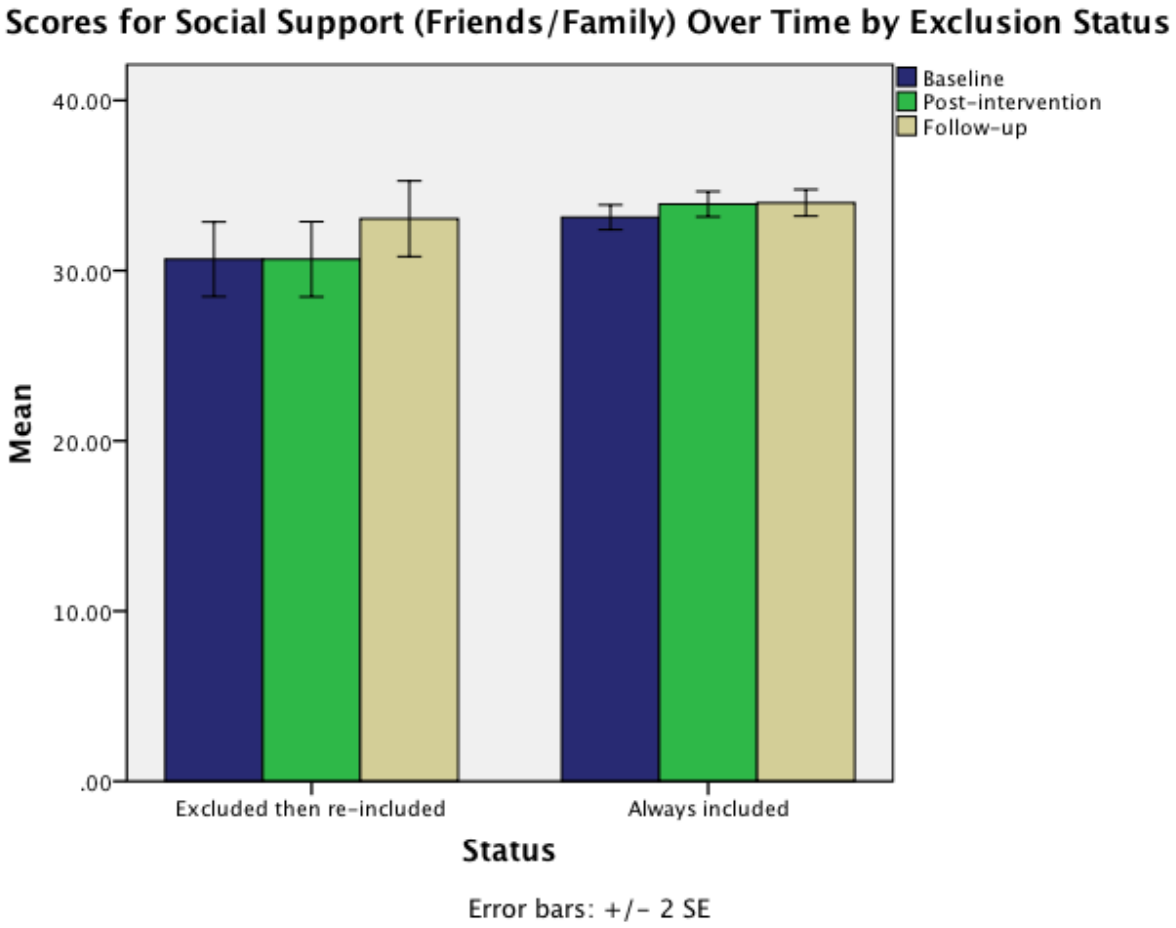
Chart 20



Social Support at Home

Participants who were initially excluded and then re-included after clinical interview were significantly more likely to improve with the interventions than participants who had been immediately eligible from the outset, $F(2, 670)=3.62$, $p<0.027$.

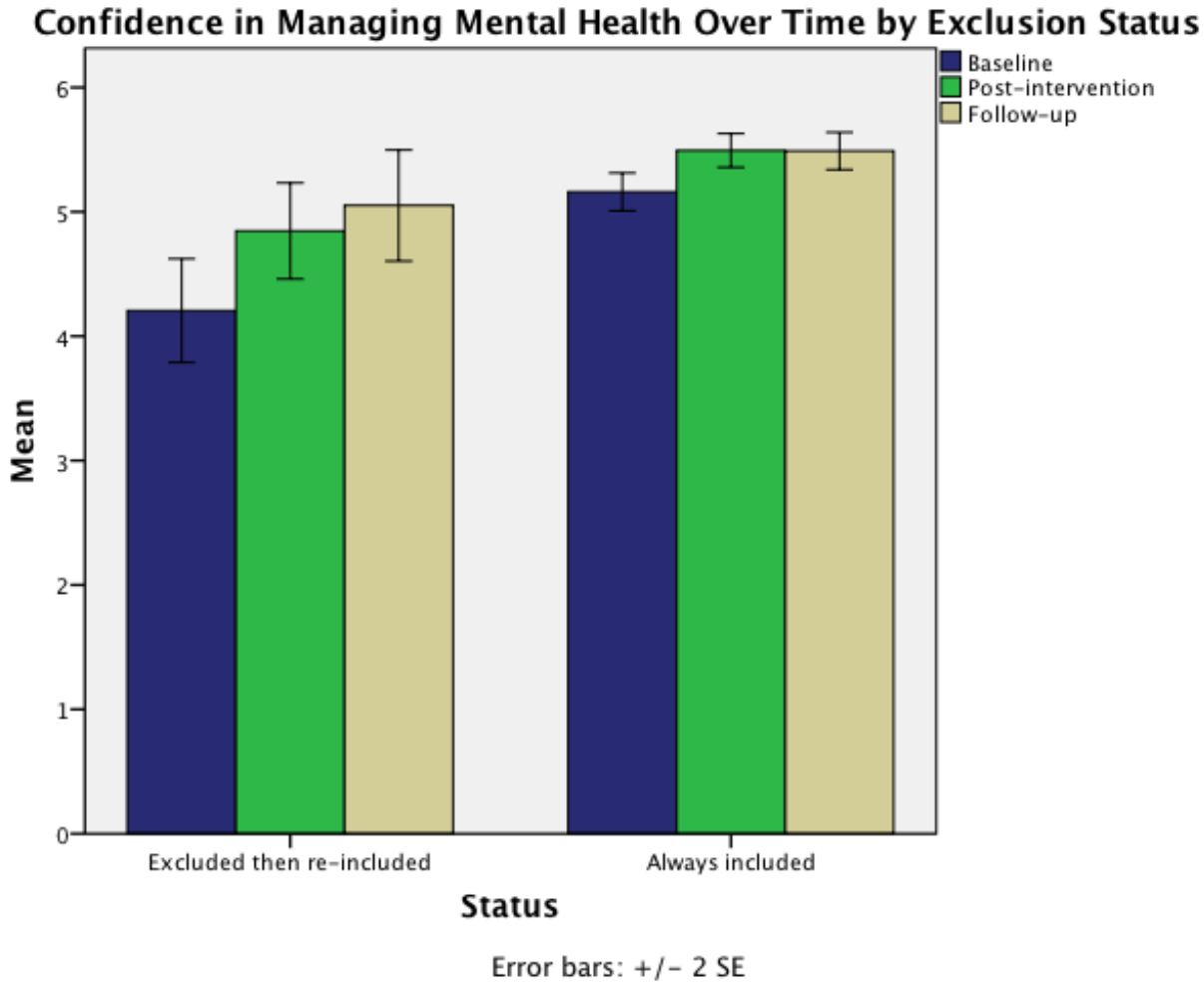
Chart 21



Confidence in Managing Mental Health

There was a trend for there to be significantly more change in participants' confidence about managing their mental health if they had been initially excluded then reincluded compared to participants who had been eligible to participate at the outset, *U*=5174.50=0.095.

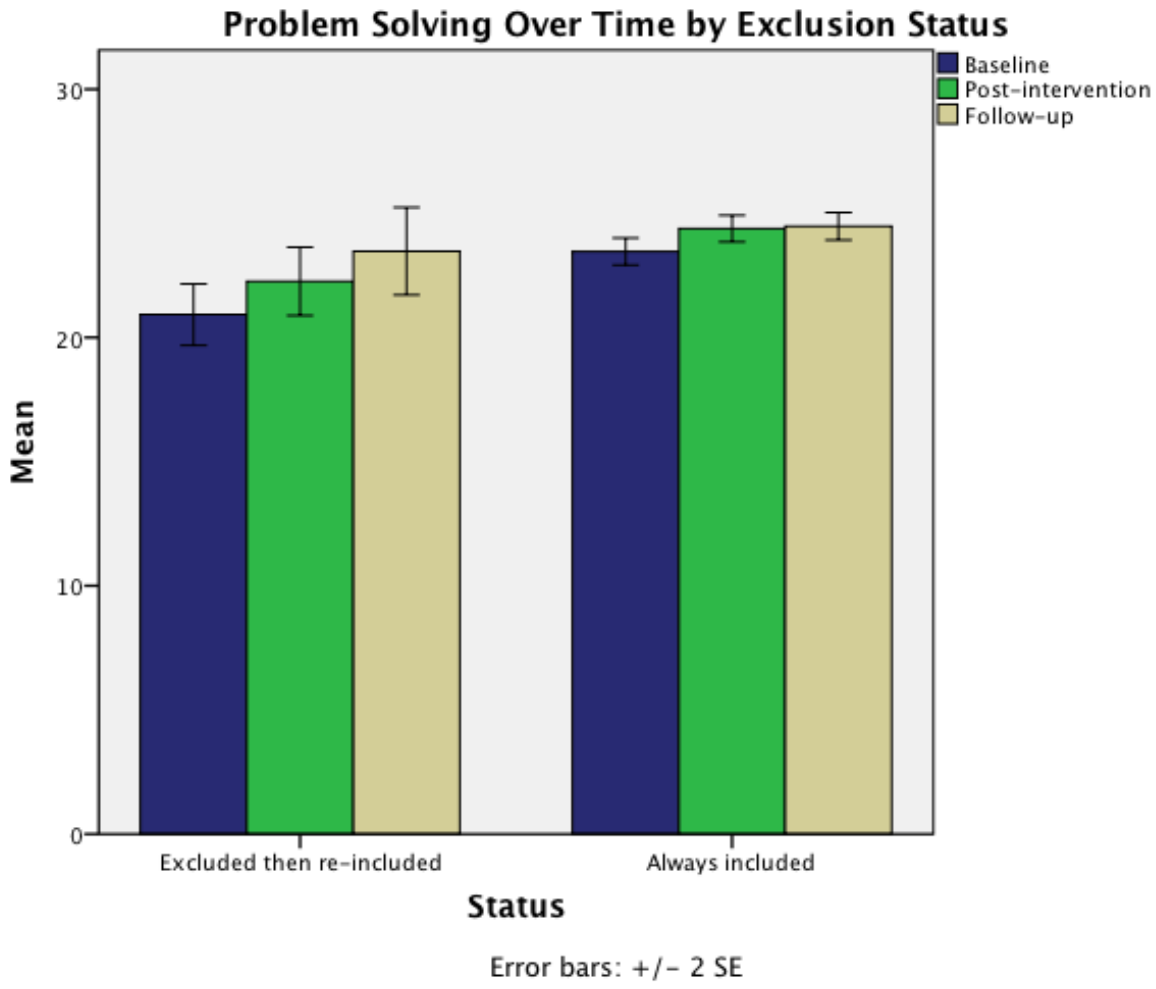
Chart 22



Problem Solving

There was a trend for participants who were initially excluded and then re-included after clinical interview to be more likely to improve with the interventions than participants who had been immediately eligible from the outset, $F(1.87, 630.20)=2.54$, $p<0.08$.

Chart 23



Total Number of Days off Work

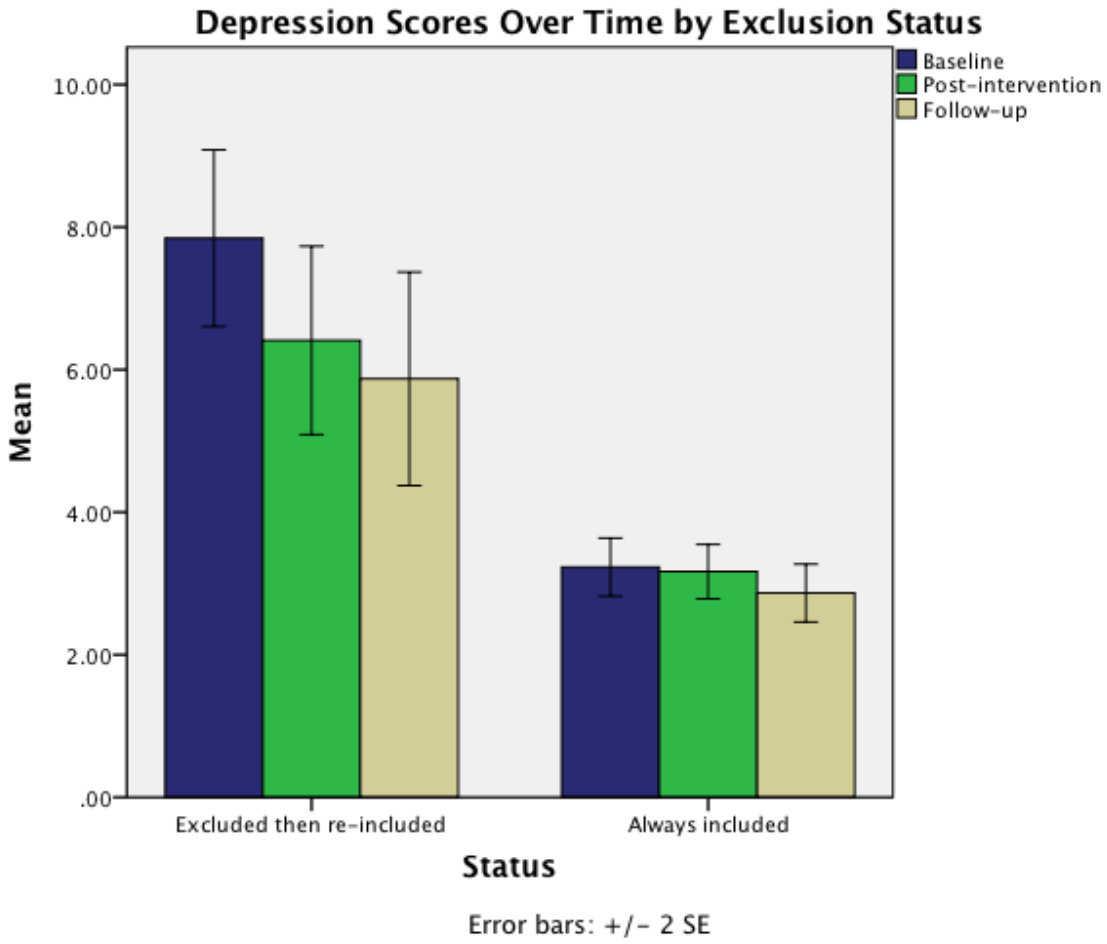
A repeated measures ANOVA revealed there were no significant differences in the total number of days off per week between participants who were initially excluded and then re-included and participants who were immediately included, $F(1.71, 565.74)=1.69$, $p=0.185$.

Mental Health Outcomes

Depression

Participants who were initially excluded and then re-included after clinical interview were significantly more likely to improve with the interventions than participants who had been immediately eligible from the outset, $F(1.87, 630.37)=4.50$, $p<0.013$.

Chart 24

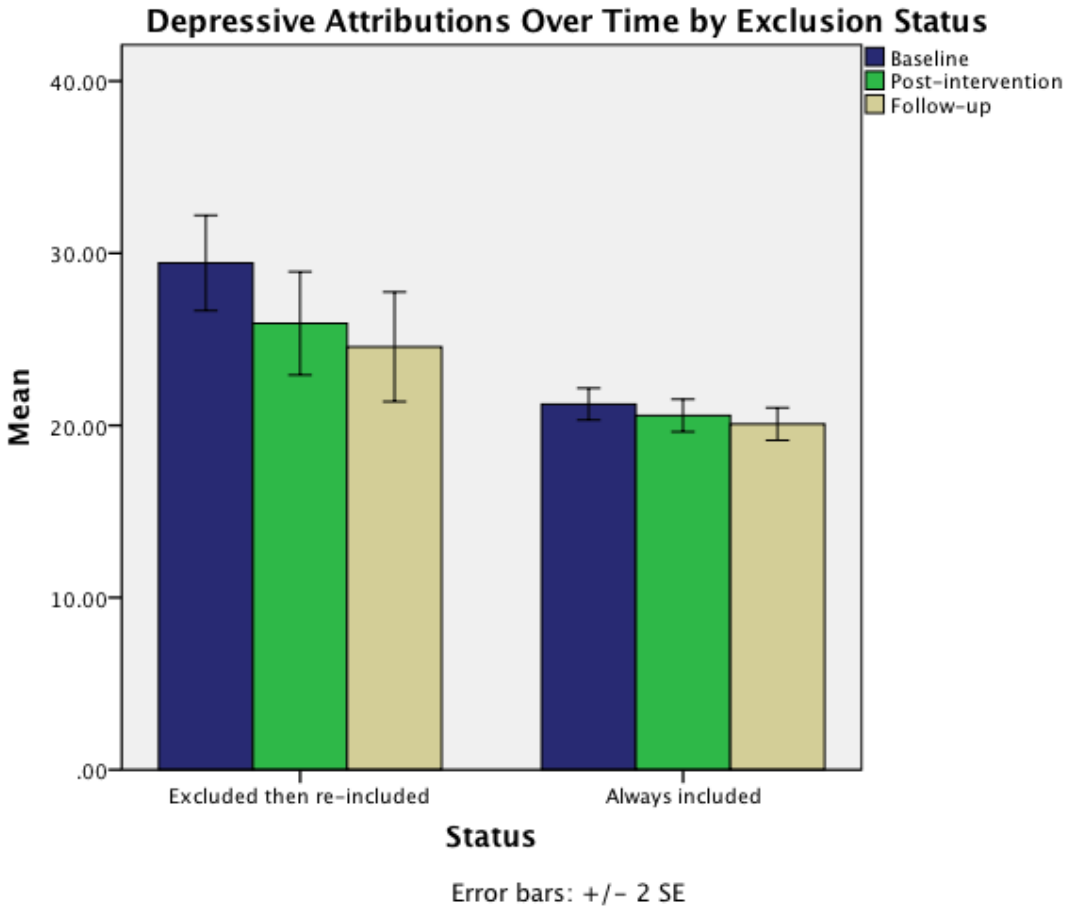


Cognitive and Behavioural Factors

Depressive Attributions

Participants who were initially excluded and then re-included after clinical interview were significantly more likely to improve with the interventions than participants who had been immediately eligible from the outset, $F(2,670)=5.55$, $p<0.004$.

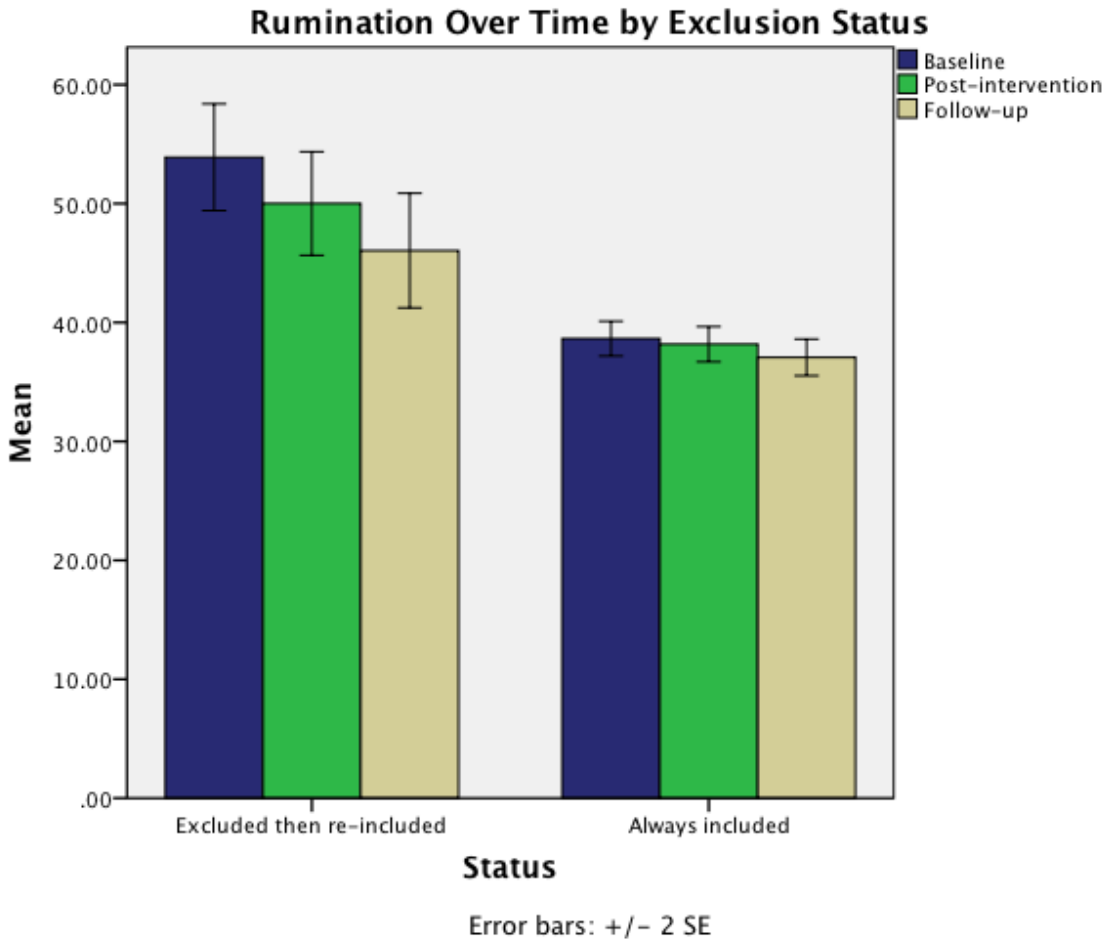
Chart 25



Rumination

Participants who were initially excluded and then re-included after clinical interview were significantly more likely to improve with the interventions than participants who had been immediately eligible from the outset, $F(2,670)=7.13$, $p<0.001$.

Chart 26



Qualitative Interviews

Participants

Sixteen participants (7 men, 9 women) were randomly selected from each of the four cohorts who received the resilience and online courses. Twelve participants had attended the group resilience course and four participants had completed the online intervention. Eight participants were police officers, 5 participants were ambulance workers, 2 participants worked for the fire service and one participant worked in search and rescue. Participants were interviewed after their three month follow-up. The mean number of weeks since their last group session or online topic was 16.75 (SD=4.83). Participants worked in their roles for a mean number of 3.5 years (SD=4.07) and had been with their service for a mean number of 10.96 years (SD=10.42).

We employed a phenomenological approach in which the focus was on participants' subjective experiences. Interviews were transcribed, yielding 337 pages of transcripts (which are available for the preparatory phase of the next evaluation of Mind's revised resilience

intervention). One researcher reviewed the transcripts, summarising key themes for each question. A second researcher reviewed 10% of the transcripts, comparing themes and broadening them where appropriate. These are summarised below together with representative quotations.

Work Stressors
The main stressors at work that were mentioned were the organisational pressures put on staff through having fewer resources yet larger workloads. The nature of the work itself was a large stressor, such as having to work busy shifts for long hours with few breaks. The unpredictability of the work and the traumatic incidents faced were also sources of stress.

"Um. Probably I guess just really traumatic calls that can come in, they're not as often as you'd think, so maybe one in 20 or maybe even more than that, are really traumatic 'cause you sort of get used to it, and when you're …other people are frantic and they cant really tell you where they are, that can be stressful."

"Erm. It obviously varies from day to day I mean, it's just the very nature of the people that we deal with and interact with on a daily basis and and, some of the situations that we are expected to er, to manage and but on top of that I would say the pressures that are put upon us within the actual police service erm, are, are getting increasingly more difficult, we seem to have less numbers and yet more is expected of us, erm all the time."

Reason for attending a course
Participants shared that their main reason for attending the group and online resilience courses was to gain a deeper understanding of mental health. Participants indicated that they had some personal experience of mental illness, either their own lived experience or a family member or friend had experienced, and they wanted to further their own understanding. Participants also wanted to learn tools to help manage their own and others' stress before it became unmanageable.

"Because I think it would be really good just to have some, some tools that I can use anyway to help me, I get, let go of some things, if they got to me, or ways to rationalise things, I think it's just good practice anyway to have, have, and also talking to other people as well because um, there's a bit of a, well not so much anymore but there can be a bit of a stigma that if you do this job you've got to be a certain way and you cant let certain things get to you and um, that's not the case at all. But talking to other people about it has been really great, so I was looking for that."

"Er I myself was put in quite a high risk arena of policing, I was um, positioned two days a week in a specialist behavioural school which actually housed about, well, 200 predominantly boys aged 11 to 16 which suffered all sorts of behavioural difficulties and learning difficulties autism, ADHD, ADD, OCD but basically they had all been, if you like, taken out of mainstream school and put into specialised education section due to their behaviour and difficulties that they faced. The idea was to break down barriers and so it would be there for the kids but also you know investigate anything the school wanted investigating as you could imagine the very nature of the problems that it takes, that you know, crime did occur in the school, against staff, against the school property, against each other you know that kind of thing and that in itself was very stressful role, very enjoyable and rewarding role but very stressful in the sense that some of the home lives that these children lived in and the kind of problems that they faced on a daily basis was horrific, it's almost unspeakable uh, and not that it excuses some of the behaviour but you can, it does help you understand where that's come from."

"Um I mean it was advertised on our internal system that they were looking for people to go on it and I suppose I've got quite an interest in mental health, um, because my former partner has got quite serious mental health problems, and at the time I signed up for the

course you know, I wanted to sort of find out as much as I could really about that thing because I know we're given training, it really is only a basic level in knowledge, in terms of different mental health disorders and coping mechanisms with difficult situations and that kind of thing and I suppose, apart from that I kind of wanted to be able to evaluate my own mental health and coping strategies, 'cause as I say whilst I don't think I'm a particularly stressy person, I'm sure there are occasions that I am and I don't really realise it."

Most liked part of the course

The aspect of the resilience course that participants liked most were the trainers. They valued having independent, non-judgemental course facilitators. Participants also liked the informal, safe and confidential environment, the face-to-face contact and having a mix of people from different services. A few participants mentioned that they preferred a smaller group. Participants who took part in the online condition really liked the content of the topics and felt it gave them a good understanding of mental health problems.

"Um, I liked the, the people that did it, I thought they were really nice ladies, really, you know, really really nice to get to know and it was a really small group I was in as well and initially I wasn't sure about that but actually as we got going it was sort of, I don't know about making friends, that might be a step too far 'cause obviously it's only six weeks but we were very able to talk to each other after only about a week because it was such a small group."

Least liked part of the course

There was no consistency between aspects of the resilience course that participants did not like. However, a few participants made comments that the case studies could have been more realistic and that the trainers could have had a better understanding of the emergency services. Participants also revealed that it could be daunting to share personal information about yourself in the first session. The online course was criticised for being too impersonal and isolating; some participants wanted to have taken part in a group.

"Erm I suppose the only thing I can really think of was that sometimes when you used scenarios sort of practicing tools we've been taught and sometimes it felt a little bit strange, so perhaps I felt it might have been better if the group could have come up with some actual real examples which made it a little more real for us."

Most remembered part of the course

Participants tended to remember the circles of concern and influence as being one of the main techniques learned on the course. Other techniques were the relaxation and breathing exercises and the cognitive cycle.

"Yeah yeah, and also I think it was the, I think also coming in for the circle of influence as well, I thought that was quite um, er I definitely remembered that one in terms of um, you know sort of having you know, identifying problems and things like that and what my influence is over is what I can and can't do and then sort of making a judgement on that based on what I can or can't do on it."

Use of Tools After the Course

Participants generally said they used the tools after the course had finished although overall they appeared to struggle to give concrete examples.

"Yes no certainly um, er I guess a recent one um, I mean even though er I know, when, when sort of joining the courses they did sort of mention that these um, that these sort of patterns and ways of thinking and more for minor situations but I have um, I split up with

a long term, boyfriend um, at the beginning of the year and we had been together for five and a half years um, and so that was a very hard situation for me but in terms of um, in terms of my thinking of, er you know what's happening now I think It's been quite useful to use, um especially like the circle of influence that I cant influence certain specific decisions that other people make in terms of relationship and um, you know I can only sort of influence what I want and then for myself, I think it has been really useful um, in such a situation that's you know not a very nice one if Im honest ."

"Um, er I guess so in terms of um, you know like when we have um, workloads and you know quite high workloads, we've just recently had a lack of resourcing in our team and which has required us to take on a lot more work and also like a few absences from the team um, so I feel like you know Im able to sort of um, openly speak to like my manager and things like that and recognise that Im not coping um, with the, with the work and sort of challenging that to them you know because I dont want the situation for myself to get worse and you know actually thinking about myself rather than trying to you know help out everybody else I think that's been um, you know it's quite useful to actually think of myself."

"Um Ive gone back to, kind of reminded me about some of the breathing exercises and I was taught them years ago and um, Ive used them occasionally again when I feel like my mind is a bit busy and I need to get to sleep and that kind of brought that back to the forefront, so that's, that's been really useful and Id forgotten that I can do that and it helps."

Previous stress management techniques

When asked what participants usually did to manage stress before the course, the majority tended to say they exercised. A few people explained that they would isolate themselves from others, use alcohol, or 'just get on with it'. A few people felt able to talk to friends and family when feeling stressed.

"Um, I exercise, I swim or I run and that's my uh, my biggest escaping mechanism to be honest."

Personal benefits of the course

Since being on the course, participants tended to feel more self-aware and able to recognise their warning signs for stress. They felt less judgemental of themselves for feeling stressed, more able to address issues directly and ask for help when needed.

Before the course many participants already felt able to reach out to friends, family or colleagues for support when feeling stressed. However, they felt more able to do so since taking part in the course. They also gained a better understanding of support services available to them, particularly in the online condition. Two participants even set up an informal coffee-club within their services to encourage peer support related to mental wellbeing.

"Yes yes I think, I think I can talk about things that are stressing me out or upsetting me in a much more normal approach to it so actually instead of, well use this for an example, if I want to have a moan about something with somebody, say my mum tries to balance my opinion, I probably would have got quite annoyed previously whereas now I feel I can present that balance to myself so I dont find that I get irritated by people trying to show me everything isnt as bad as I think. Does that make sense?"

"No it's been really good, actually next week on Tuesday we're having a, a reunion for the participants who took part to kind of get together and see how we're all doing and stuff

like that, we're all going for a meal together for the first time since the course finished so."

Participants' definition of resilience
In terms of the meaning of resilience, participants tended to agree that it refers to the ability to cope with whatever life throws at you. Wellbeing tended to be explained as the act of looking after yourself physically and mentally, and being happy.

"Yeah I mean I guess for me resilience sort of means, I guess for me means things like having things you know in place to sort of feel whole and to make you feel well in yourself if that makes sense."

Dealing with difficult situations since the course
The main way that people felt they would handle difficult situations in the future at work is to take time out to look after themselves. This was consistent across both conditions.

"Yes yes I think, I think I can talk about things that are stressing me out or upsetting me in a much more normal approach to it so actually instead of, well use this for an example, if I want to have a moan about something with somebody, say my mum tries to balance my opinion, I probably would have got quite annoyed previously whereas now I feel I can present that balance to myself so I dont find that I get irritated by people trying to show me everything isnt as bad as I think. Does that make sense?"

Suggested changes to organisations
When asked what changes they would like to see in their organisations, participants suggested more support and training surrounding mental health. They also suggested including the blue light resilience course in staff induction.

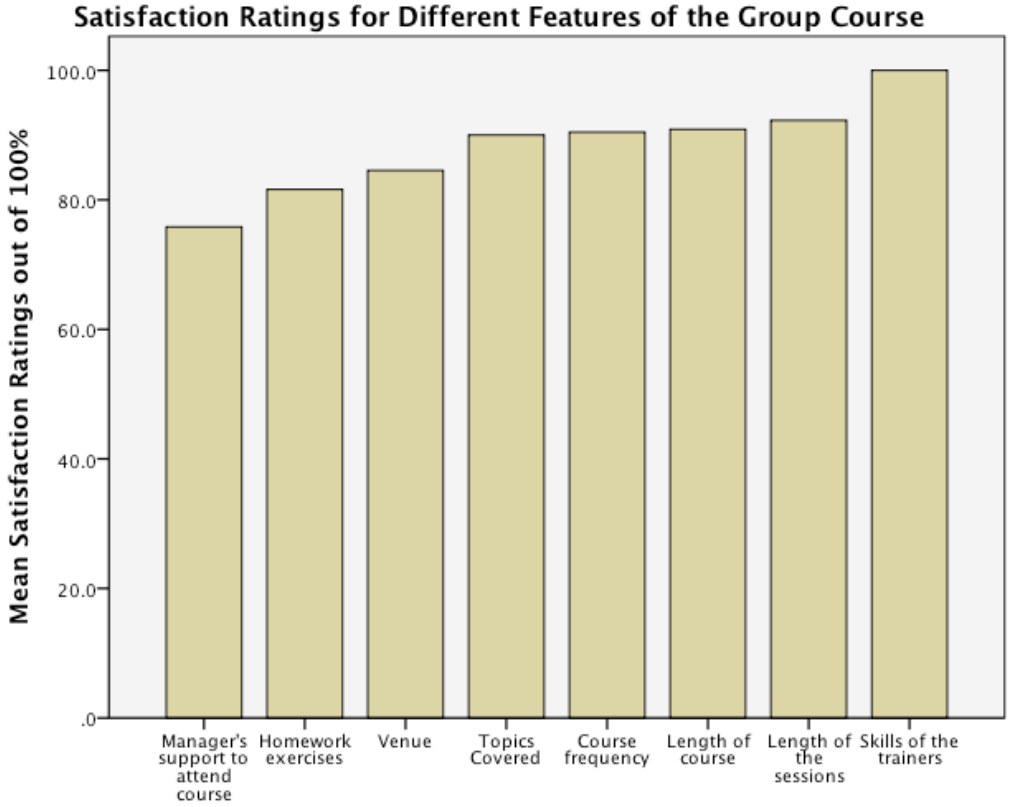
"I dont think we get enough education and support around you know, the stresses that we have and its a hard one and the fire and the police ... nothing really prepares you for it. Erm and you know, like the …and stuff, it wears you down and you dont even know its happening. I think you know at induction sort of stage front line staff attended the course with you know similar content in it, it would just prevent so many issues happening later on in people."

Most important feature for a future course
Participants tended to agree that the most important feature for a future resilience intervention was to break down the stigma attached to mental health. They identified the ability to talk openly about mental health issues as the first step in making any sort of change.

"Erm I think for me the main message needs to be that its okay not to be okay, I think Im, in this line of work in that we cant be fallible and thats so not true."

Satisfaction Ratings
Chart 27 shows participants' satisfaction ratings for different aspects of the group course.

Chart 27



Participants also rated their preference for potential topics to be covered in a future resilience course as well as different possible formats (Charts 28 & 29). Participants also made their own suggestions for topics. These included how to deal with addictive behaviours, such as gambling, PTSD and stress, mental health problems, and overstepping boundaries as well as learning more about exercise.

Chart 28

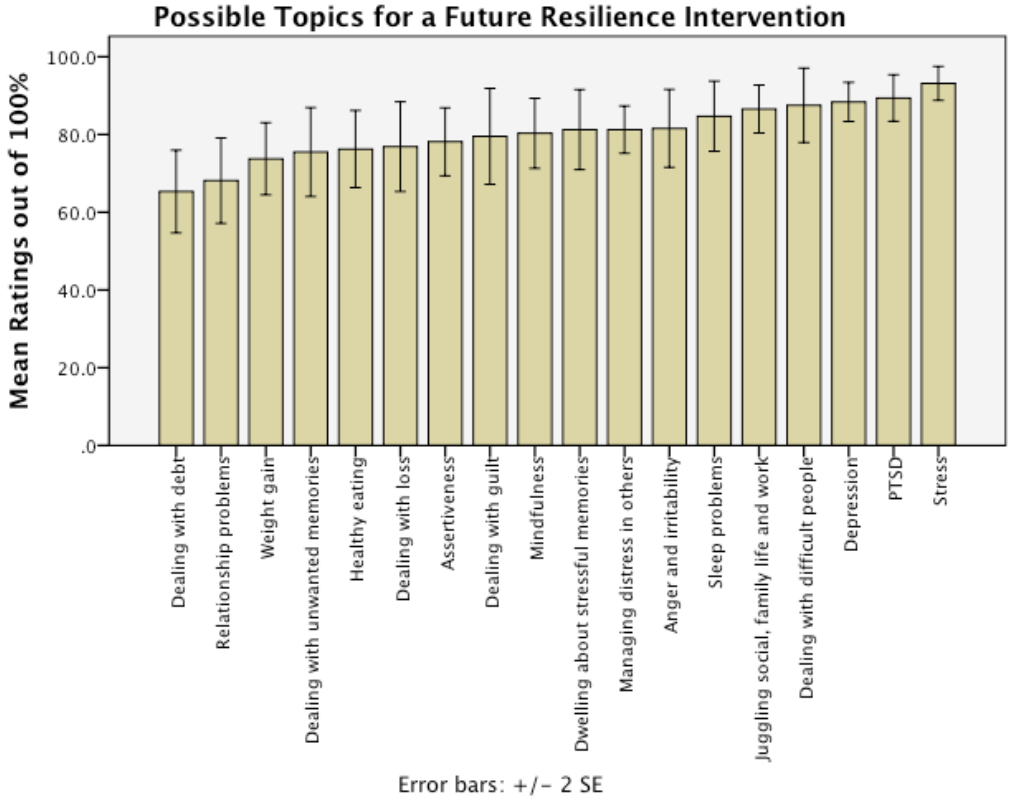
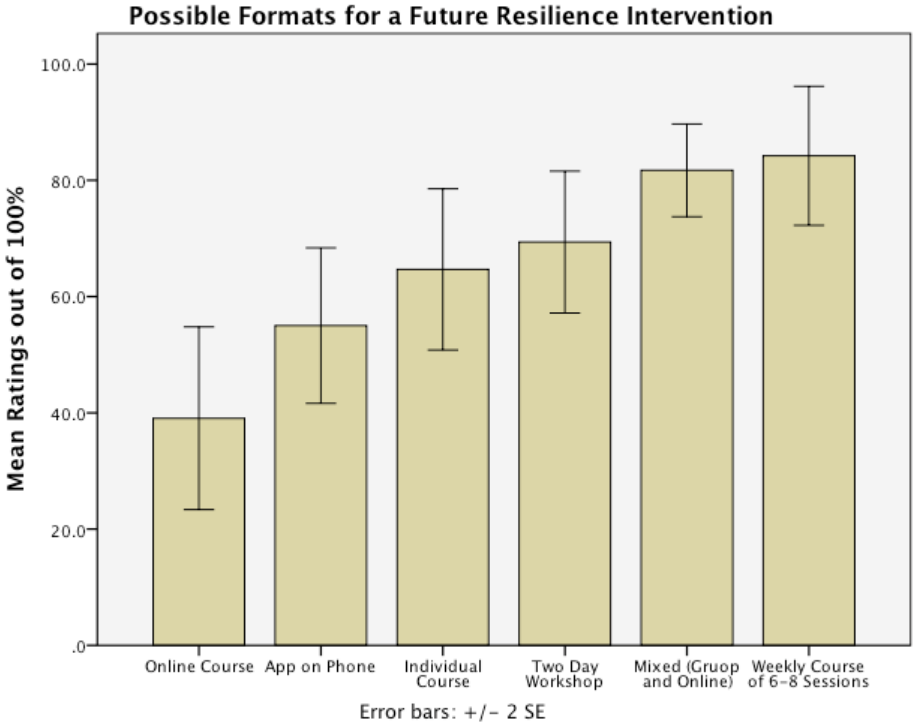


Chart 29



Trainers

Eight trainers (7 women, 1 man) were randomly selected from the trainers who had delivered the group courses. The mean number of courses that trainers had facilitated was 2.38 (SD=1.19). The mean number of years of experience delivering courses was 8.38 (SD=7.53).

Overall, feedback from the trainers was positive. They enjoyed delivering the course and found the protocol easy to use. A couple of trainers reported that the course helped to remind them to look after their own resilience and wellbeing.

Suggestions to improve the delivery of the course
A number of changes were suggested to improve the delivery of course. The first two weeks felt very slow, and it was suggested that they could be combined into one session or bulked up with more content. Slight changes to the structure of the course were also suggested, such as introducing some of the techniques from sessions four and five to help engage participants earlier on and overcome the slow pace of sessions one and two. The case studies were highlighted as feeling repetitive and not true to real life, which corresponds with what participants identified. An important factor picked up by the trainers was the size of the course. It was thought that a large course could significantly impact the dynamics of the group; one suggestion included having a course size of 12 participants per group.

Support via Supervision
The trainers felt that they were well supported to deliver the course. They valued the supervision with Shaun Goodwin and felt it was important for this contact to be available for future courses. Several trainers suggested having peer-to-peer support between different Local Minds so they could learn from each other.

Administrative workload
The administrative work between each session was noted as time-consuming and various trainers felt they could have had more support in sending the trackers and audio recordings to the University of Oxford. They also would have liked to have had more signposting information available towards the end of the course.

Most helpful resources from Mind
The most helpful resources from Mind, the trainers felt, were the protocol and the blue light resource packs including leaflets and posters. Trainers drew on their Local Mind for signposting information and identified, as above, that they could have been better supported in offering this information to participants.

Recommendations for the future
In terms of recommendations for the future, the trainers did not identify any particular resources, training or supervision needs. A few suggestions, however, included having an internal website that the they could refer to for more information, having longer training for trainers and having it nearer in time to the start of the courses, having more local resources for participants, and having more information about the wider blue light programme.

Trainers rated a number of potential topics (Chart 30) and formats (Chart 31) in terms of their importance to a future resilience course. They also suggested a number of topics that could be covered in the future: anxiety, fear, and emotional intelligence, signs of stress and how to manage stress, dealing with expectations and perceptions, dealing with organisational change, dealing with general change, suicide and grief.

Chart 30

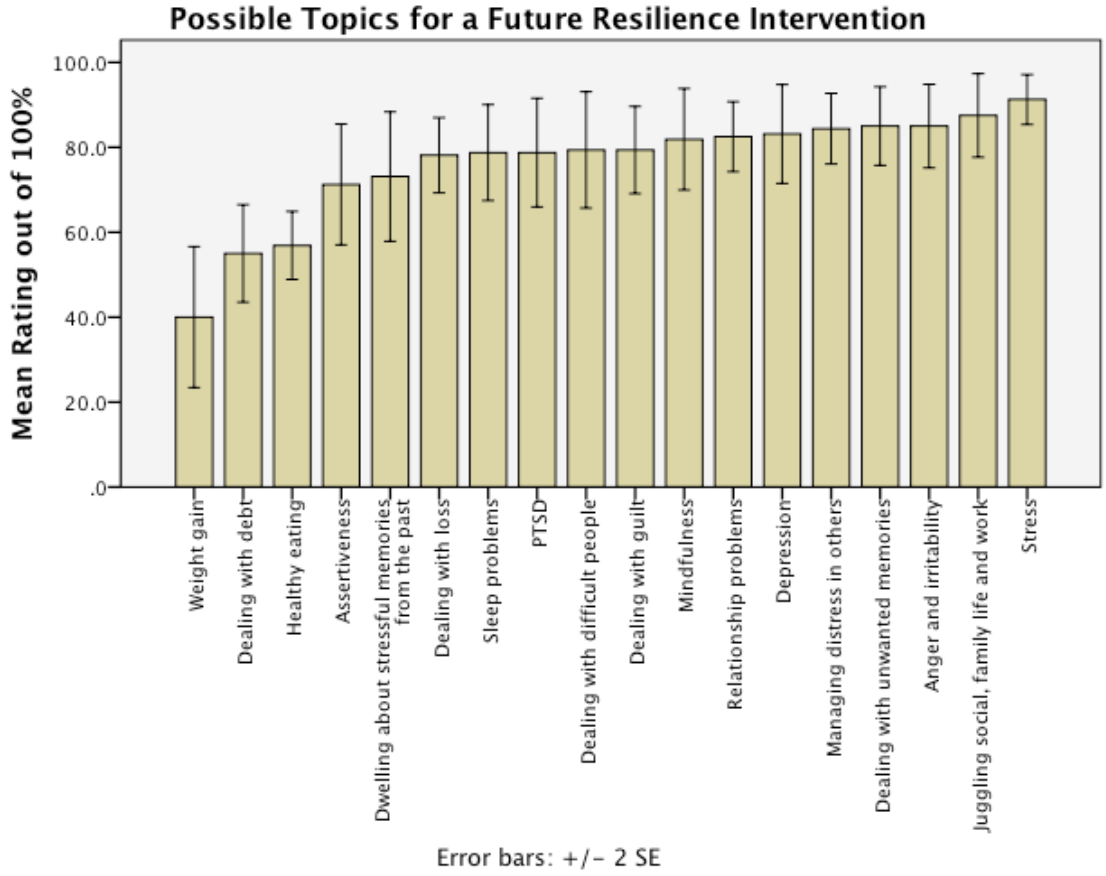
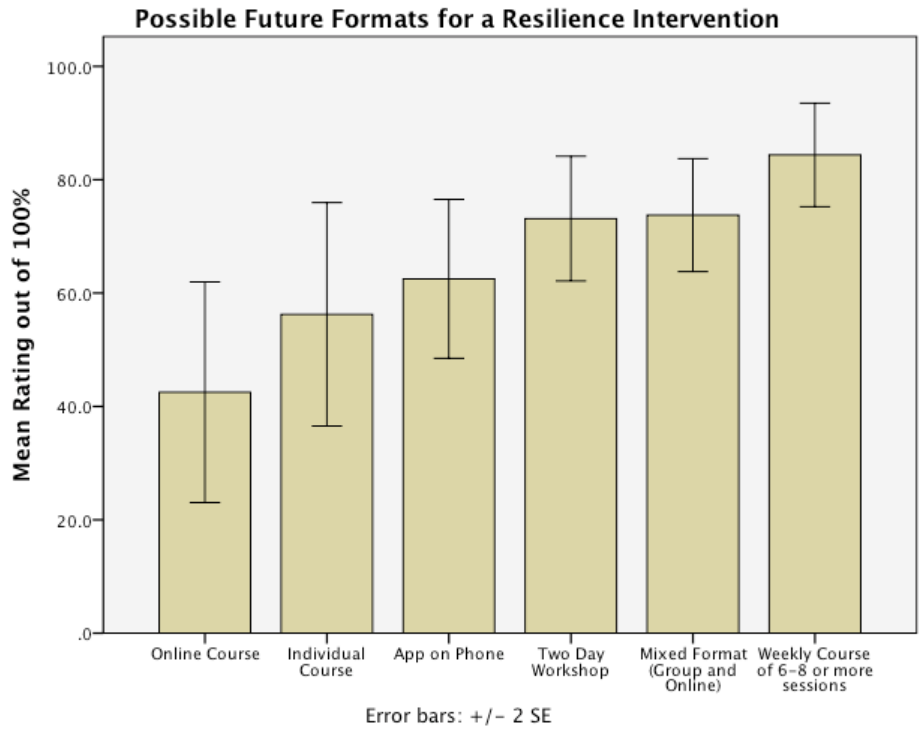

Possible Topics for a Future Resilience Intervention
Mean Rating out of 100%
100.0
80.0
60.0
40.0
20.0
.0
Weight gain
Dealing with debt
Healthy eating
Assertiveness
Dwelling about stressful memories from the past
Dealing with loss
Sleep problems
PTSD
Dealing with difficult people
Dealing with guilt
Mindfulness
Relationship problems
Depression
Managing distress in others
Dealing with unwanted memories
Anger and irritability
Juggling social, family life and work
Stress
Error bars: +/- 2 SE

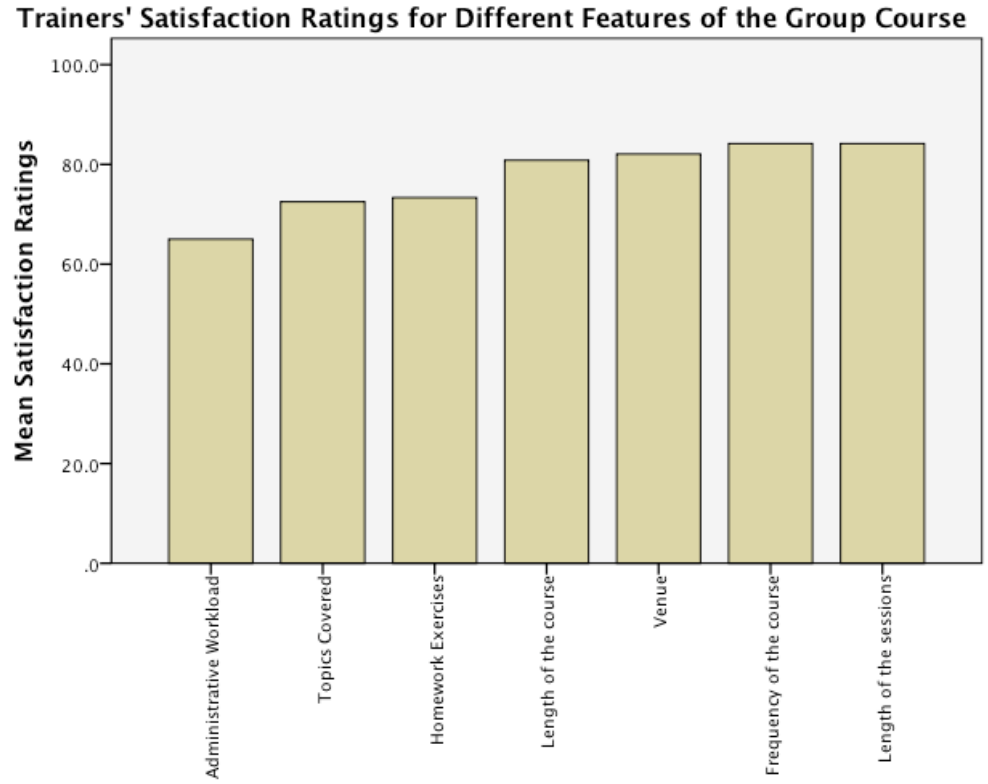
Chart 31



Satisfaction Ratings

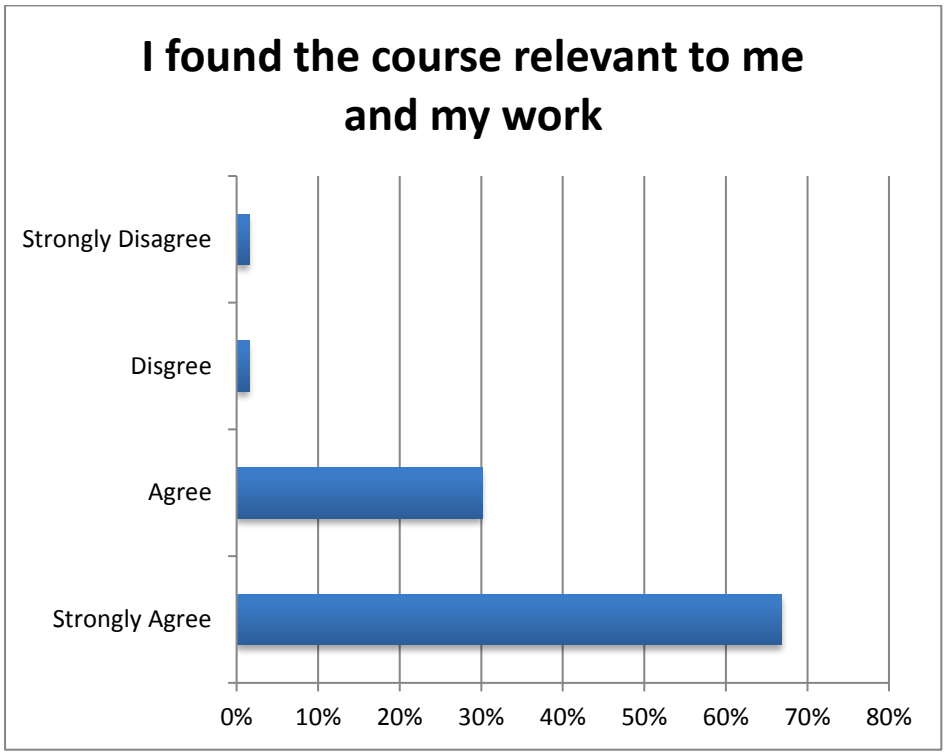
Trainers gave satisfaction ratings for different features of the group course (Chart 32).

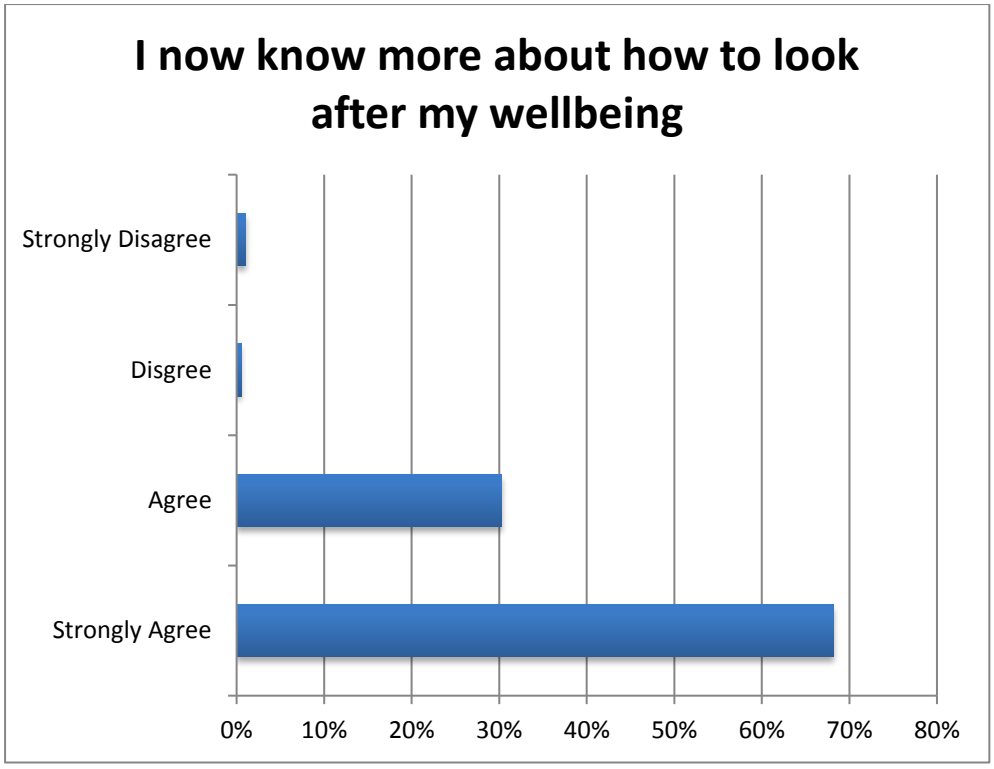
Chart 32

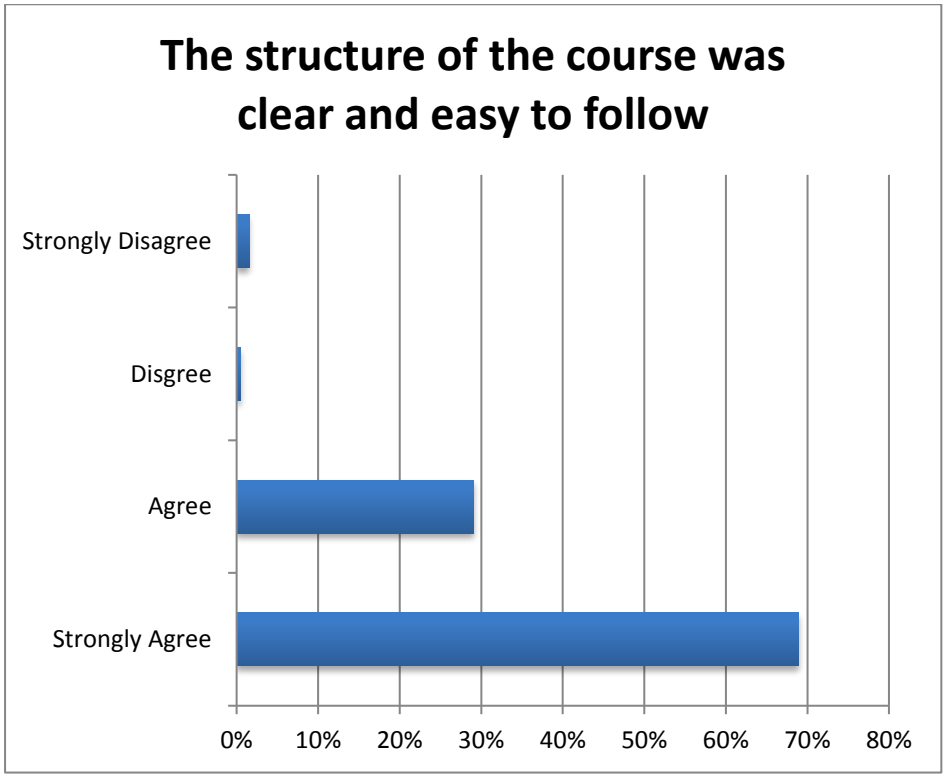


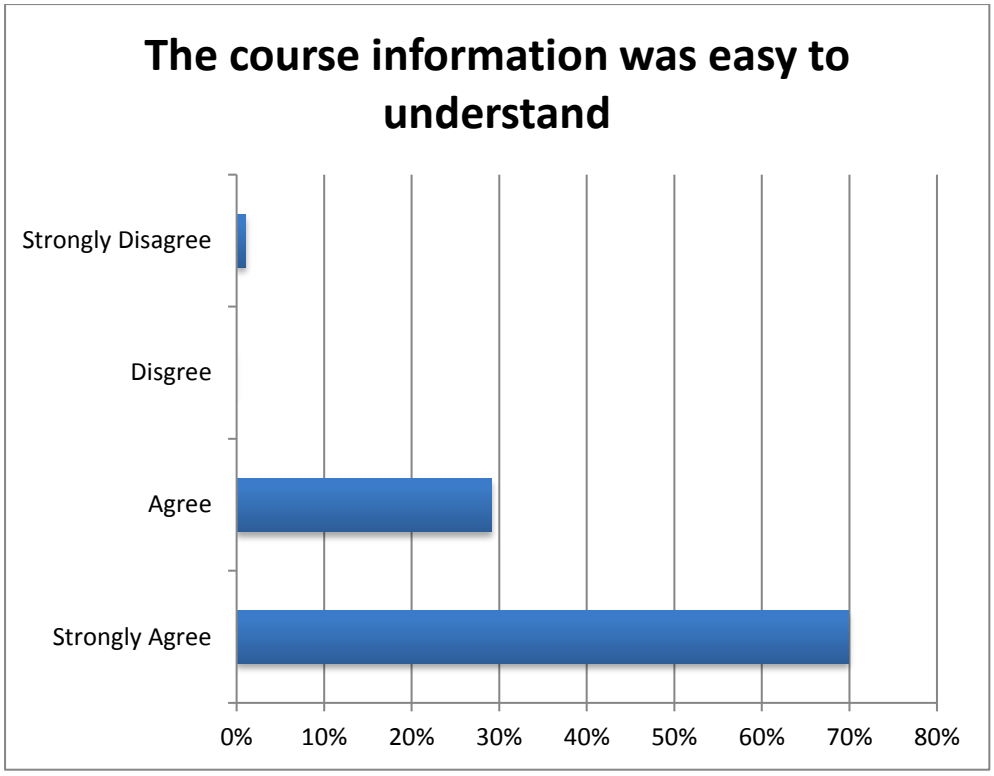
Analysis of Feedback Forms

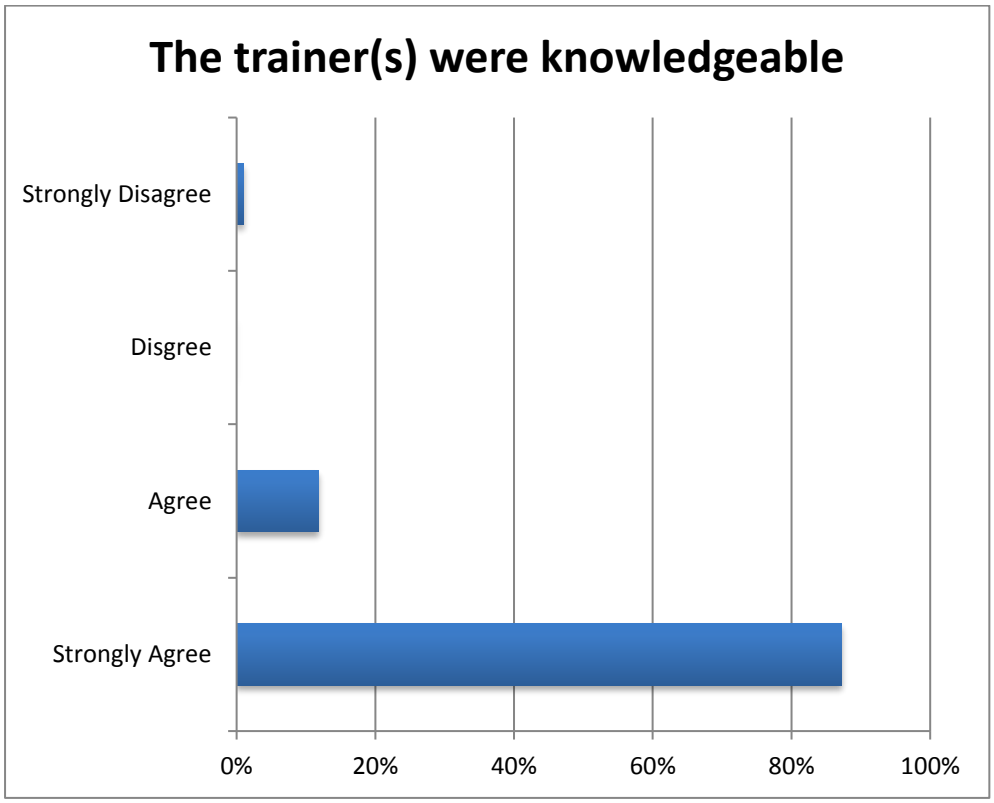
A total of N=196 participants completed a feedback form in their last group session. The form included ten questions, which are shown below with the percentage of agreement participants gave for each item.

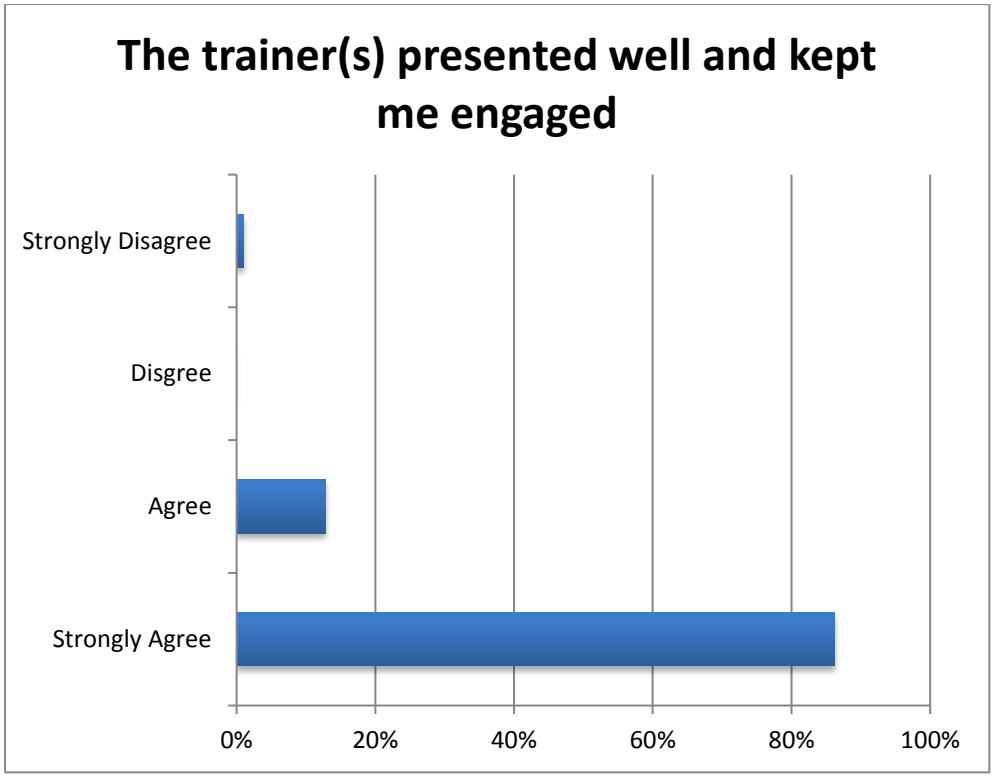


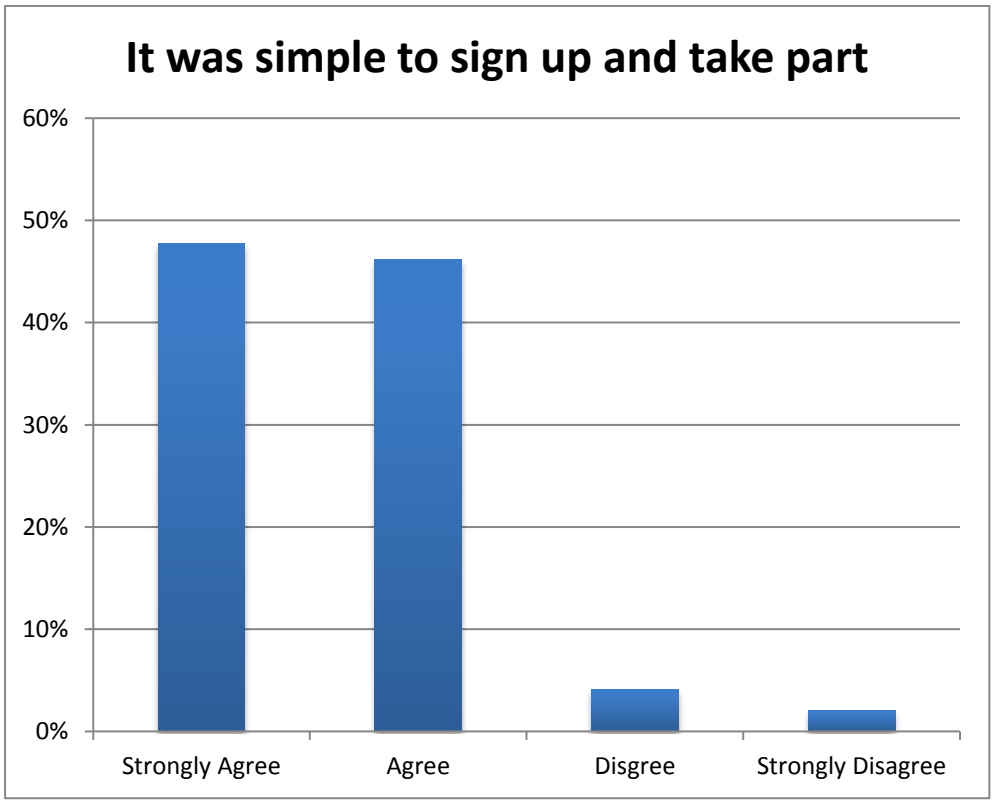

I now know more about how to look after my wellbeing
Strongly Disagree
Disgree
Agree
Strongly Agree
0%
10%
20%
30%
40%
50%
60%
70%
80%

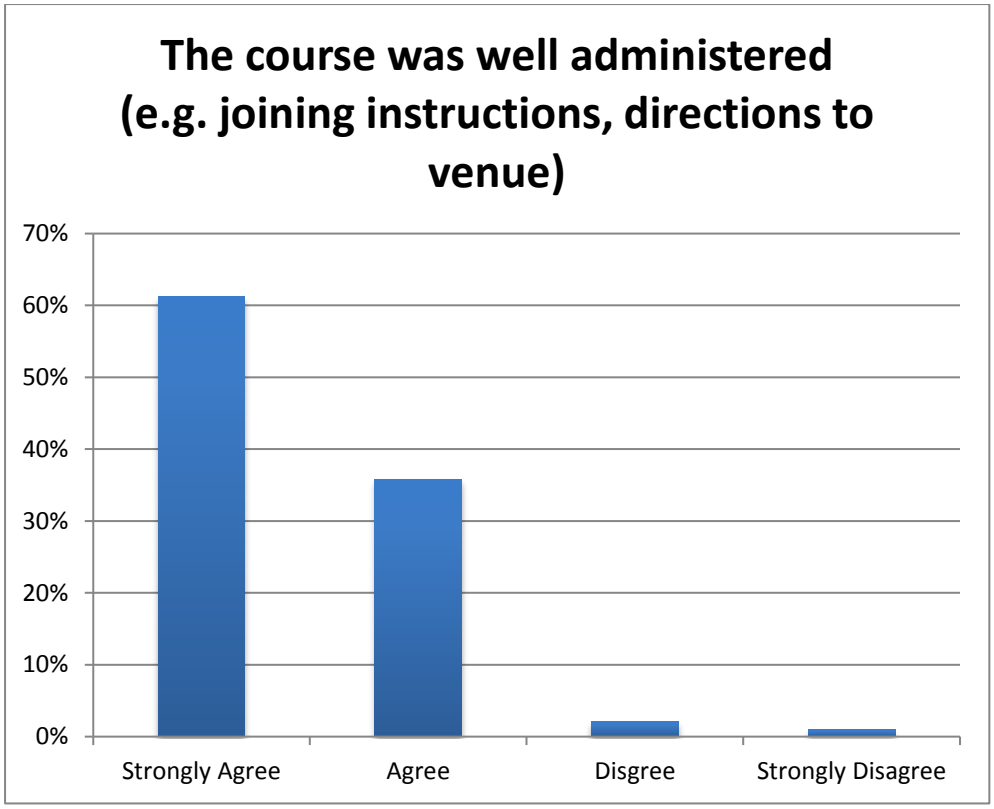

The structure of the course was clear and easy to follow
Strongly Disagree
Disgree
Agree
Strongly Agree
0%
10%
20%
30%
40%
50%
60%
70%
80%

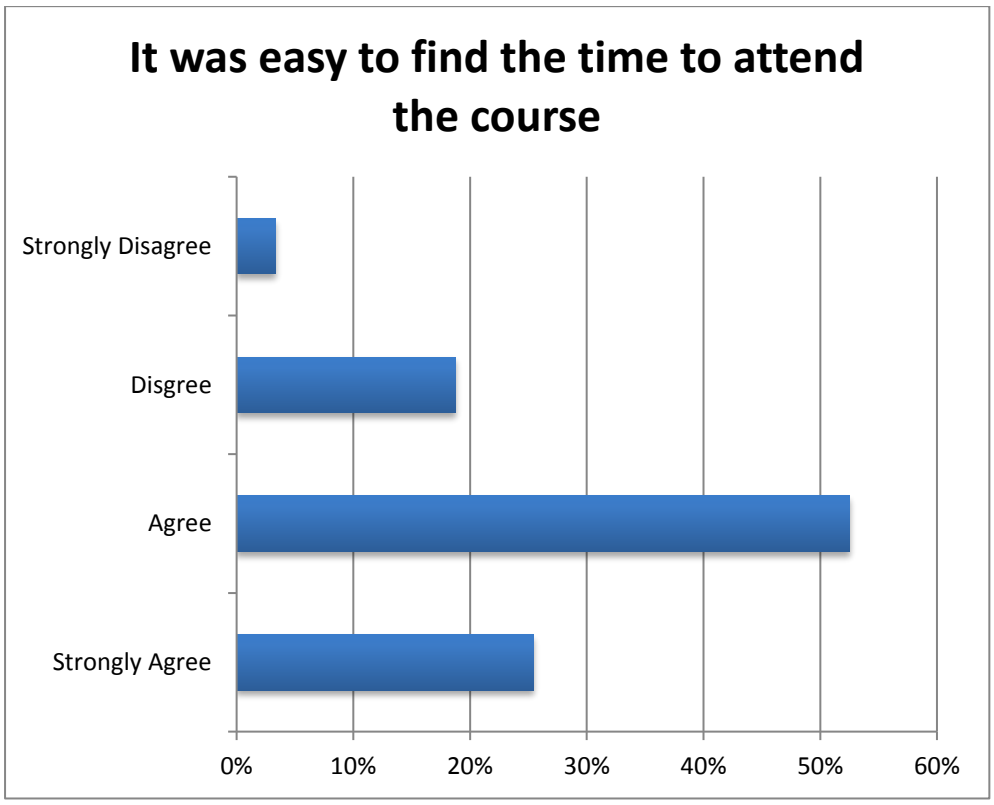

The course information was easy to understand
Strongly Disagree
Disgree
Agree
Strongly Agree
0%
10%
20%
30%
40%
50%
60%
70%
80%

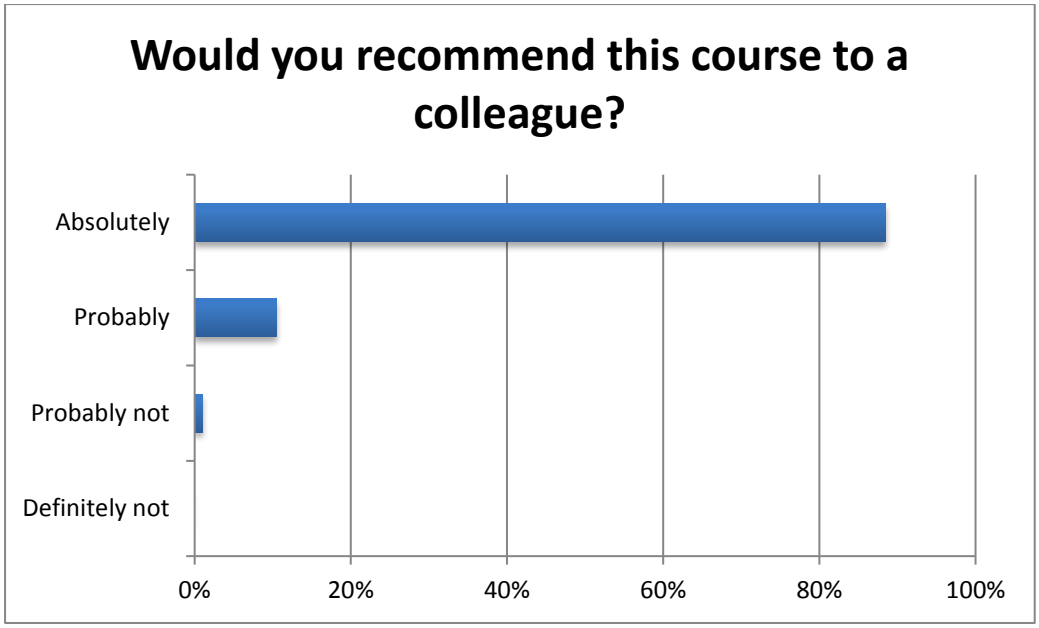

The trainer(s) were knowledgeable
Strongly Disagree
Disgree
Agree
Strongly Agree
0%
20%
40%
60%
80%
100%


The trainer(s) presented well and kept me engaged
Strongly Disagree
Disgree
Agree
Strongly Agree
0%
20%
40%
60%
80%
100%


It was simple to sign up and take part
60%
50%
40%
30%
20%
10%
0%
Strongly Agree
Agree
Disgree
Strongly Disagree


The course was well administered (e.g. joining instructions, directions to venue)
70%
60%
50%
40%
30%
20%
10%
0%
Strongly Agree
Agree
Disgree
Strongly Disagree


It was easy to find the time to attend the course
Strongly Disagree
Disgree
Agree
Strongly Agree
0%
10%
20%
30%
40%
50%
60%


Would you recommend this course to a colleague?
Absolutely
Probably
Probably not
Definitely not
0%
20%
40%
60%
80%
100%

Discussion

Our evaluation set out to determine the effectiveness of Mind's group-based resilience intervention. We conducted a randomised controlled trial in which participants were randomly allocated on a 3:1 ratio to receive the resilience group intervention or the online control intervention. We hypothesised that the resilience intervention would demonstrate sensitive and specific effects. That is, we expected the resilience intervention to lead to greater improvements in resilience, wellbeing, coping and social capital compared to the control condition.

Our aims are set out and discussed below in light of the results. We aimed to:

1. Establish the effectiveness of Mind's resilience intervention

The results revealed that there were no specific effects associated with the group-based resilience intervention. The majority of participants showed no reliable change on any of the outcome measures in either condition. There were, however, a small proportion of individuals who reported reliable improvements in resilience, wellbeing, self-efficacy, social participation, ability to problem-solve, use of social support at home, confidence in managing their mental health, levels of low mood, and frequency of depressive attributions and of rumination. For the most part, these improvements were not seen in the natural wait-list condition, except for improvements in wellbeing where participants who waited for 8 weeks prior to starting a course experienced similar improvements in wellbeing during this period as participants who had completed a course.

Without tracking the natural fluctuations of these outcomes over time in a larger wait-list group, it is difficult to ascertain to what extent improvements are linked to the interventions or to the natural passage of time. Having said this, our natural wait-list group provided some clues about the possible pattern that may be seen over time without any intervention. It would seem that wellbeing does fluctuate over time to a similar level as was seen in the group and online interventions.

Unfortunately, a small proportion of individuals experienced reliable deteriorations from before to after the interventions that could not be explained by exposure to critical incidents, number of sessions attended or topics completed. However, other factors may have contributed to their deterioration, such as financial difficulties or a deterioration in physical health.

2. Isolate the intervention-specific effects from Mind's broader work available to emergency services personnel

Our evaluation demonstrated that there were no specific effects linked to the group-based resilience intervention. Reading the online mental health topics linked to Mind's broader work was as effective as attending the group-based resilience intervention. The majority of participants experienced no change in either condition although a small proportion of participants did report reliable change in resilience, wellbeing, self-efficacy, social participation, ability to problem-solve, use of social support at home, confidence in managing their mental health, levels of low mood, and frequency of depressive attributions and of rumination.

3. Link changes in key outcomes to specific course material to identify the most effective parts of the intervention for further development.

In order to identify the most effective parts of the courses, we first identified the participants who made reliable improvements. We then plotted their weekly resilience, wellbeing and depression scores for the duration of the courses. The results revealed that the sessions linked to the steepest improvements in resilience and wellbeing in the group-based course were sessions 2 (understanding anxiety), 5 (setting goals and challenges, passive anger) and 6 (reviewing learning, planning for the future). In the online course, the steepest improvements were linked to the topics on sleep, mindfulness and PTSD. In terms of the greatest improvements in low mood, sessions 3 (challenging distorted thoughts), 4 (managing worry and stress) and 5 (setting goals and challenges, passive anger) for the group course and the sleep and mindfulness topics for the online course were most relevant.

We also analysed data from our qualitative interviews of participants in both conditions. Participants rated the topics on stress, depression and PTSD as being most important for a future resilience intervention.

Thus, for future iterations of the resilience intervention, it may be important to consider elements of the topics on stress, mindfulness, depression and PTSD as well as material covered in sessions 2 (understanding anxiety), 3 (challenging distorted thoughts), 4 (managing worry and stress) 5 (setting goals and challenges, passive anger) and 6 (reviewing learning, planning for the future) of the group intervention.

4. Identify predictors of success to further develop the intervention for future delivery and to inform future training.

To identify predictors of success, we first identified participants who reliably responded to the interventions on each of the outcome measures. A general pattern emerged in which participants who were most likely to make reliable improvements were also most likely to be more vulnerable at the outset, such as having significantly lower resilience, wellbeing, self-efficacy and problem-solving scores than participants who did not improve, for example. Participants who were most likely to make improvements in mental health outcomes were also most likely to have mean scores that were in the clinical range on the mood and anxiety measures. The baseline measures for depression (PHQ-9), anxiety (GAD-7), wellbeing (WEMWBS) and confidence in managing mental health were the most significant indicators of reliable improvements in mood at post-intervention.

We also looked at participants who were initially excluded because they were above clinical cut-off on measures of PTSD or depression and then re-included into the study after clinical interview established that their symptoms were not causing interference or distress, they did not wish treatment and were not at risk. We compared this group of participants who completed the group or online courses to participants who had been immediately eligible for the study. Consistent with the general pattern described above, participants who had initially scored above clinical cut-off on measures of PTSD or depression were more likely to make significant improvements in resilience, wellbeing, social capital, depression, depressive attributions and rumination. It is possible that the resilience group and online courses may be best placed to support emergency workers who are more vulnerable. Initially excluded participants also had significantly lower resilience and wellbeing at the outset compared to participants who had been immediately eligible.

5. Inform the development of evaluation tools for continued use by Local Minds

We calculated the internal reliability for all of the scales administered in this study. For the most part, the measures performed extremely well. Measures that would warrant review for future use are the brief coping subscales, in particular the subscales assessing behavioural disengagement, denial and self-distraction.

Interpreting the discrepancy between participants' feedback and the minimal change linked to the interventions (group and online)

Although the interventions were very acceptable to emergency workers, the results demonstrated that the majority of participants did not experience reliable improvements in resilience, wellbeing, coping or social capital. Depending on the outcome measure, the proportion of responders ranged from 8% (social participation) to 30.1% (wellbeing). Wellbeing as an outcome measure was associated with the greatest proportion of participants who responded. However, the degree of improvements in wellbeing was comparable to the degree reported by participants in our wait-list condition, suggesting that the improvements in wellbeing were related to the passage of time. The effect of the interventions on all outcome measures was small, which suggests that the group-based resilience intervention in its current form is not cost effective. At best, for every 100 participants treated, 30 will respond with improvements in wellbeing, although it is currently unclear if improvements would be linked to the passage of time or to the intervention.

The findings in this trial are consistent with the results of other evaluations of interventions aimed at improving emergency workers' mental wellbeing. For example, randomized controlled trials (RCT) found that trauma risk management, a peer support system widely available to the police and ambulance services in England (Greenberg et al., 2010) and critical incident stress debriefing widely used by UK fire-services (van Emmerik et al., 2002) had no effect on resilience or rates of mental ill health.

Current resilience interventions appear to be limited in success because they (1) fail to target predictors of resilience or mental ill health (2) are evaluated with measures of resilience or wellbeing, which may not relate well to wellbeing, resilience or coping as they are experienced by emergency workers, (3) do not include follow-up training to sustain gains and (4) do not include strategies that could help emergency workers cope with characteristic stressors. For example, our and others' research has demonstrated that exposure to stressful scenarios through imagery reduces anxiety for police officers (Arnetz et al., 2013) and other at risk populations (Wild et al., 2007; 2008; 2011) yet exposure to imagery of stressful scenarios is not included in resilience interventions for emergency workers in England.

Future resilience interventions will need to be tailored to strengthen predictors of resilience and to modify predictors of mental ill health as well as incorporate measures of coping that are sensitive and specific.

Conclusion

Our evaluation rigorously assessed Mind's resilience intervention for emergency workers in a large-scale randomised controlled trial. Mind's resilience intervention performed similarly to the online control intervention, meaning that there were no specific effects associated with the intervention. Whilst the majority of participants showed no reliable improvements in resilience, wellbeing, social capital or mental health outcomes, a small proportion of participants did respond. Such participants appear to be more vulnerable at the outset,

showing lower levels of resilience and wellbeing and higher levels of low mood at baseline compared to non-responders. Both interventions demonstrated small improvements in outcome measures with small effect sizes, suggesting that the group intervention is not cost-effective. The majority of participants enjoyed the interventions, indicating a discrepancy between their experiences and measurable improvements in resilience, wellbeing, coping and social capital. The limited success of this intervention is consistent with the wider literature. Future refinements to the intervention may need to target predictors of resilience and mental ill health.

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