

Meditative movement for breathlessness in advanced COPD or cancer: a systematic review and meta-analysis

Dr Claire Nolan

Lecturer in Physiotherapy, Brunel University London

Dr L Brighton, Ms Y Mo, Dr J Bayly, Prof I Higginson, Prof W Man, Prof M Maddocks

Disclosure

- Name: Claire Nolan
- Affiliation: Brunel University London
- Relationships with for-profit and not-for-profit interests:
 - Committee member: NHS National Respiratory Programme, Pulmonary Rehabilitation workstream
 - Committee member: NICE Early Value Assessment: Pulmonary rehabilitation technologies for adults with COPD
 - Co-chair: British Thoracic Society Pulmonary Rehabilitation Advisory Group
- Grants / Research support:
 - NIHR RfPB, NIHR Advanced Fellowship, Brunel University London, Royal Brompton and Harefield Hospital Charities
- Consulting fees: Nil
- Other: Currently employed at Brunel University London, previously employed at Harefield Hospital

Background

- Breathlessness is a common and burdensome symptom in advanced stages of malignant and non-malignant disease
- Meditative movement may be a potential intervention to improve breathlessness



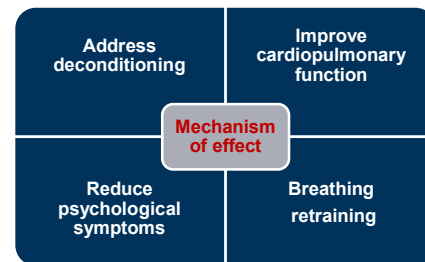
Tai chi



Yoga



Qi gong



Research to date

- ✓ Systematic reviews of meditative movement or single practice in people living with malignant and non-malignant disease
- ✓ Meditative movement is safe
- ✗ Breathlessness has not been investigated as a primary outcome
- ✗ Conflicting results for breathlessness
- ✗ No data on the effect of meditative movement in people living with advanced disease

Aim

- To provide a comprehensive synthesis of the evidence base regarding the effect of meditative movement on breathlessness in people living with advanced disease

Objectives

Variable	Selection of outcome measures
Breathlessness (primary outcome)	MRC, Baseline Dyspnoea Index, Borg Dyspnoea Scale
Exercise capacity	6MWT, incremental shuttle walk test
Functional performance	Short Physical Performance Battery, walking speed tests
Psychological symptoms	HADS, GAD-7, PHQ-9
Health-related quality of life	EORTC QLQ-C30, LC13, Chronic Respiratory Questionnaire
Safety	Adverse and serious adverse events

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5

Methods

Information sources:

- 11 English and 4 Chinese language databases

Eligibility criteria:

- Adults diagnosed with advanced disease with a high prevalence of breathlessness undergoing tai chi, yoga or qi gong in any setting
- Advanced disease (50% of participants with following criteria):
 - Advanced or local metastatic cancer: T≥3, N≥1, M≥1
 - COPD: FEV₁ ≤50%
 - Chronic heart failure: New York Heart Association Stage III or IV

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6

Methods

Data extraction and management

- Two reviewers using a standardised data extraction form
- Third reviewer to resolve differences

EndNote™

covidence

RoB 2 tool

Review Manager 5.4.1

Assessment of risk of bias

Data analysis

- Mean or standardised mean differences with 95% confidence intervals were plotted using forest plots
- Statistical heterogeneity
- Sub-group analysis: 1) comparator intervention, 2) disease, 3) intervention type

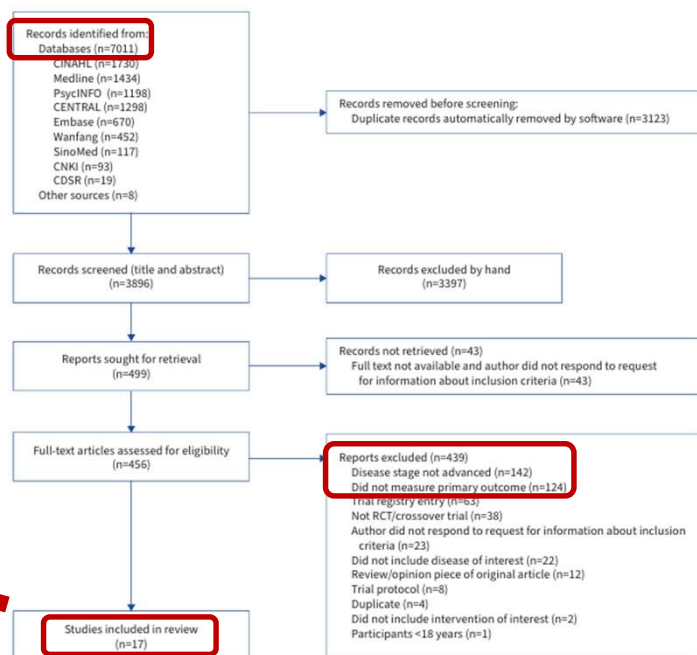
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7

Results

Included studies:

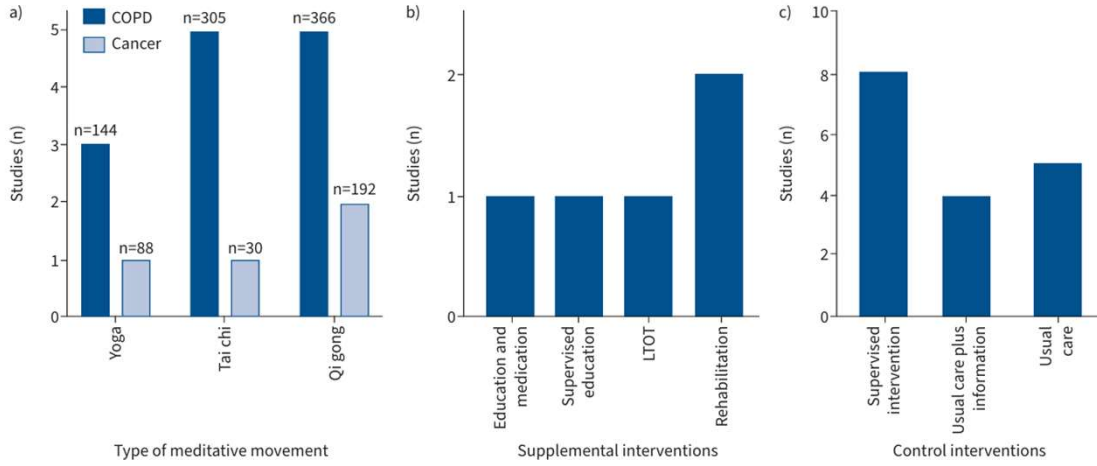
- 17 studies, n=1125
- 13 English, 4 Chinese languages
- COPD: 13 studies, n=815
- Cancer: 4 studies, n=310
- 70% male
- 74% White



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8

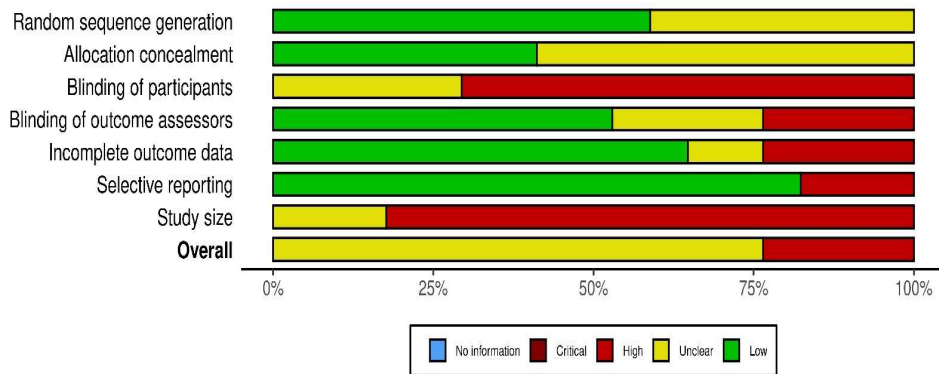
Results



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9

Results



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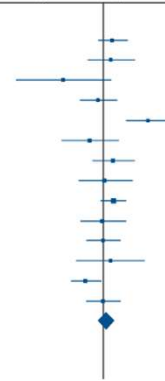
10

Results: Breathlessness – primary outcome

14 studies
n=671

Study or subgroup	Meditative movement			Control			Weight %	Std mean difference IV, random (95% CI)	Year	Std mean difference IV, random (95% CI)
	Mean	SD	Total	Mean	SD	Total				
All participants										
HOSAKOTE <i>et al.</i> [37]	-5.7	12.7	42	-10.1	17.6	33	9.3	0.29 (-0.17-0.75)	2009	
DONESKY-CUENCO <i>et al.</i> [42]	16.8	6.3	14	15.2	6.6	15	6.2	0.24 (-0.49-0.97)	2009	
YEH <i>et al.</i> [34]	5.6	0.7	5	6.4	0.5	5	2.5	-1.19 (-2.60-0.22)	2010	
NG <i>et al.</i> [38]	5.2	1.3	23	5.4	1.3	29	8.1	-0.15 (-0.70-0.40)	2011	
DONGXIN ZHAO <i>et al.</i> [31]	-6.4	1.3	24	-8.4	1.6	24	7.2	1.35 (0.72-1.98)	2011	
YUEXIA <i>et al.</i> [32]	-1.5	0.5	11	-1.3	0.5	11	5.2	-0.38 (-1.23-0.46)	2014	
KAMINSKY <i>et al.</i> [40]	-2.1	1	21	-2.4	0.9	22	7.5	0.31 (-0.29-0.91)	2017	
VANDERBYL <i>et al.</i> [36]	-2	2	11	-2.2	2.8	13	5.6	0.08 (-0.73-0.88)	2017	
POLKEY <i>et al.</i> [13]	-0.7	0.6	55	-0.9	0.7	55	10.3	0.30 (-0.07-0.68)	2018	
YANCHAN <i>et al.</i> [45]	-1.7	0.8	18	-1.7	0.8	18	7.0	0.00 (-0.65-0.65)	2019	
MOY <i>et al.</i> [39]	0.1	1.1	34	0.1	1.1	35	9.1	0.00 (-0.47-0.47)	2021	
CHEUNG <i>et al.</i> [43]	-23.2	14.4	7	-26.2	12.7	8	4.1	0.21 (-0.81-1.23)	2021	
MOLASSIOTIS <i>et al.</i> [41]	16	3.2	31	17.5	2.6	47	9.2	-0.52 (-0.98--0.06)	2021	
MALIK <i>et al.</i> [46]	-1	1	30	-1	1	30	8.7	0.00 (-0.51-0.51)	2022	
Subtotal (95% CI)			326			345	100.0	0.10 (-0.15-0.34)		

Heterogeneity: Tau²=0.12; Chi²=30.11, df=13 (p=0.005); I²=57%
Test for overall effect: Z=0.76 (p=0.45)



No significant difference in mean difference between meditative movement and control
Same result for sub-group analyses: comparator intervention, disease, intervention

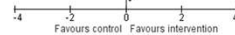
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Health-related quality of life

10 studies
n=454

Study or Subgroup	Meditative movement			Control			Weight	Std. Mean Difference IV, Fixed, 95% CI	Year	Std. Mean Difference IV, Fixed, 95% CI
	Mean	SD	Total	Mean	SD	Total				
Donesky Cueenco 2009	35.4	9.7	14	36.8	8.8	15	8.6%	-0.15 [-0.88, 0.58]	2009	
Vadiraia 2009	-4.2	3.3	42	-7.4	8.4	33	16.0%	0.65 [0.18, 1.11]	2009	
Yeh 2010	5.3	0.7	5	5.4	0.6	5	2.3%	-0.14 [-1.38, 1.10]	2010	
Ng 2011	44	17.7	23	45.5	19.9	29	11.7%	-0.08 [-0.63, 0.47]	2011	
Kaminsky 2017	-42.2	11.6	21	-49.8	21.6	22	9.5%	0.43 [-0.18, 1.03]	2017	
Vanderbyl 2017	80	16	11	85	20	12	5.2%	-0.26 [-1.09, 0.56]	2017	
Cheung 2021	88.2	9.5	7	83.2	9.3	8	3.3%	-0.50 [-0.53, 1.54]	2021	
Molassiotis 2021	59.4	12.2	31	55.5	11.7	47	16.8%	0.32 [-0.13, 0.78]	2021	
Moy 2021	0.1	0.7	34	-0.1	0.6	35	15.5%	0.30 [-0.17, 0.78]	2021	
Malik 2022	-48.9	48.4	30	-30.6	12	30	13.2%	-0.51 [-1.03, 0.00]	2022	
Total (95% CI)			218			236	100.0%	0.16 [-0.03, 0.35]		

Heterogeneity: Chi²= 15.35, df= 9 (P= 0.08); I²= 41%
Test for overall effect: Z = 1.66 (P= 0.10)



Exercise capacity

11 studies
n=407

Study or Subgroup	Meditative movement			Control			Weight	Mean Difference IV, Random, 95% CI	Year	Mean Difference IV, Random, 95% CI
	Mean	SD	Total	Mean	SD	Total				
Donesky Cueenco 2009	443	124	14	452	70	15	6.1%	-9.00 [-82.99, 64.99]	2009	
Yeh 2010	465	74	5	351	117	5	3.0%	114.00 [-7.34, 235.34]	2010	
Dongxin Zhao 2011	336	30	24	291	30	24	14.2%	45.00 [28.03, 61.97]	2011	
Ng 2011	339	62	23	321	70	29	11.3%	18.00 [-17.93, 53.93]	2011	
Yuessa Wang 2014	479	34	11	429	51	11	11.2%	50.00 [33.78, 66.22]	2014	
Kaminsky 2017	316	95	21	262	122	22	7.0%	64.00 [-1.19, 129.19]	2017	
Vanderbyl 2017	-4	46	11	73	60	12	10.1%	-77.00 [-120.49, -33.51]	2017	
Yanchan Zhen 2019	413	63	18	411	101	18	8.3%	2.00 [-52.99, 56.99]	2019	
Cheung 2021	428	53	7	421	54	8	8.4%	7.00 [-47.24, 61.24]	2021	
Moy 2021	7	53	34	-5	41	35	13.4%	12.00 [-10.40, 34.40]	2021	
Malik 2022	131	158	30	110	97	30	8.9%	21.00 [-45.34, 87.34]	2022	
Total (95% CI)			198			209	100.0%	17.50 [-6.06, 41.06]		

Heterogeneity: Tau²= 845.29; Chi²= 35.09, df= 10 (P= 0.0001); I²= 72%
Test for overall effect: Z = 1.46 (P= 0.15)



No significant difference in mean difference between meditative movement and control

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Results

Insufficient data for meta-analysis:

- Functional performance
- Psychological symptoms

Safety data:

	Intervention	Control
Adverse events	44 (19%)	26 (11%)
Serious adverse events	16 (6%)	15 (5%)
Adverse or serious adverse events related to the intervention	0 (0%)	0 (0%)

Interpretation of findings

Reasons why meditative movement does not improve breathlessness:

- Modified MRC scale was the most commonly used outcome measure
- Outcome measures may not capture specific experiences of breathlessness
- Heterogenous meditative movement interventions with supplemental interventions
- Interventions may not have been sufficiently challenging to result in physiological adaptations to exercise, and therefore changes in breathlessness
- Heterogenous comparator interventions

Strengths:

- Largest review to investigate the effect of meditative movement in people living with advanced disease
- Rigorous methodology

Limitations:

- Data only available for COPD and cancer
- High or unclear risk of bias
- High statistical heterogeneity
- Unable to include all 17 retrieved studies
- Unable to perform meta-analysis on all outcomes

Conclusion

- Meditative movement is safe but does not improve breathlessness, exercise capacity or health-related quality of life or in advanced COPD or advanced cancer.
- This research is limited by bias and wide heterogeneity leading to low levels of certainty in the results
- Future research:
 - Explore the synergistic effect of meditative movement and other evidence-based interventions that improve breathlessness in advanced disease
 - Investigate the broader effects of meditative movement on functional performance, psychological symptoms, physical activity and activities of daily living in advanced diseases

Thank you to....

- Dr Lisa Brighton
- Ms Yihan Mo
- Dr Joanne Bayly
- Prof Irene Higginson
- Prof William Man
- Prof Matthew Maddocks



Royal Brompton and
Harefield hospitals



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17

Thank you for listening



claire.nolan@brunel.ac.uk

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18