August 2017 Mindfulness for Health Course Evaluations

Data Collection

This document presents the latest research update of the Breathworks 'Mindfulness for Health' course. Participants on the course were invited to complete a series of online questionnaires measuring a number of variables. Questionnaires were offered at four time points; pre-course, post-course, and then at both a 3 and 12 month follow-up. As questionnaire completion rates varied across participants, sample numbers for each measure may vary.

Data Analysis

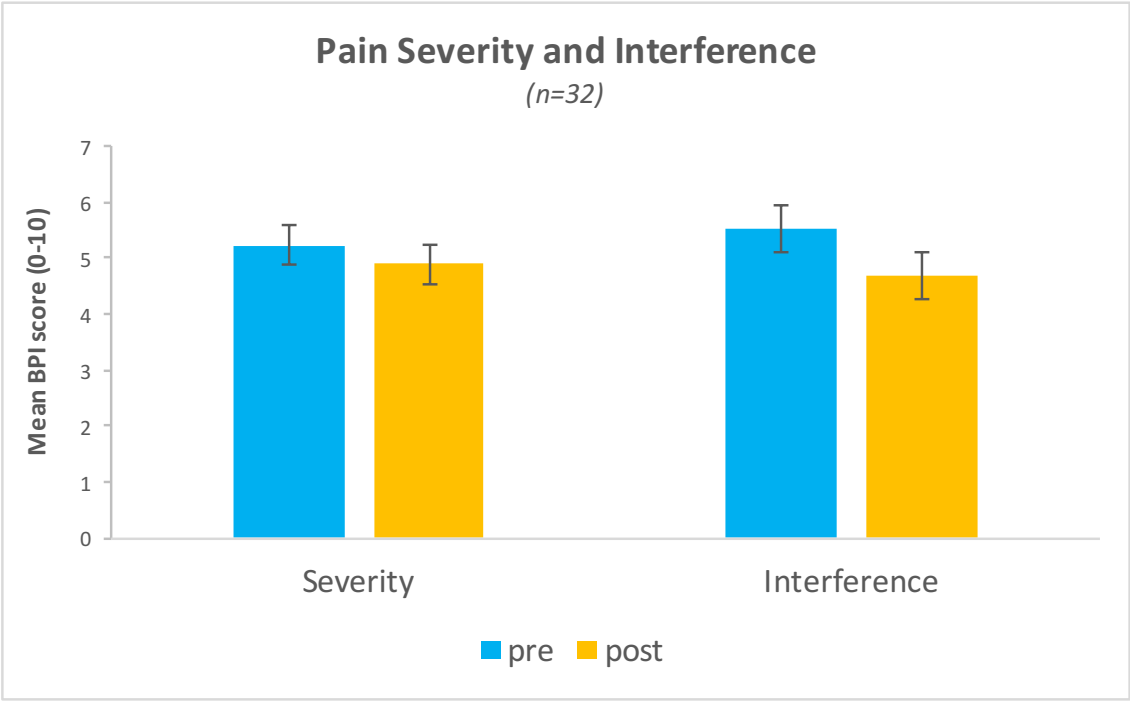
We have analysed our questionnaire data in a number of different ways. To begin with, we performed paired sampled t-tests on the pre- and post-course data to look for **statistically significant** changes in variables. Variables that showed a 'highly significant' improvement were then investigated further by plotting reliable change graphs in order to look at how participants' scores changed on an *individual basis* and also whether such changes were **clinically significant (i.e. has the individual moved from a clinically concerning score to a 'non-concerning' score**.) We also plotted line graphs to demonstrate how the effects of the MfH course were sustained over time.

A Quick Summary of the Findings

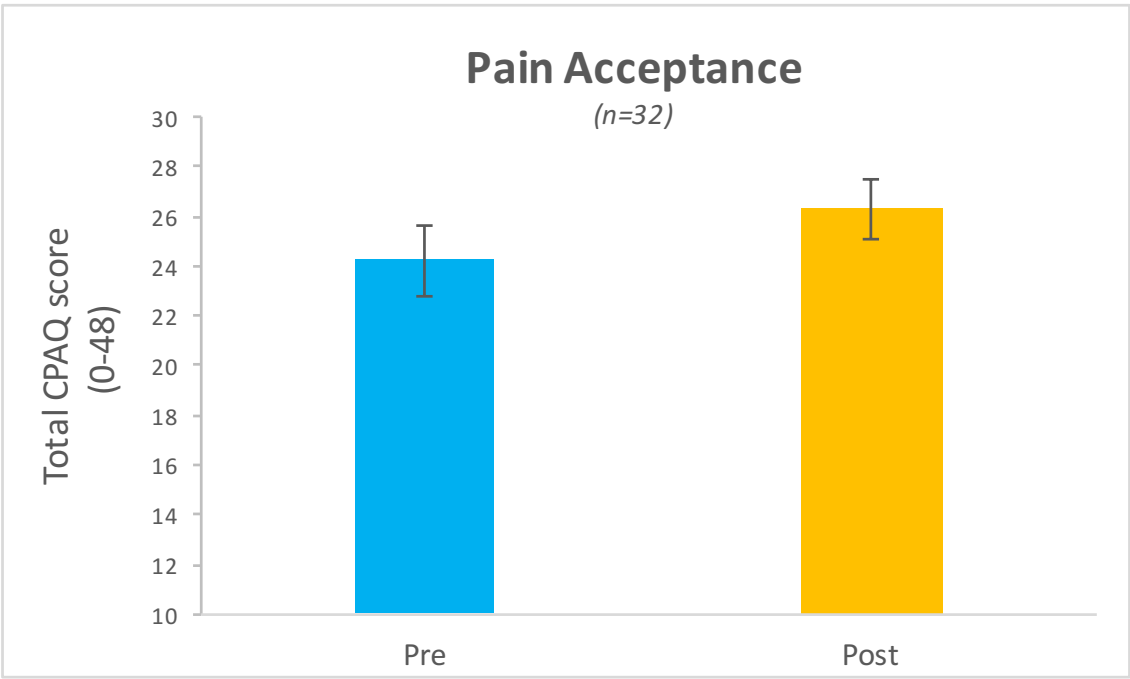
The total sample of participants who completed both a pre- and post- course questionnaire was 79 (65 female and 14 male). 32 of these participants (27 female and 5 male) had stated that they were experiencing chronic pain for the duration of the course, and so these participants were also directed to specific pain-related questions. The remainder of the sample were on the course for other chronic health conditions beside pain, such as anxiety and fatigue. Below is a brief outline of the findings, along with a contents page of where you can find the full detail:

Statistical Significance – Pre and Post Course

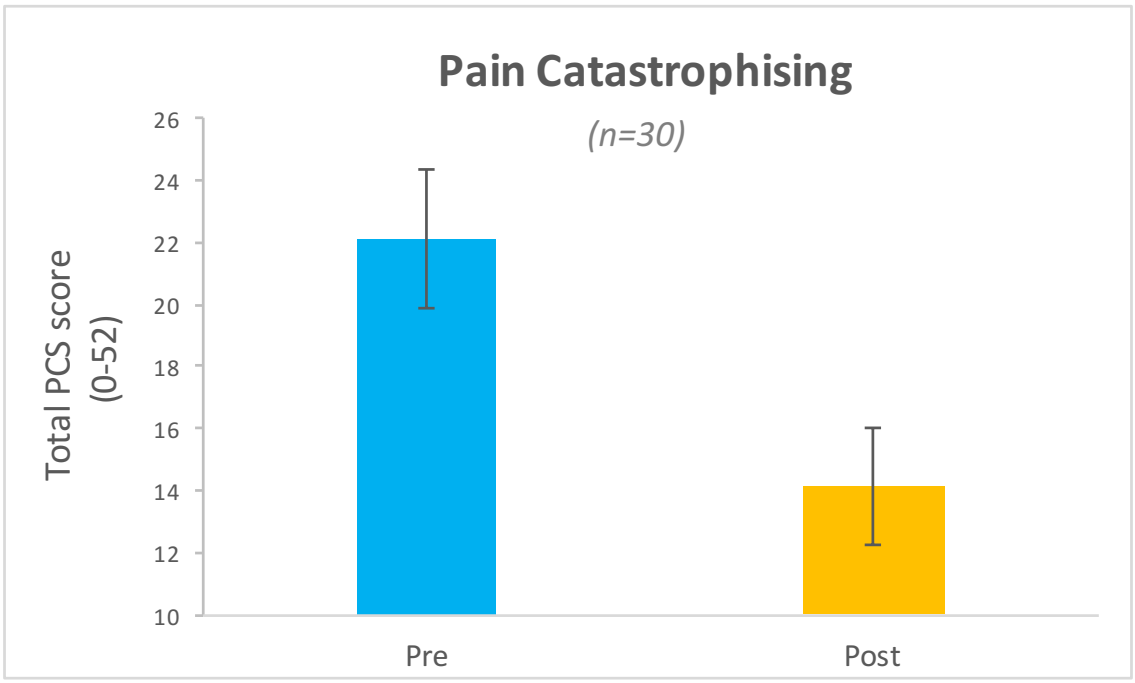
Chronic Pain Sample (32 participants)



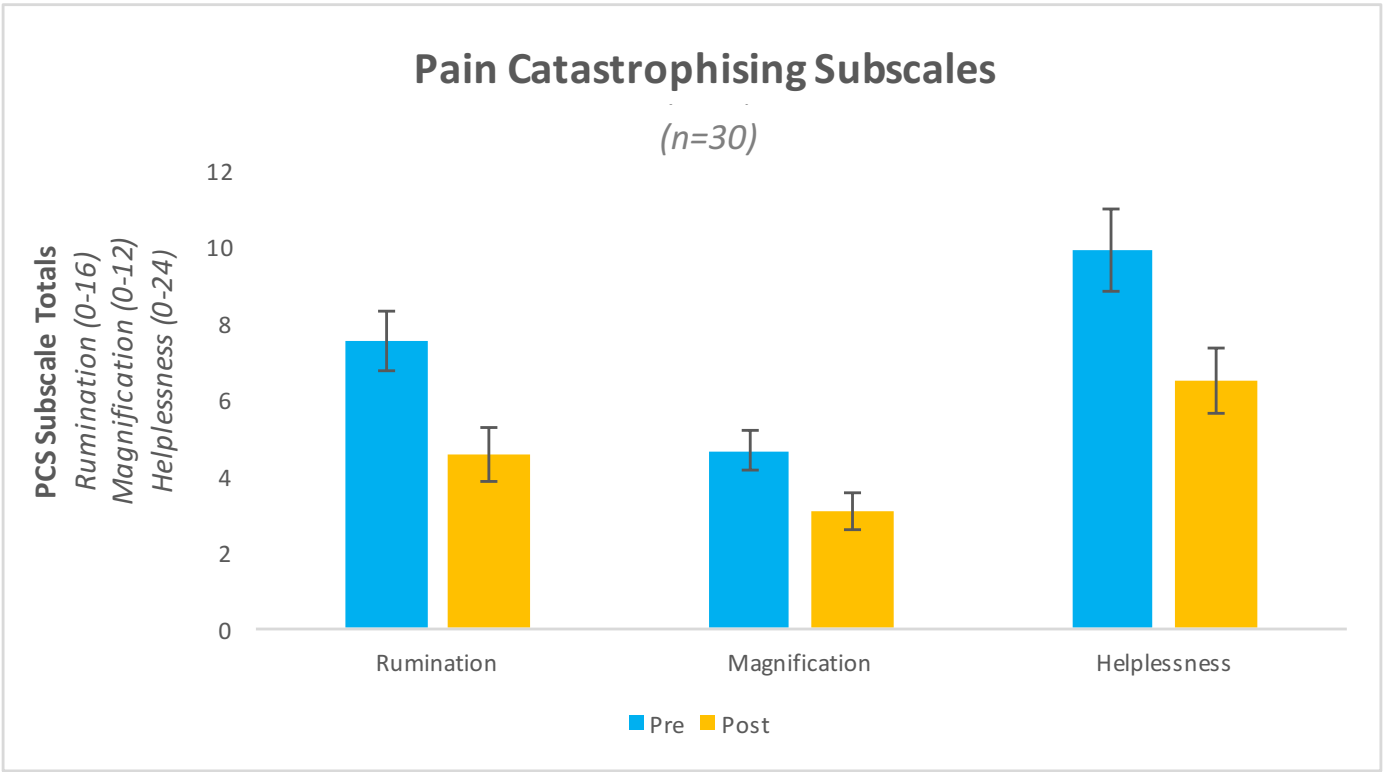
Pain severity and pain interference were measured using the British Pain Inventory (BPI) scale. A total mean score was calculated from several questions, which were measured on a scale from 0-10, with higher scores suggesting higher levels of pain severity and interference with daily life. Despite our results showing a reduction in pain severity and interference levels, we found no statistically significant improvements for either measure (**interference** – $t(31)=1.694$, $p=.100$, **severity** – $t(31)=1.086$, $p=.286$). The effect size[6] for both pain interference ($d=.3$) and pain severity ($d=.193$) was small.



Pain acceptance was measured using the short form of the Chronic Pain Acceptance Questionnaire (CPAQ), where possible total scores ranged from 0-48, with higher scores suggesting higher pain acceptance. Despite our results showing an increase in pain acceptance, we found no statistically significant improvements - $t(31)=1.578$, $p=.125$). There was also a small effect size ($d=-.281$)

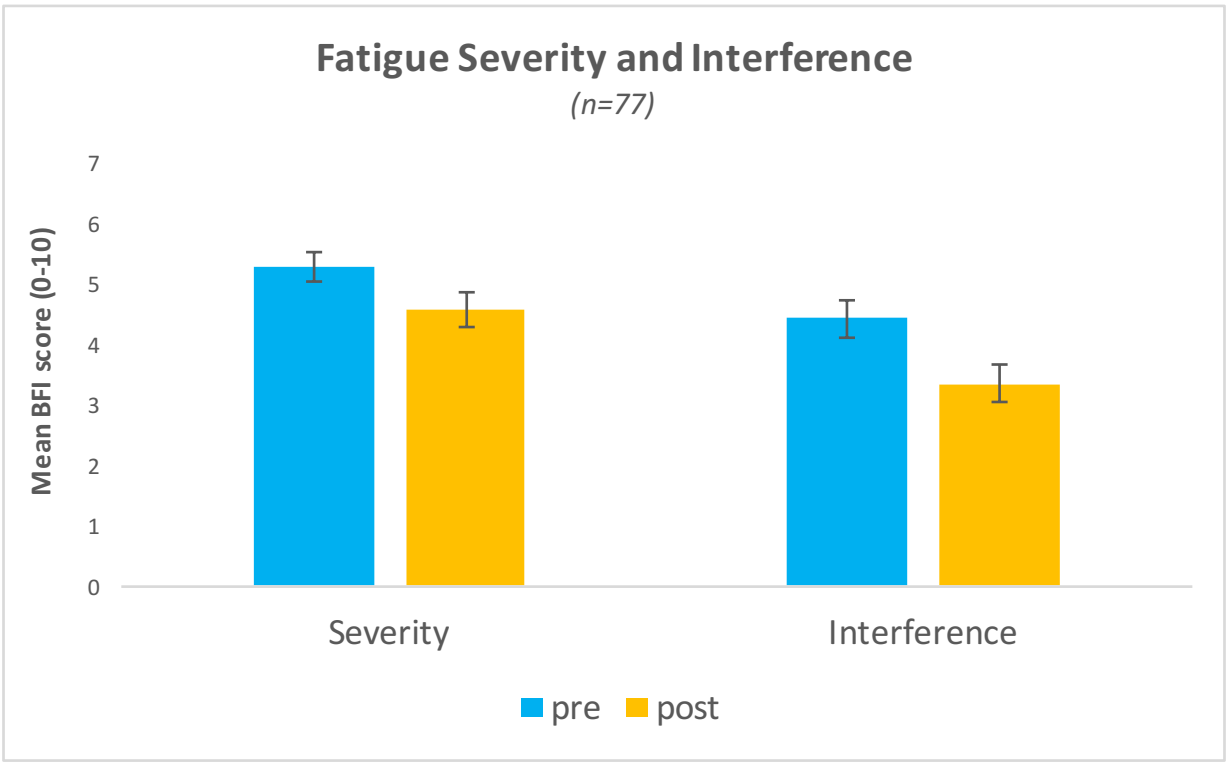


Pain catastrophising was measured using the Pain Catastrophising Scale (PCS), where the total score ranged from 0-52, with a higher score indicating higher levels of pain catastrophising. We found a highly significant reduction in levels of pain catastrophising, $t(31) = 5.084$, p=<.01 and a large effect size (d=.917)

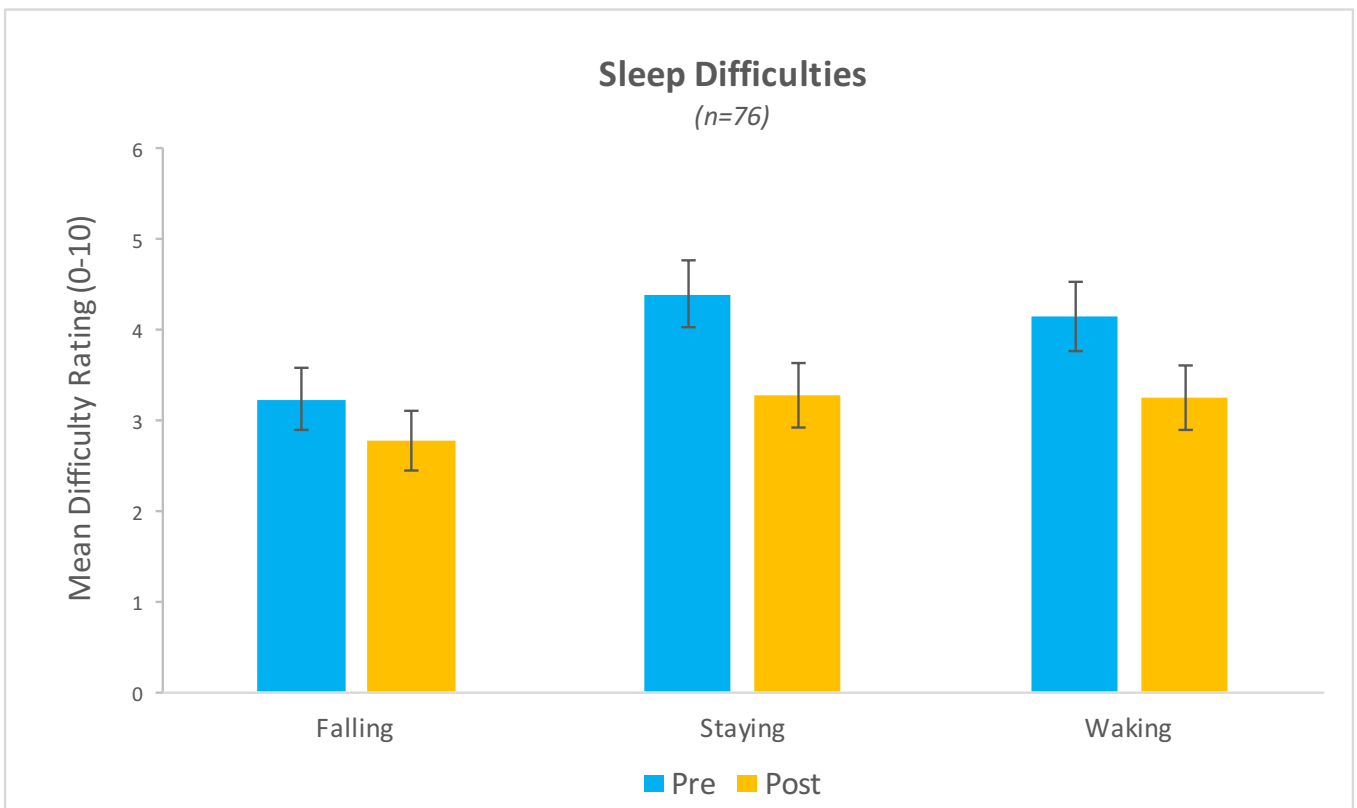


We also found that each individual subscale of catastrophising was highly significant; **rumination** (they ruminate about their pain e.g. "I can´t stop thinking about how much it hurts", $t(31)= 4.816$, p=<.01, **magnification** (they magnify their pain e.g. "I´m afraid that something serious might happen"), $t(31)=4.191$, p=<.01, and **helplessness** (they feel helpless to manage their pain e.g. "there is nothing I can do to reduce the intensity of my pain"), $t(31)=4.396$, p=<.01. **Effect sizes were large for all variables**; rumination (d=.866), magnification (d=.747) and helplessness (d=.813).

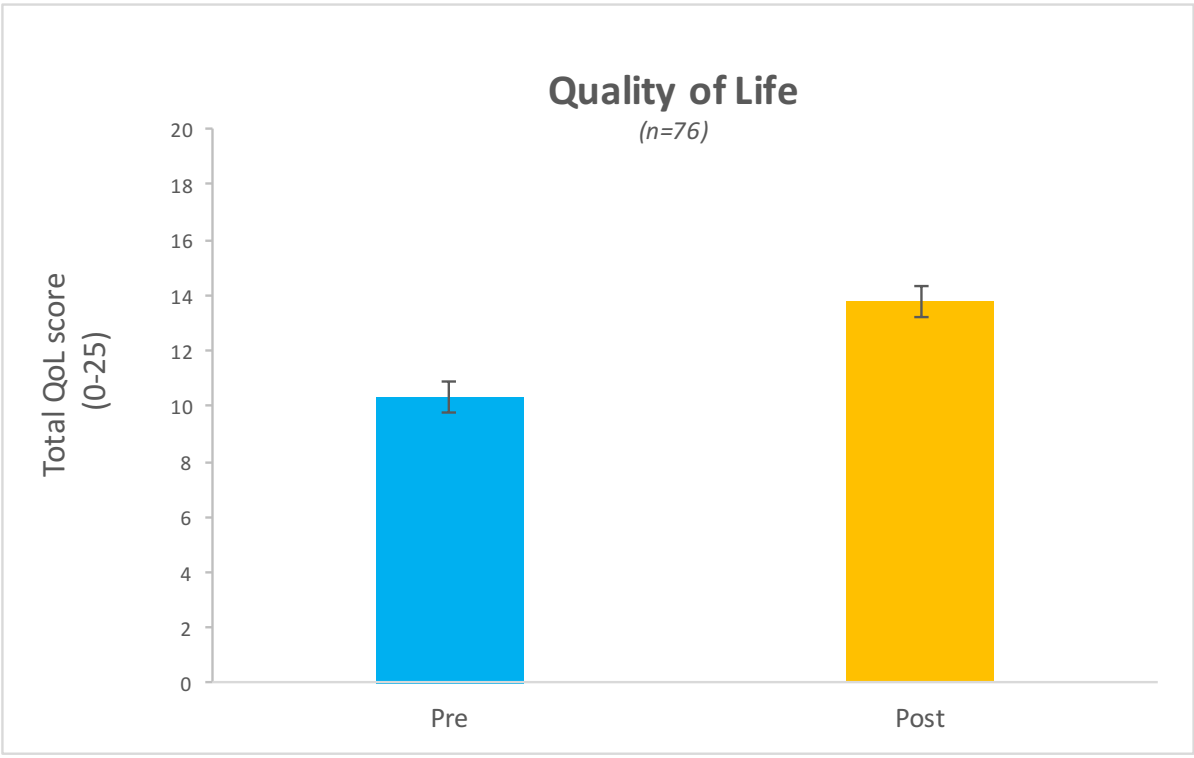
Mixed Population (79 participants)



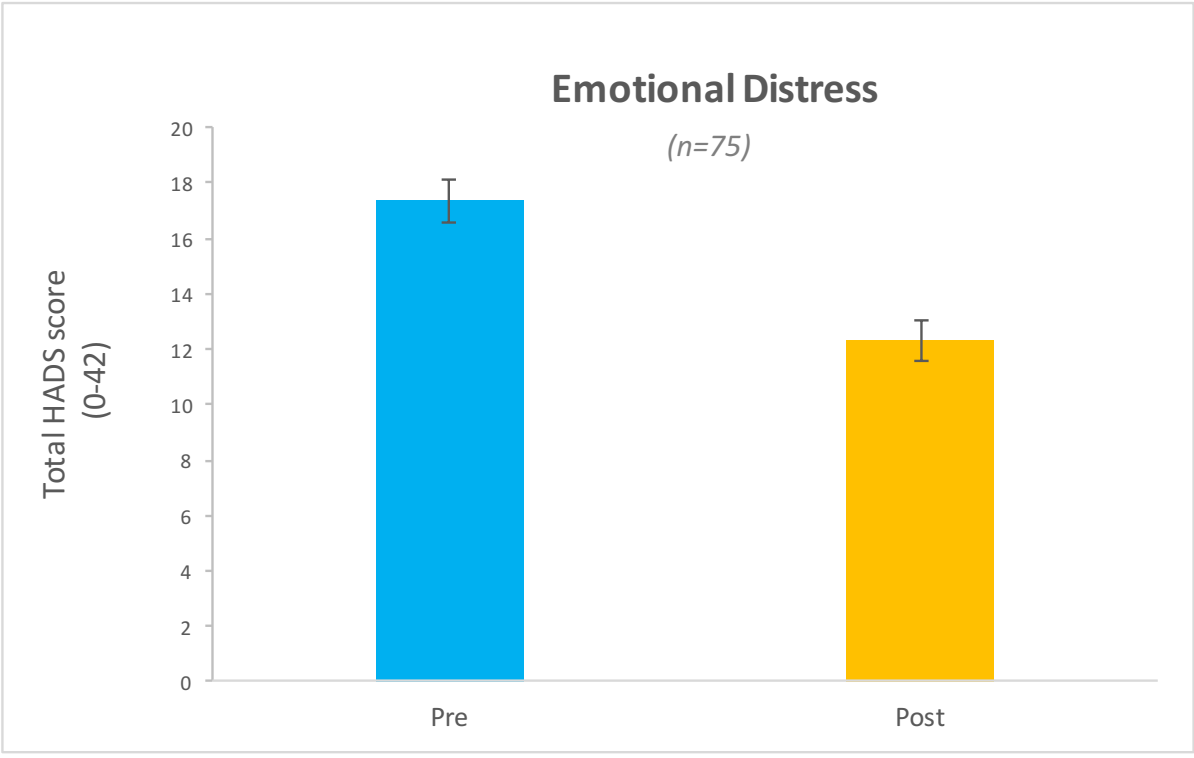
Fatigue severity and interference was measured using the Brief Fatigue Inventory (BFI), where a mean score from several items was computed which ranged from 0-10. Higher scores suggested higher levels of fatigue severity and interference. We found significant reductions in both fatigue severity and interference with daily life, $t(76)=3.063$, $p=<.05$, and $t(76)=3.526$, $p=<.05$ respectively. There was a small-to-medium effect size for both fatigue severity ($d=0.354$) fatigue interference ($d=0.402$).



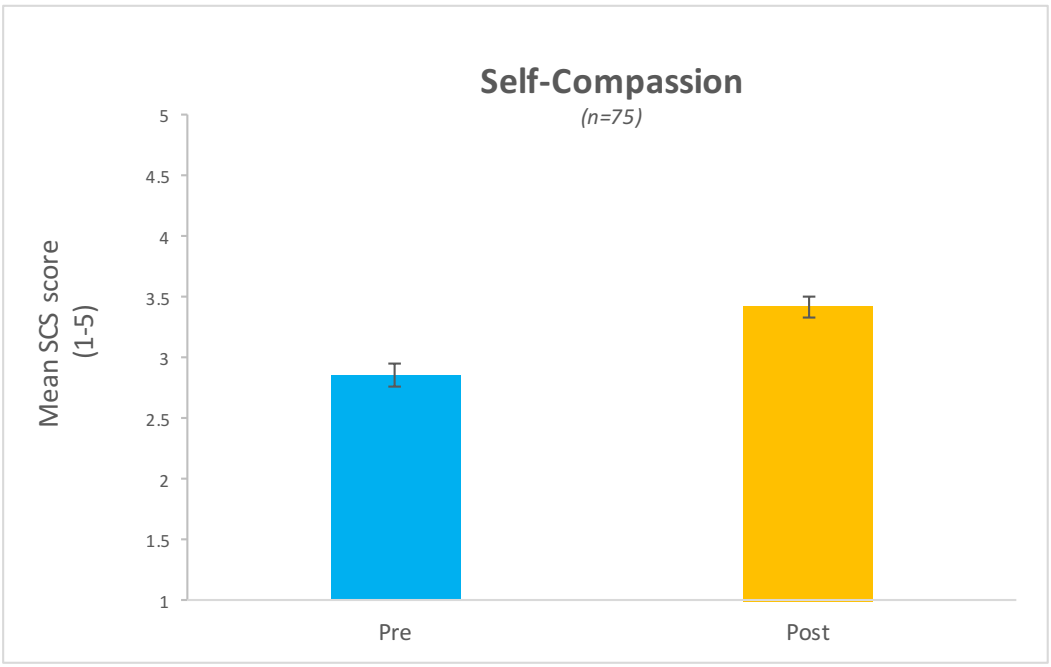
Here higher scores suggest increased sleep difficulties. We found significant reductions in difficulty **staying asleep** and **waking too early**, $t(75)=3.229$, $p=<.05$ and $t(75)=3.108$, $p=<.05$ respectively. There was a small-to-medium effect size for both measures; waking ($d=0.358$) and staying ($d=0.371$). However, despite a reduced difficulty in **falling asleep**, this measure failed to reach statistical significance, $t(75)=1.538$, $p=.128$. The effect size also fell short of small ($d=0.176$).



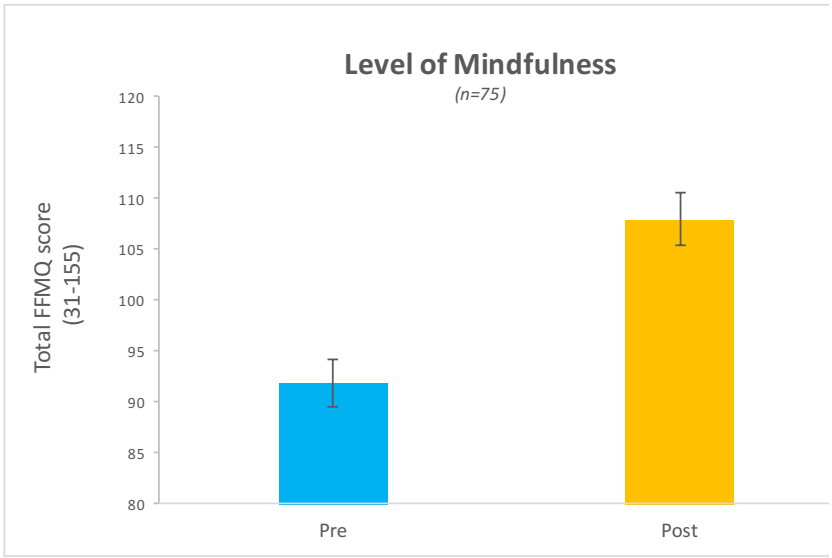
Quality of life was measured using the WHO-5 Well Being Index, with possible total scores ranging from 0-25. Higher scores suggest a better quality of life. We found a highly significant improvement in quality of life scores, $t(75)=-5.641$, $p=<.01$, and there was also a medium effect size ($d=0.648$).



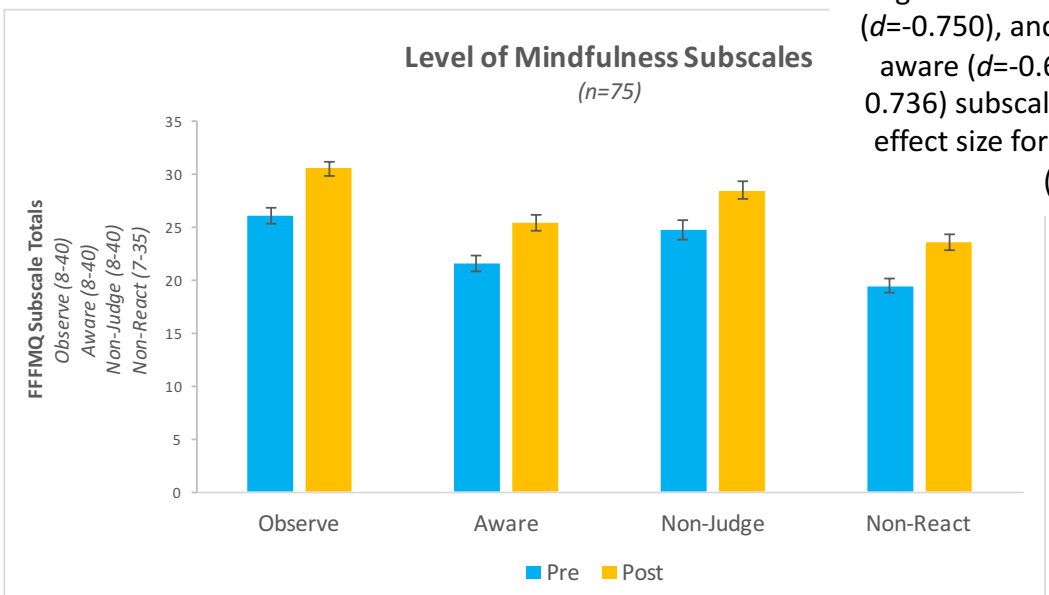
Emotional distress (a combination of depression and anxiety) was measured by the HADS (Hospital Anxiety and Depression Scale) where the possible total score ranged from 0-42. Higher scores suggest higher levels of emotional distress. We found a highly significant reduction in emotional distress, $t(75)=6.938$, $p=<.01$. There was also a large effect size ($d=0.799$)



Self-compassion was measured using the Self-Compassion Scale (SCS), where a mean was calculated from the 12 items, which ranged from 1-5. High scores indicate high levels of self-compassion. We found highly significant improvements in the level of self-compassion, $t(74)=-5.778$, $p=<.01$. There was a medium-to-large effect size ($d=0.799$).



Level of Mindfulness was measured using an adapted version of the Five-Facet Mindfulness Questionnaire ('describe' subscales removed), where total scores ranged from 31-155. Higher scores indicate higher levels of mindfulness. We found a highly significant increase in mindfulness levels overall, $t(74)=-6.488$, $p=<.01$ and also on each of the four subscales, **OBSERVE** – $t(74)=-5.622$, $p=<.01$, **AWARE** – $t(74)=-5.453$, $p=<.01$, **NON-JUDGE** – $t(74)=-5.080$, $p=<.01$, and **NON-REACT** – $t(74) = -6.362$, $p=<.01$. There was a medium-to-large effect size for overall mindfulness ($d=-0.750$), and the observe ($d=-0.651$), aware ($d=-0.630$) and non-react ($d=-0.736$) subscales. There was a medium effect size for the non-judge subscale ($d=-0.587$).

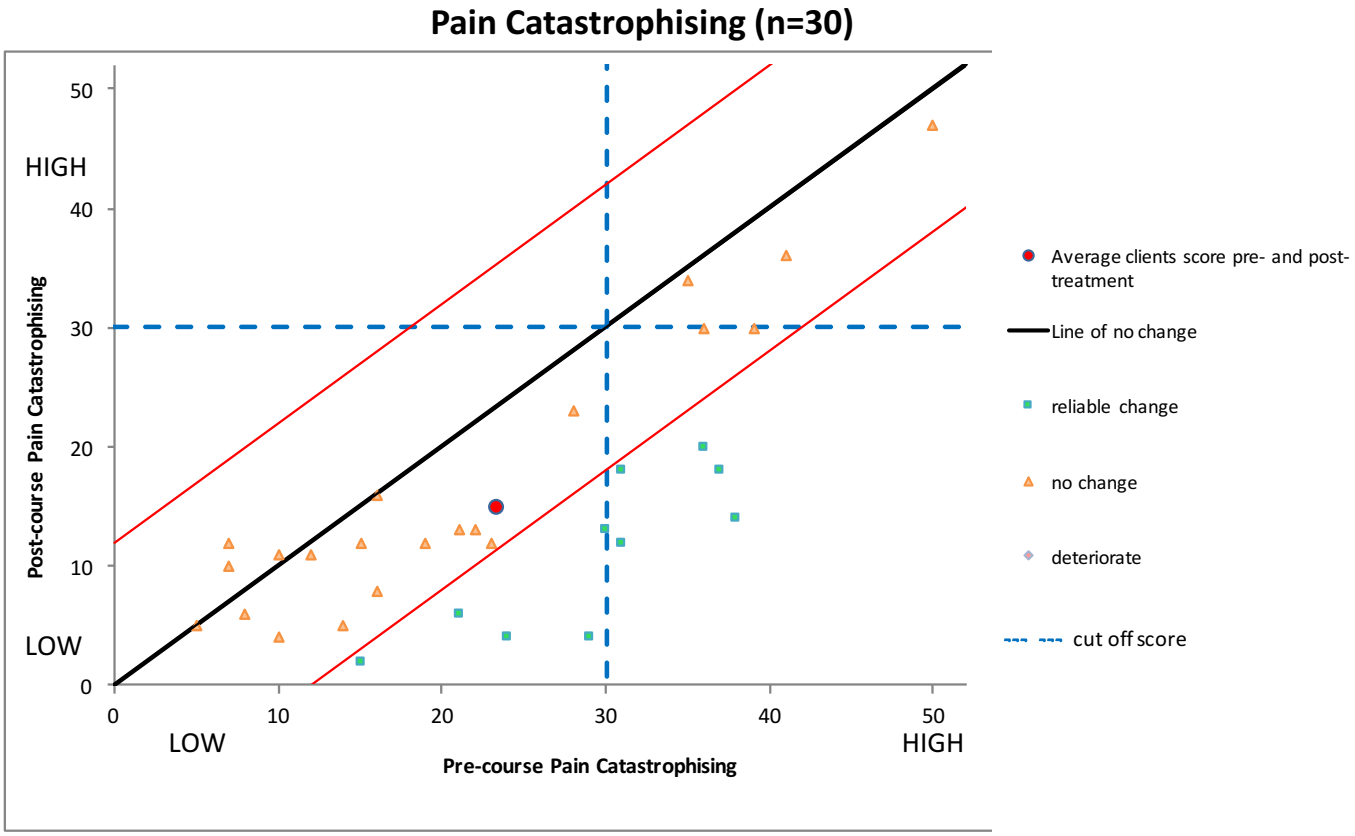


Reliability and Clinical Significance – Pre and Post Course

Below is a series of 'reliable change' graphs[1] which plot each individual's pre- and post- course score on a scatter plot. **We decided to only investigate those variables which were reported as 'highly significant'** (i.e. had a significance level of p=<.01), however we did not investigate level of mindfulness here as we used an adapted version of the FFMQ, which meant we did not have reliability estimates of the scale and clinically 'normal' scores in the literature to make calculations from. Figures show individual patient changes: whether they improved, had 'no change' or deteriorated. Note 'no change' does not mean their score did not improve or deteriorate, it simply means there was not enough of a change to attribute the cause to the MfH course rather than external factors. The graphs also show whether the change was:

Clinically significant –the blue dotted line shows the clinical cutoff score: above/below this line is of clinical concern, so participants who had a clinically concerning score at pre-course but not post-course made a clinically significant improvement. We selected our clinical cut off scores based on the existing academic literature.

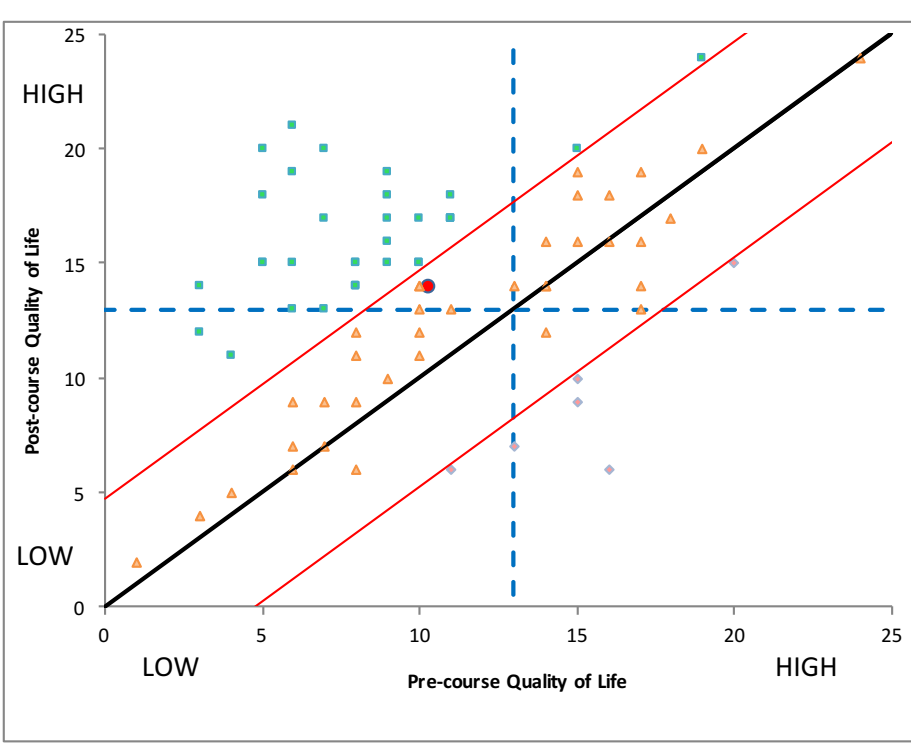
Reliable – the red parallel lines shows a reliable change: outside the margin change can be attributed to treatment effects, not to random variation in the scale. This relates to the idea of 'no change' as mentioned above.

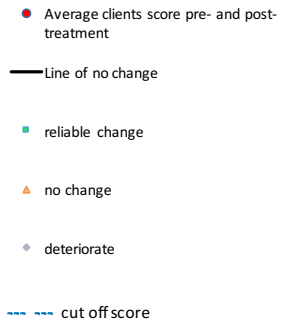


	Deteriorated	No reliable change	Reliably Improved	Clinically significant improvement
No. ppts (out of 31)	0	21	10	5

Pain catastrophising scores range from 0 (best) to 52 (worst). We set the clinical cut off at 30[2]. The small N was because only patients with pain completed this questionnaire. PCS scores were lower post-course (M=14.156, SD=10.746) than pre-course (M=22.093, SD=10.746).

Quality of Life (N=75)

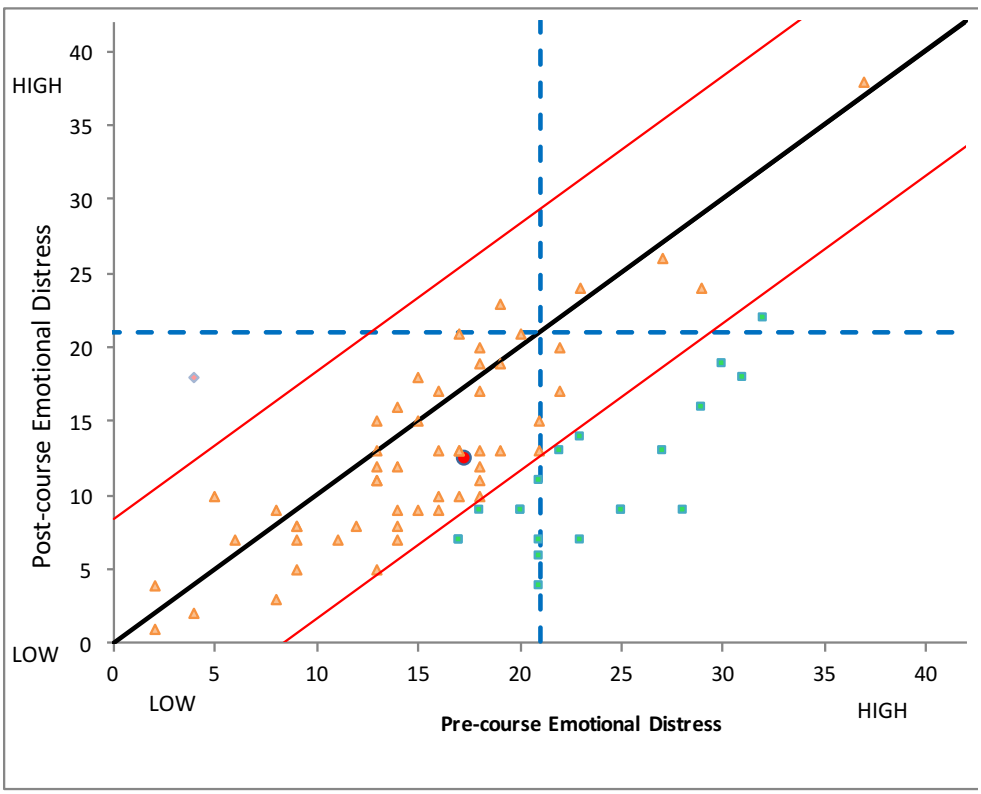


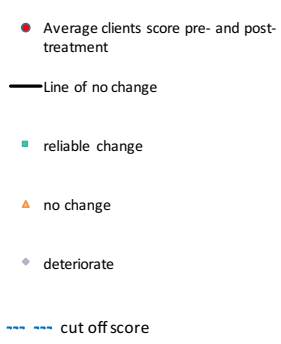


Quality of life scores range from 0 (worst) to 25 (best). We set the clinical cut off at 13[3]. QoL scores were higher post-course (M=14.13.776, SD=4.851) than pre-course (M=210.328, SD=4.851).

	Deteriorated	No reliable change	Reliably Improved	Clinically significant improvement
No. ppts	**6**	**36**	**33**	**23**

Emotional Distress (N=75)

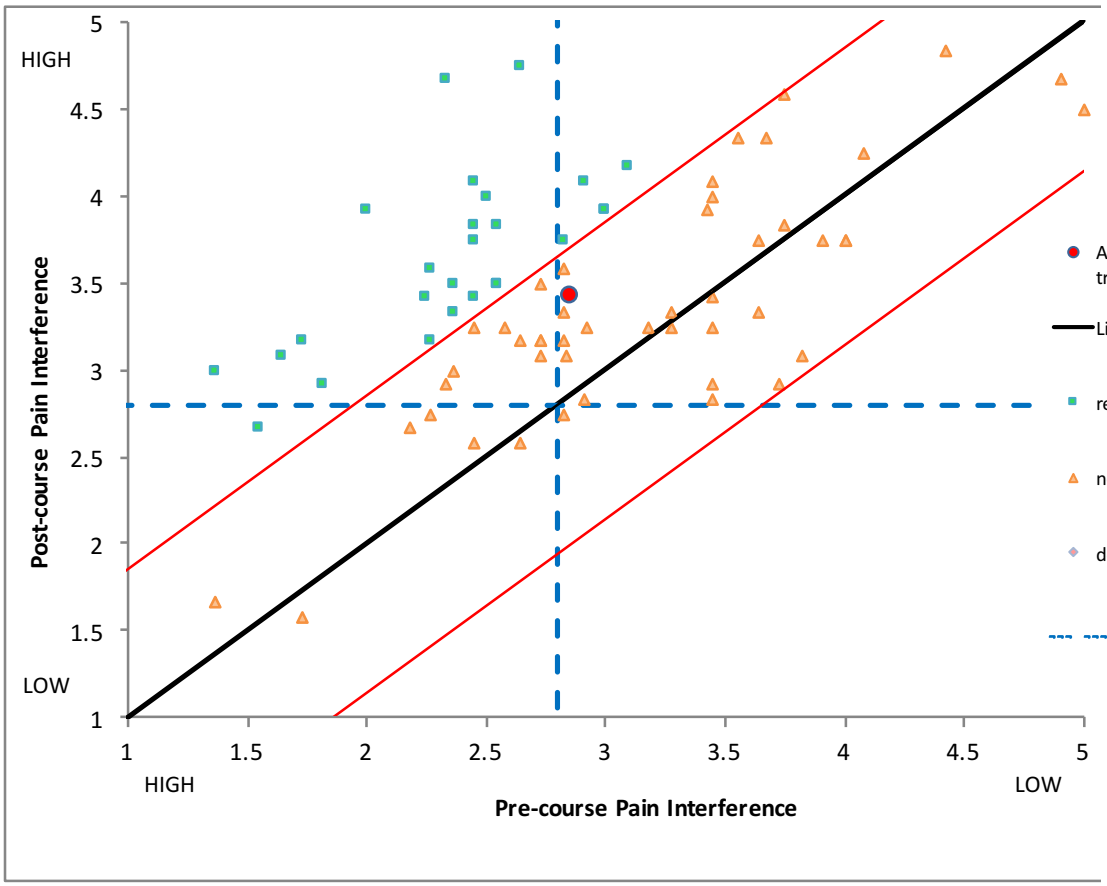




Emotional distress scores range from 0 (best) to 42 (worst). We set the clinical cut off at 21[4]. HADS scores were lower post-course (M=12.328, SD=6.477) than pre-course (M=17.355, SD=7.062).

	Deteriorated	No reliable change	Reliably Improved	Clinically significant improvement
No. ppts	**1**	**54**	**20**	**9**

Self- Compassion (N=75)



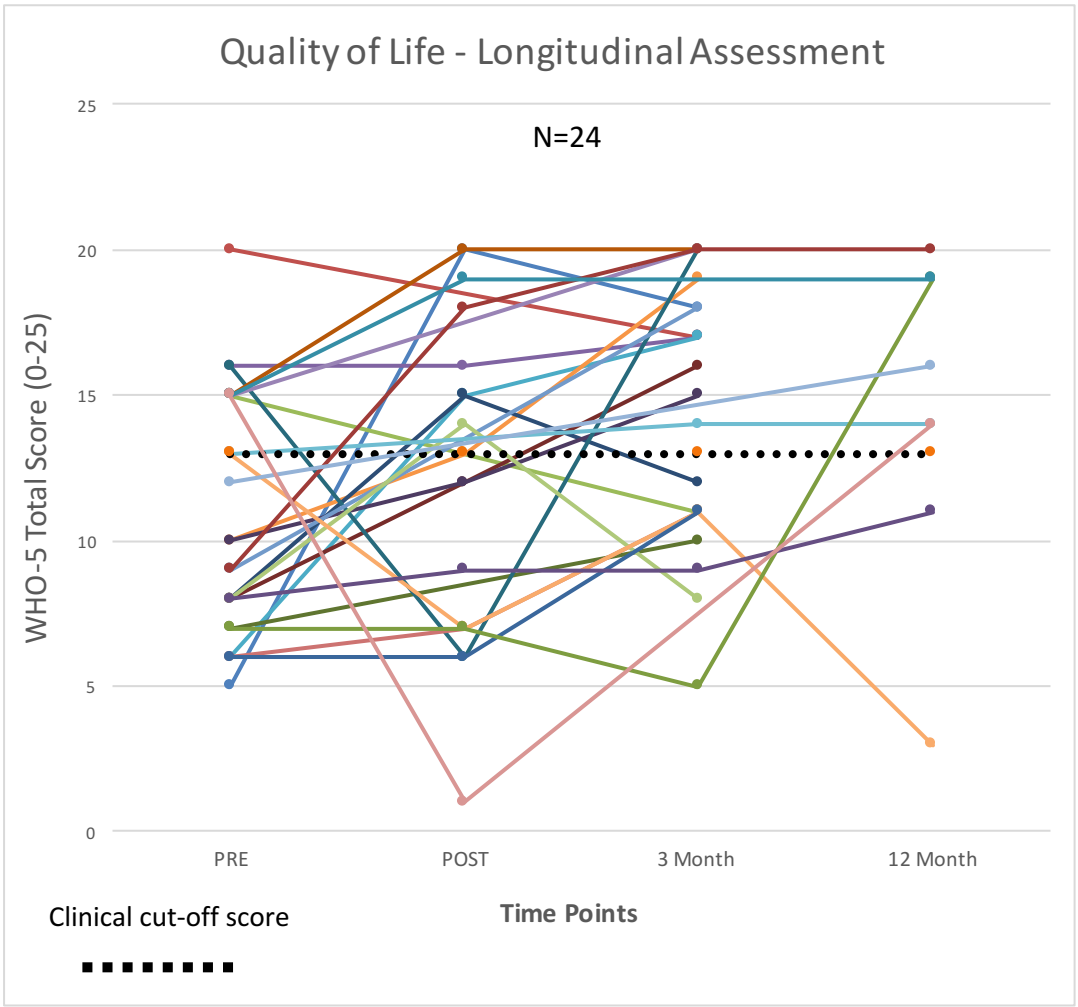
	Deteriorated	No reliable change	Reliably Improved	Clinically significant improvement
No. ppts	16	47	27	20

Self-Compassion scores range from 1 (worst) to 5 (best). We set the clinical cut off at 2.8[5]. PCS scores were higher post-course (M=3.421, SD=.746) than pre-course (M=2.852, SD=1.823).

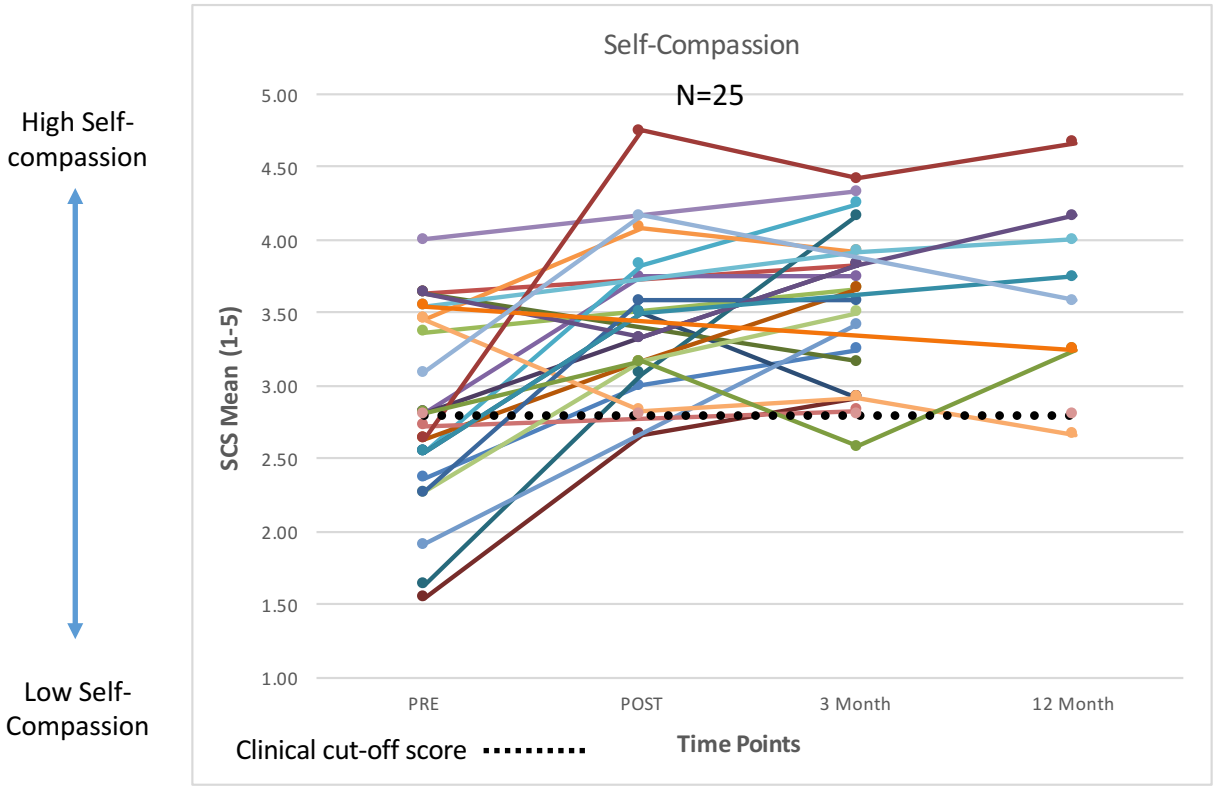
Note: Next section of results continue on next page

Longitudinal Effects of the MfH Course

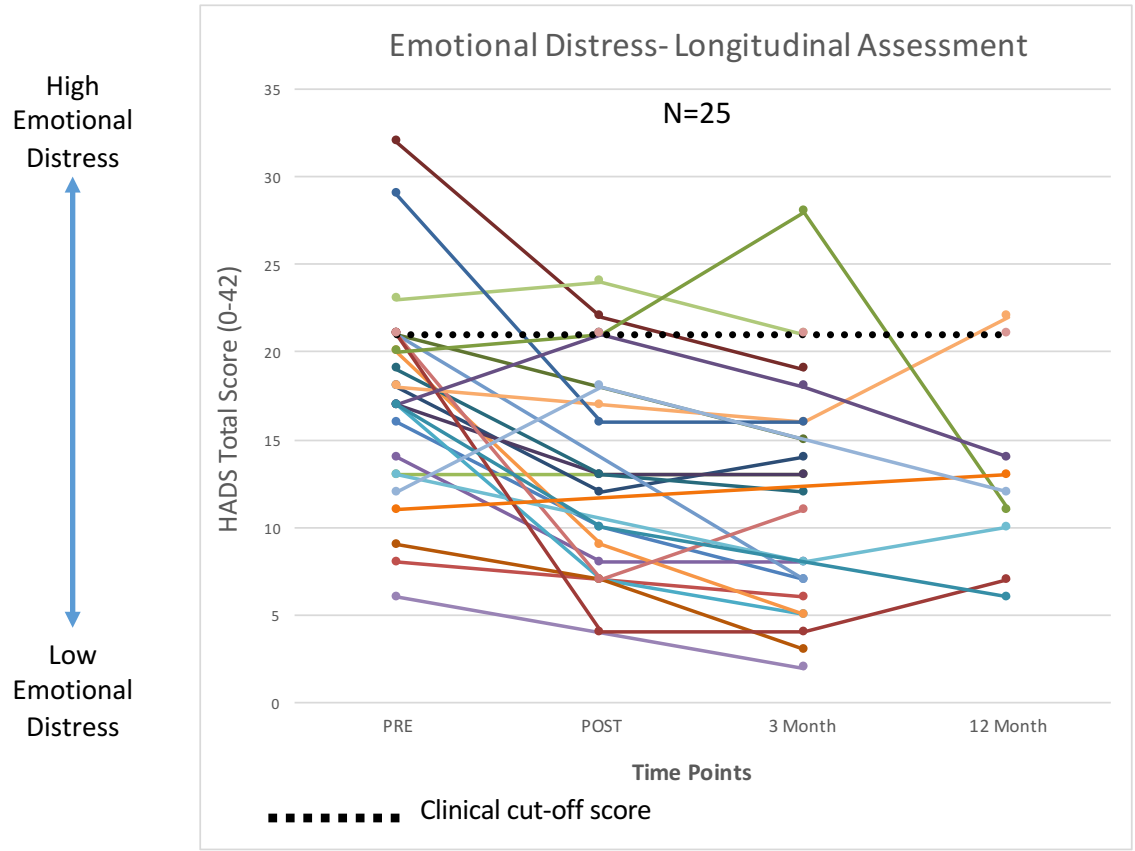
Below is a series of line graphs presenting individual participant scores for several measures over time. Comparisons in the accompanying tables refer to the change between each individuals **PRE score** to their **LATEST score** (whether that was 3 or 12 months after the MfH course. We chose to investigate those measures that were **highly significant** (i.e. p=<.01) and so these variables included; pain catastrophising, emotional distress, quality of life, self-compassion and level of mindfulness.. **Only participants who had completed at least one follow up measure, either a 3 or 12 month follow up, were investigated and so in all cases, the sample size was reduced**. Again, we have set a **clinical cut off** for those variables with available clinical benchmarks, meaning **scores lower than the black dotted line were of clinical concern**.



From a first glance at the graph, there appears to be a large variation in QoL scores, with a slight increase over time. However, when we look at the figures, the results look more promising. Before taking part in the course, **17/24** participants had a concerning QoL score, however **10/17** of these participants had moved into the 'healthy' score region by the end of the study, making a clinically significant improvement. When looking at improvement in the sample more generally, **11/24** participants' scores increased by **50%**, and **6/24 participants' scores doubled.** Perhaps a reason for such variation in the graph could be that QoL is a rather subjective measure, which may be interpreted differently by individuals, and so over time their life circumstances and life events may drastically alter their QoL scores at different time periods.

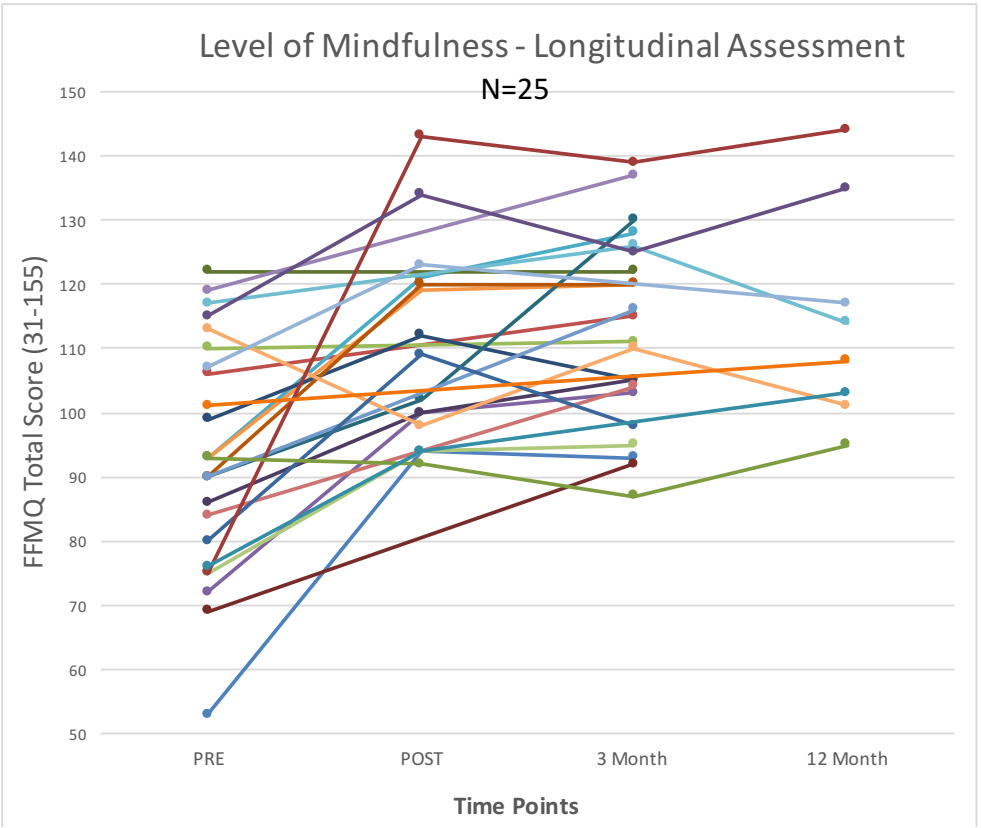


The line graph clearly demonstrated an increase in self-compassion scores over time, even 12 months after the course had finished. Before taking part in the course, **12/25** participants had a concerning self-compassion score, however **ALL** of these participants had moved into the 'healthy' score region by the end of the study, making a clinically significant improvement. When looking at improvement in the sample more generally, **12** participants score improved by at least 1/3, and **7** participants score improved by at least 1/2.



The line graph clearly demonstrated a decrease in emotional distress scores over time, even 12 months after the course had finished. Before taking part in the course, **7/25** participants had a concerning HADS scores, however **ALL BUT ONE** of these participants had moved into the 'healthy' score region by the end of the study, making a clinically significant improvement. When looking at improvement in the sample more generally, **8** participants score improved by at least 50%, and **7** participants score improved by at least 60%.

High Level of Mindfulness

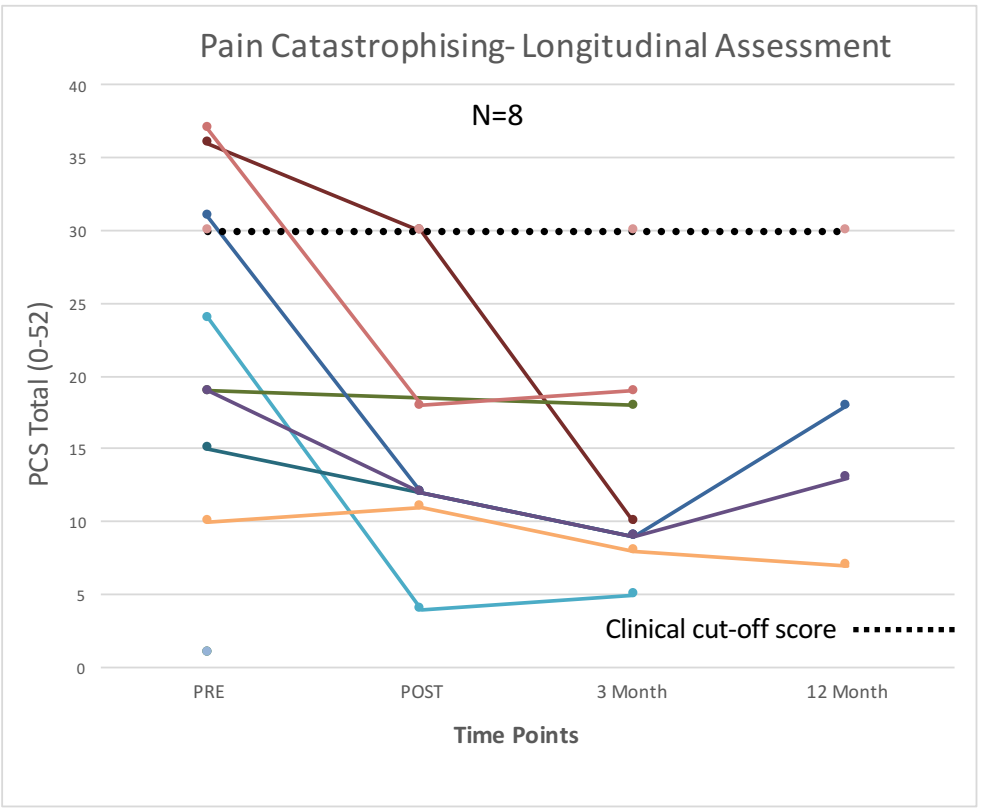


Low Level of Mindfulness

Note: there was no clinical cut-off score for this variable as we used an adapted version of the FFMQ which had not been tested in the literature.

The line graph clearly demonstrated an increase in mindfulness scores over time, even 12 months after the course had finished. **11** participants score improved by at least 1/4, and **2** participants score improved by at least 3/4.

High Level of Catastrophising



Low Level of Catastrophising

Note: The small N was because only patients with pain completed this questionnaire

The line graph clearly demonstrates a decrease in pain catastrophising over time, even 12 months after the course had finished. Before taking part in the course, **3/8** participants had a concerning HADS scores, however **ALL** of these participants had moved into the 'healthy' score region by the end of the study, making a clinically significant improvement. When looking at improvement in the sample more generally, **5** participants score improved by at least 40%, and **3** participants score improved by at least 70%.

FINAL NOTES

This research was conducted and analysed by **Shannon Phillips**, University of Leeds. Should you have any queries about the current research, please do not hesitate to contact Shannon at shannon.phillips@breathworks.co.uk

We are extremely keen to continue our ongoing research to provide an evidence base to our Breathworks courses. We are always looking to form partnerships with the wider academic community and others interested in mindfulness, and so if you would like to be involved in our research or have anything you would like to share with us, please do not hesitate to contact our research lead, **Colin Duff**. You can contact Colin during office hours, either by phone or by email; Direct line +44 (0) 161 674 9254, colin.duff@breathworks.co.uk

REFERENCES

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Morley, S., Dowzer, C.N. (2014) Manual for the Leeds Reliable Change Indicator: Simple Excel® applications for the analysis of individual patient and group data. University of Leeds, Leeds, UK.
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2. **Validation and Clinical Norms of the Pain Catastrophising Scale**
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Wu, S-F, V. (2014). Rapid screening of psychological well-being of patients with chronic illness: reliability and validity test on WHO-5 and PHQ-9 Scales. *Depression Research and Treatment*, (9 pages online).

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6. **Online effect size calculator** - http://www.cognitiveflexibility.org/effectsize/