

MINDFULNESS IN PEOPLE WITH A RESPIRATORY DIAGNOSIS: A SYSTEMATIC REVIEW

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ABSTRACT

Objectives: To describe how mindfulness is delivered and to examine the effect of mindfulness on health-related quality of life (HRQOL), mindful awareness and stress in adults with a respiratory diagnosis.

Method: Five electronic databases were searched. Data were extracted and assessed for quality by two reviewers.

Results: Data were extracted from four studies. Interventions were based on Mindfulness-Based Stress Reduction and delivered by trained instructors. Recordings of mindfulness were provided for home-based practice. One study targeted the intervention exclusively to anxious individuals with a respiratory diagnosis. Adherence to mindfulness was poor. No effects were seen on disease-specific HRQOL (Standardized mean difference (SMD) = -0.21 95% CI: -0.36 to 0.48, $p=0.78$), mindful awareness (SMD = 0.09 95% CI: -0.34 to 0.52, $p=0.68$) or stress levels (SMD = -0.11 95% CI: -0.46 to 0.23, $p=0.51$).

Conclusion: Mindfulness interventions, delivered to individuals with a respiratory diagnosis, varied widely in terms of delivery and the outcomes assessed making it difficult to draw any conclusions regarding its effectiveness.

Practical implications: Future mindfulness interventions for those with a respiratory diagnosis should be standardized for intervention, duration and outcome measures. Interventions should target specific sub-populations who have anxious symptoms and offer active long-term follow-up.

1. INTRODUCTION

The emotional impact of respiratory symptoms is profound. The experience of breathlessness promotes hyper-vigilance of respiratory symptoms [1] leading to increased stress, distress, anxiety and depression [2-4]. Anxiety about a distressing event can lead to post-traumatic stress disorder (PTSD) which has been found to affect 8% of individuals with stable chronic obstructive pulmonary disease (COPD) [5]. As the disease progresses acute exacerbations, characterized by a significant increase in breathlessness, become increasingly common. It is therefore likely that the prevalence of PTSD will increase as the disease progresses and as acute exacerbations increase in frequency and severity. Survivors of acute respiratory failure, severe enough to require mechanical ventilation, have symptoms of PTSD which may persist for one year post-hospitalization [2]. Stress, negative emotions and fear result in an unwillingness to participate in activities. Such avoidance promotes social isolation and further compromises exercise capacity and quality of life affecting the ability of patients with COPD to successfully manage their condition [6,7].

Feelings of distress provide the focus of several theory-based interventions including; Cognitive Behavioral Therapy (CBT) and mindfulness. Mindfulness aims to promote greater awareness of the unity between body and mind. Training involves developing a non-reactive awareness of thoughts, feelings and experiences which can undermine emotional and physical wellbeing [8]. Mindfulness can be delivered either on its own or as a key component of other therapies.

CBT emphasizes the identification and modification of maladaptive beliefs [9]. This may be difficult in the face of intense breathlessness as increased arousal and fear of death represent very real anxieties. Strategies to change thoughts may undermine legitimate feelings of anxiety associated with breathlessness, questioning the appropriateness of CBT alone [9]. Instead of altering cognitions it may be more helpful for individuals with respiratory conditions to modify their involvement with their thoughts, proposing a role for mindfulness.

A systematic review found mindfulness to be effective at improving mental health and depressive relapse compared to a wait list control or usual care group in a 'healthy' population. In clinical populations with physical illness, including multiple sclerosis, cancer and rheumatoid

arthritis, it was found to be effective at improving health-related quality of life (HRQOL) and wellbeing, although these results were only applicable to participants who had the interest and ability to participate in mindfulness. Other limitations of studies included in the review involved a shortage of active control groups and a lack of long term follow up [10]. Since the conduction of this review other studies, conducted in chronic disease populations, have shown mindfulness to be effective in improving mood and reducing symptoms of distress in individuals with breast cancer, inflammatory joint disease and coronary heart disease [11-13].

The technique of mindfulness, which uses breathing as a focus of concentration to re-direct thoughts and prevent rumination, may have uniquely supportive features for those with respiratory symptoms. Alternatively, drawing attention to breathing in those with dyspnea could provoke hyper-vigilance of breathless symptoms resulting in emotional distress [1]. To date, the effect of mindfulness for patients with a respiratory diagnosis has not been systematically explored.

Therefore the specific study objectives were: 1. to describe how mindfulness is delivered and structured for adults with a respiratory diagnosis and 2. To examine the effect of mindfulness on psychosocial outcomes, namely HRQOL, mindful awareness and stress. Such findings may help clinicians apply mindfulness for individuals suffering from breathlessness.

2. METHODS

This systematic review was registered with PROSPERO: CRD42015016954. The findings generated have been synthesized in a document consistent with PRISMA guidelines for reporting of systematic reviews and meta-analyses (Table 1) [14, 15].

2.2 Search strategy

An extensive search was conducted by one reviewer (SH), in conjunction with a professional librarian, of electronic databases including: PubMed, CINAHL, PsychINFO, EMBASE and MEDLINE from inception to March 2015. The search strategy for MEDLINE is out-lined in *Appendix 1* and was adapted for the other databases. The reference lists of key papers were searched to identify any further relevant studies.

2.3 Selection of articles

PICOS for the systematic review were as follows:

Participants; adults (>18years) with a respiratory diagnosis who are limited by symptoms of dyspnea.

Interventions: Mindfulness-Based Stress Reduction (MBSR) or Mindful Cognitive Behavioral Therapy (MCBT) were included. Modified interventions, with a reduced treatment time, or an alternative form of delivery, i.e. telephone-based, were also eligible. Interventions offering meditation alone were excluded.

Comparator: a passive control (i.e. waiting list), or an active control (i.e. exercise or education) was considered.

Outcomes; psychosocial health outcomes listed in each of the studies including, but not limited to, quality of life and psychological morbidity were included, although to be considered for meta-analysis data relating to the mean difference (SD) pre to post intervention or the mean (SD) scores had to be available. Adherence to the interventions was also considered. Studies examining only the cost-effectiveness of an intervention were excluded.

Study design; studies applying quantitative methodologies were included. For the meta-analytic purpose of objective 2, only Randomized Controlled Trials (RCTs) comparing mindfulness to a control group were included.

Any papers categorized as unsure were discussed between reviewers and a consensus reached. Following the removal of duplicates, two reviewers (SH and AL) screened the titles and abstracts. The appropriateness of the full text papers was checked against the inclusion/exclusion criteria.

2.4 Data extraction

Data extraction was performed by one reviewer (SH) and verified by a second reviewer (AL). To meet the aims of objective 1, all information describing the mindfulness therapy was extracted including the duration, the components, the manner in which the intervention was delivered and by whom e.g. nurse, physiotherapist, psychologist. A detailed description of the participants, including any screening, and adherence to the intervention was also noted. For the purpose of objective 2, the results of the studies were summarized according to the effect of mindfulness on all psychosocial health outcomes.

2.5 Determination of study quality

The methodological quality of RCTs was appraised using the Cochrane Collaboration's tool [16]. The tool consists of a two part assessment allowing the reviewers to assign a judgment relating to the risk of bias ('Low risk' of bias, 'High risk' of bias, or 'Unclear risk') across six domains. The Quality Checklist for Healthcare Intervention Studies was applied to assess the risk of bias in observational studies [17]. The modified version of this tool allows reviewers to assign points up to a maximum score of 28 [18]. Each study was assessed independently by two reviewers (SH and AL) and a consensus reached.

2.6 Analysis

To achieve objective 1, a descriptive summary of the interventions tested in the included studies was conducted. The evidence for each intervention was reviewed to establish how mindfulness was delivered to individuals with a respiratory diagnosis. To meet objective 2, a meta-analysis exploring the effect of mindfulness was conducted for any psychosocial health outcomes assessed in two or more studies post-intervention [19]. Heterogeneity was tested according to the I^2 statistic, with substantial heterogeneity represented by $I^2 \leq 50\%$ [20]. This 'cut off' informed the application of a fixed or random model respectively. Standardized mean difference (SMD) was used for all meta-analyses to aid comparison with other systematic reviews. The SMDs reported are for Hedges' (adjusted) g .

3. RESULTS

A total of 252 articles were reviewed, of which 239 were excluded after screening the title and abstract. Full text was obtained for 13 papers plus one additional reference which was identified following reference checks of the full texts. Ten studies were excluded following appraisal with reasons for exclusion documented in Figure 1 [21-30]. Four papers were included; two involved individuals with COPD [31-32], one included an asthma population [33] and one study examined those admitted to critical care with a diagnosis of respiratory failure [34].

3.1. Quality Assessment

Overall the risk of bias for the RCTs, assessed using the Cochrane Collaboration's tool, was low with no studies receiving a "high risk" of bias in any of the six domains. (Table 2). In one study

it was unclear how randomization had been concealed [32], blinding of the outcome assessor was only described in one study [33]. Cox et al received a score of 15 out of a possible 28 on The Quality Checklist for Healthcare Intervention Studies. This score is above the cut off of 10 which is considered to indicate poor methodological quality [17]. This paper was a pilot study but specific concerns included the study design [34].

3.2. Description of mindfulness delivered to adults with a respiratory diagnosis

All interventions were based on the principles of MBSR encouraging a moment by moment non-judgmental awareness. All RCTs delivered treatment over eight weeks with the exception of one study which delivered the intervention to an acute population for seven weeks. Weekly sessions varied in duration ranging from 30 minutes [34] to 2.5 hours [33]. The inclusion of a full-day retreat, in keeping with a traditional MBSR approach [8] was only offered to an asthma population [33]. Home based practice was encouraged in all RCTs with recordings of mindfulness provided [31-33]. No studies offered active follow up at home. Two studies delivered interventions by instructors trained in MBSR [31,32]. The other intervention was delivered by nurses trained in meditation [34]. One study did not describe the training of the instructors [33]. Only one study targeted the intervention to individuals identified as having mild to moderate symptoms of anxiety at baseline [34]. A full description of the delivery and structure of mindfulness to adults with a respiratory diagnosis appears in Table 3.

3.2.1. Adherence to the intervention

All studies commented on reasons for non-adherence. Pbert et al documented similar low levels of adherence in both the intervention and control groups with individuals completing less than 75% of available sessions [33]. Mulaski et al reported that 30% in the control group and 52% in the intervention group did not complete at least 75% of assigned sessions or dropped out of the study [32]. Almost 50% of critical care patients enrolled into a mindfulness intervention were unable to complete the program [34]. Chan et al report that a minimum of six meditation classes were attended by 63% of those enrolled in the intervention [31]. Practical reasons for attrition most often noted across all studies included; transport, time commitments, or illness [31,32,34].

3.3. The effect of mindfulness on health outcomes in adults with a respiratory diagnosis

3.3.1. Meta-analysis

Disease-specific HRQOL, stress and mindfulness were assessed in two or more studies post-intervention and were therefore eligible for meta-analysis. The questionnaires were examined for similarity by two reviewers (SH, AL). The results for all meta-analyses appear in Figure 2.

Disease-specific HRQOL did not differ significantly between mindfulness and the control condition (Standardized mean difference (SMD) = -0.21 95% CI: -0.36 to 0.48, $p=0.78$) [31,32,33] (Figure 2a). Mindful awareness assesses an individual's experience of mindfulness, their open awareness and attention to what is taking place at the present moment. A measurement of mindfulness awareness can be used to explain the effects of mindfulness on health outcomes. Assessment was conducted using the 5-factor Mindfulness Questionnaire [32] and the Freiburg Mindfulness Inventory [31]. There were no significant differences in mindful awareness between those who completed the intervention and those assigned to a control condition (SMD = 0.09 95% CI: -0.34 to 0.52, $p=0.68$) [31,32] (Figure 2b), nor were there any significant differences in stress levels between-groups post-intervention (SMD = -0.11 95% CI: -0.46 to 0.23, $p=0.51$) [32,33] (Figure 2c).

Only the trial by Pbert et al, conducted a long term follow up. Although no effects of mindfulness on stress were observed in the short term, stress was found to be significantly improved from baseline in the intervention control compared to the control group at 12 month follow up ($p=0.001$) [33].

3.3.2. Other psychosocial health outcomes

Generic HRQOL was assessed in one study using the SF-36 for veterans [32]. The results were divided into the physical and mental health components. Whilst there was no change observed in the mental health component following completion of the intervention, the physical component worsened ($p<0.05$) [32]. Two studies explored the effect of mindfulness on anxiety. No between-group differences were found by Chan et al using the revised Anxiety Sensitivity Index ($p>0.05$) [31] although, 75% of critical care patients experienced a reduction in their Hospital Anxiety and

Depression Scale (HADS) score. Cox et al also found that Post-Traumatic Symptoms Score (PTSS) reduced following completion of a mindfulness intervention [34]. One study described the effect of mindfulness on coping. Cox et al reported that adaptive coping (assessed using the brief COPE) did not change pre to post-intervention (pre score 22 post score 21) although statistical tests were not conducted [34].

4. DISCUSSION AND CONCLUSION

4.1 Discussion

This is the first review exploring the effect of mindfulness delivered to individuals with a respiratory diagnosis. Mindfulness interventions were based on the principles of MBSR but varied widely in terms of their delivery and the outcomes assessed. As per the results from the meta-analyses, no impact of Mindfulness was observed on disease-specific HRQOL, levels of mindful awareness or stress [31-33]. Positive between-group differences were not detected in generic HRQOL or anxiety [31,32], although reductions in psychological morbidity were observed pre-post intervention [34].

Adherence to mindfulness was poor in all studies and yet, a qualitative investigation of a mindfulness health program for individuals with COPD, consisting of eight weekly two hour sessions, found that 70% of patients completed the program at 12 months follow up [29]. Even at one year patients reported having enhanced feelings of compassion and joy which lead to the adoption of healthy behaviors [29].

Individuals who have higher levels of stress and anxiety may be more motivated to engage in an intervention which aims to reduce negative self-evaluations leading to distress. However, despite mindfulness showing some success in reducing symptoms of anxiety [35], only one intervention targeted those with high anxious symptoms [34]. That said, it was reported that those who were less anxious were more likely to attend classes [31], perhaps because these individuals are better equipped to overcome the practical barriers frequently cited as reasons for non-attendance to mindfulness interventions in the included studies. In the study by Pbert and colleagues [33], where individuals with asthma displayed high levels of stress at baseline compared to the general

population, there was a significant reduction in stress at 12 months. Long-term follow up appears to be important in assessing the benefits of mindfulness. Positive effects at 12 months have been noted in those with rheumatic arthritis [12] although no lasting effects were seen in individuals with coronary heart disease [13]. However, the former group did receive a booster session at six months.

A limitation of this review is the inconsistency of outcomes assessed which makes comparison between studies difficult. Psychosocial outcomes included; HRQOL, stress, mindful awareness, psychological morbidity and coping. Feelings of compassion were not examined across any of the included studies despite psychological morbidity being negatively associated with shame-based emotions and self-compassion [36].

The absence of effect may also be attributed to the quality of the interventions as in one study mindful awareness was reduced [31]. In fact, only one intervention followed the traditional practice of MBSR in which teaching mindfulness also includes a full day retreat [33]. In persons affected by cancer, an intervention which included a full day retreat was successful at improving mindful awareness [37], although this was not the case in those with rheumatoid arthritis [38]. The necessity of including a full day retreat in a mindfulness intervention is still unknown and the effects of its absence in the majority of studies included in this review are difficult to quantify.

Traditional MBSR involves the re-direction of attention towards one's own breath. For those with a respiratory diagnosis this might be problematic as it could evoke increased attention to dyspnea and avoidance of activity. Therefore it is important to establish the best way of delivering mindfulness to populations with a respiratory diagnosis.

This review is markedly limited by the heterogeneous population enrolled, the interventions applied and the outcome measures. Only a small number of studies have delivered mindfulness to those with a respiratory diagnosis and those studies with similar outcomes were few, however we conducted a meta-analysis to provide any additional insight into the usefulness of the outcomes applied. Although some of the studies in this review improved on shortcoming of a

previous review, such as the inclusion of an active control group and intervention delivery by trained instructors [10], adherence was poor and no studies included active long-term follow-up with all interventions included in this review being delivered for eight weeks or less.

4.2 Conclusion

Mindfulness delivered to individuals with a respiratory diagnosis is inconsistent in terms of its delivery, enrollment criteria and outcomes assessed, making it difficult to draw any meaningful conclusions from the current literature. However, mindfulness interventions based on the principles of MBSR delivered with no active long-term follow up were not successful in improving psychological outcomes in individuals with a respiratory diagnosis.

4.3 Practical implications

Future mindfulness interventions for those with a respiratory diagnosis should be standardized for intervention, duration and outcome measures. Interventions should target specific sub-populations who have anxious symptoms and offer active long-term follow-up.

Conflicts of interest: 'none'

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Table 1. PRISMA check list [15]

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	4
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	4
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	5
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	4
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	A.1
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	5
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	5

Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	5
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	6
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	6
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	6
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	6 and Table 2
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N/A
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	6 and Figure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	7 and Table 3
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	6 and Table 2
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	8 and Figure 2
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	8 and Figure 2
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	6 and Table 2
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	N/A
DISCUSSION			

Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	9
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	11
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	11
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	12

Table 2. Quality assessment of the randomized controlled trials

Author (date)	Random sequence bias	Allocation concealment	Performance bias	Detection bias	Attrition bias	Reporting bias	Other
Pbert et al (2012)	<u>Low:</u> Group assigned was by a random allocation scheme with block sizes of 4 and 6.	<u>Unclear:</u> No description of how randomisation was concealed.	<u>Unclear:</u> blinding of participants or personnel is not reported.	<u>Low:</u> The evaluators were blind to the treatment assignment.	<u>Low:</u> Attrition to the intervention was reported, withdrawal was documented but reasons were not supplied. Total number of patients randomized and assigned to each group was reported. Those who did not receive the intervention were still included in the analysis (Intention to treat).	<u>Low:</u> all outcomes were discussed.	None
Mularski et al (2009)	<u>Low:</u> Randomised using	<u>Low:</u> Assignments were pre-	<u>Low:</u> control group were	<u>Unclear:</u> Blinding of participants or	<u>Low:</u> Attrition to the intervention	<u>Low:</u> all outcomes	

	preprinted sealed assignments generated by a random-number-generating program.	printed and sealed	offered education.	personnel is not reported.	was reported, withdrawal with reasons was documented. Total number of patients randomised and assigned to each group was reported. No participants were re-included in the analysis.	were discussed.	
Chan et al (2015)	<u>Low</u> : An independent researcher assigned participants to groups using a list of randomly generated numbers and by blocking on lung function	<u>Unclear</u> : No description of how randomisation was concealed only stated that it was sent to an independent researcher.	<u>Unclear</u> : Blinding of participants or personnel is not reported	<u>Unclear</u> : Blinding of the outcome assessor not reported..	<u>Low</u> : Attrition to the intervention was reported, withdrawal with reasons was documented. Total number of patients randomised and assigned to each group was reported. No participants were re-included in the analysis.	<u>Low</u> : all outcomes were discussed.	None

Table 3. Delivery of mindfulness, the outcomes assessed and effectiveness

Author (date) and diagnosis	Population (n, gender, age (mean years))	Program	Control group	Outcomes and method of assessment (FU)	Significant findings (p<0.05)
Pbert at al (2012) - Asthma	83 (27 male): intervention = 42 (51.9y), control = 41 (53.6y)	<p><u>Delivery:</u> 8 weeks of MBSR consisting of 2.5h weekly group sessions and an all-day 6h retreat in week 6. Home practice was prescribed for 30mins 6 days a week. Information on the instructors delivering the intervention was not provided.</p> <p><u>Continued support:</u> Two CDs containing guided mindfulness exercises.</p>	A Healthy Living Course matched for time and contact. Lectures and discussions on self-care topics were provided, including; nutrition, physical activity, coping with stress, sleep, life balance and hygiene.	<p><u>Quality of life:</u> AQOL</p> <p><u>Stress:</u> PSS</p> <p><u>Length of FU:</u> 10w, 6m and 12m</p>	Overall AQOL improved in the intervention group compared to the control at 12m and in each of the 4 AQOL components Stress improved in the MBSR group compared to the control at 12m.

Mularski et al (2009) - COPD	86 (74 male): intervention = 44 (71y), control = 42 (64y)	<p><u>Delivery:</u> 8 weeks of MBBT consisting of once weekly group meetings and daily self-administered practice. MBSR program with supplemental relaxation during the first 2 weeks to maximize the breath centered approach. The 3 interventionalists had previously completed clinical training at the Center for Mindfulness or the Harvard Mind-Body Medicine program and each had over a decade of experience practicing and facilitating CAM therapies. Prior to the start of the program all interventionalists completed an 8 week MBSR training program.</p> <p><u>Continued support:</u> Relaxation response cards and 3 recordings featuring the interventionalists in this study.</p>	A support group, matched for time and contact, consisted of semi-structured conversations about the disease experience with open time to discuss issues identified and they received daily diaries.	<p><u>HRQOL:</u> SGRQ and the SF-36 for veterans</p> <p><u>Mindfulness:</u> 5-factor Mindfulness Questionnaire</p> <p><u>Stress:</u> PSS</p> <p><u>Length of FU:</u> 8w</p>	The SF-36 for veterans physical summary score was improved in the support group over the interventions group.
Cox et al (2014) – Acute respiratory failure	11 (3 male, 54y)	<p><u>Delivery:</u> 7 weeks of a mindfulness intervention adapting the common core principles of MBSR delivered via the telephone in weekly sessions lasting 30minutes. Initiated 2 weeks post-hospital discharge.</p> <p><u>Continued support:</u> None reported</p>	N/A	<p><u>Psychological distress:</u> HADS</p> <p><u>Post-traumatic stress disorder:</u> PTSS</p> <p><u>Coping:</u> Brief COPE</p> <p><u>Mindfulness:</u> Five Facet Mindfulness Questionnaire</p> <p><u>HRQOL:</u> EQ-5D</p>	Statistical comparisons were not performed due to the small sample size and exploratory nature of the study.

Chan et al (2015) - COPD	41 (14 male, 69.5y): intervention = 19, control = 22	<u>Delivery:</u> 8 weekly 60minute sessions of MBSR. The traditional focus of breath was minimised and techniques included: Ujjayi berthing, a labyrinth for walking meditation, QiGong as a mindful movement exercise and spiritual mantras. The mindfulness meditation was delivered by a nurse trained in MBSR and maintained a long-standing personal practice. <u>Continued support:</u> weekly hand outs and a CD of all meditation.	Wait-list control group	<u>Anxiety:</u> The revised Anxiety Sensitivity Index <u>HRQOL:</u> CRQ <u>Mindfulness:</u> Freiburg mindfulness inventory <u>Length of FU:</u> 8w	Anxiety improved in the intervention group compared to the control group. Mindfulness decreased in the intervention group compared to the controls.
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MBSR: Mindfulness-based Stress Reduction; PSS: Perceived Stress Scale; AQOL: Asthma Quality of Life Questionnaire; FU: Follow up; SGRQ: St Georges respiratory Questionnaire; HADS: Hospital Anxiety and Depression Scale; PTSD; Post-Traumatic Symptom Scale; CRQ: Chronic respiratory Questionnaire; ED-5D: Euroqual; CD: Compact Disc.