

Konference – 5. oktober 2023

Kompetencecenter for Lungesygdomme



Mette Kaasgaard, PostDoc, ph.d.

Singing in Respiratory Disease – Sing-a-Lung

Pulmonary Research Unit (PLUZ),
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The Research and Implementation Unit PROgrez
Department of Physiotherapy and Occupational Therapy
Næstved-Slagelse-Ringsted Hospitals





Ph.d. degree (2022)

Danish Research Foundation's Center of Excellence:
Center for Music in the Brain,
Department of Clinical Medicine,
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M.Sc. - Digital Design and Communication – Digital Experiences and Art
IT University of Copenhagen



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Classical Singer and Singing Pedagogue
The Royal Danish Academy of Music



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3 original papers

Open access Original research

BMJ Open Heterogeneity in Danish lung choirs and their singing leaders: delivery, approach, and experiences: a survey-based study

Mette Kaasgaard ^{1,2}, Ingrid Charlotte Andersen ^{1,3}, Daniel Bech Rasmussen ^{1,3}, Ole Hilberg ^{3,4}, Anders Løkke ^{3,4}, Peter Vuust ², Uffe Bodtger ^{1,3,5}

ABSTRACT
Objectives Singing is considered a beneficial leisure time intervention for people with respiratory diseases, and lung choirs have gained increasing attention. However, there is no available guideline on preferred methodology, and hence, outcomes, delivery, and benefits are unclear. The present study investigated for the first time ever emerged delivery, approach, and experiences in Danish lung choirs and their singing leaders, hypothesising the array to be heterogeneous, without disease-specific approach, and a challenging field to navigate for the singing leaders.
Setting An online survey comprising 25 questions was performed individually, May 2017, in Denmark.
Participants Current singing leaders of Danish lung choirs, identified by hand searches on the internet. In total, 33 singing leaders in formal and informal settings were identified and 20 (67%) responded.

Strengths and limitations of this study

- This study is unique in several ways and is the first Danish study to explore lung choir singing leaders' experiences of methodological practice, approach, and challenges in the new field of lung choirs.
- The study allowed for an explorative approach and included components from both quantitative and qualitative research, through which we discovered new and unexpected aspects.
- Data analysis with methodological rigour and transparency strengthened validity and reliability of the study, using relevant quality tools and criteria for validation, recommended for assessing trustworthiness.
- The survey form limits the possibility of indepth insight which could have been provided through in-

BMJ Open: first published as 10.1136/bmjopen-2020-041700 on 30 November 2020. Downloaded from

EUROPEAN RESPIRATORY JOURNAL
ORIGINAL RESEARCH ARTICLE
M. KAASGAARD ET AL.

Use of Singing for Lung Health as an alternative training modality within pulmonary rehabilitation for COPD: a randomised controlled trial

Mette Kaasgaard ^{1,2}, Daniel Bech Rasmussen ^{1,3}, Karen Hjerrild Andreasson ^{1,3,4}, Ole Hilberg ^{3,5}, Anders Løkke ⁵, Peter Vuust ² and Uffe Bodtger ^{1,3,6}

¹Pulmonary Research Unit Region Zealand (PLUZ), Dept of Respiratory Medicine, Zealand University Hospital, Naestved, Denmark. ²Dept of Clinical Medicine, Center for Music in the Brain, Aarhus University, Denmark and the Royal Academy of Music, Aarhus/Aalborg, Denmark. ³Dept of Regional Health Research, University of Southern Denmark, Odense, Denmark. ⁴Dept of Physiotherapy and Occupational Therapy, Naestved-Slagelse-Ringsted Hospitals, Naestved, Denmark. ⁵Dept of Respiratory Medicine, Lillebaelt Hospital, Vejle, Denmark. ⁶Dept of Internal Medicine, Zealand University Hospital Roskilde, Roskilde, Denmark.

Corresponding author: Mette Kaasgaard (mk@clin.au.dk)

Shareable abstract (@ERSpublications)
Singing for Lung Health was non-inferior to physical exercise training in short-term improvement of 6-min walk test distance in COPD patients attending pulmonary rehabilitation. In both groups, the effect was related to high adherence. <https://bit.ly/3uoP4Q8>

Cite this article as: Kaasgaard M, Rasmussen DB, Andreasson KH, et al. Use of Singing for Lung Health as an alternative training modality within pulmonary rehabilitation for COPD: a randomised controlled trial. *Eur Respir J* 2021; 59: 2101142. DOI: 10.1183/13993003.01142-2021.

Abstract
Background Pulmonary rehabilitation (PR) is a cornerstone in the management of COPD. However, the optimal PR modality remains unclear. Singing for Lung Health (SLH) is a novel PR modality. We investigated the effect of SLH compared with physical exercise training in short-term improvement of 6-min walk test distance in COPD patients attending pulmonary rehabilitation. In both groups, the effect was related to high adherence. <https://bit.ly/3uoP4Q8>

Chronic obstructive pulmonary disease

BMJ Open Respiratory Research Physiological changes related to 10 weeks of singing for lung health in patients with COPD

Mette Kaasgaard ^{1,2}, Daniel Bech Rasmussen ^{2,3}, Anders Løkke ^{3,4}, Peter Vuust ¹, Ole Hilberg ^{3,4}, Uffe Bodtger ^{2,3}

ABSTRACT
Background Singing for Lung Health (SLH) was non-inferior to physical exercise training in improving 6-minute walking test distance (6MWD) and quality of life (St. George's Respiratory Questionnaire (SGRQ)) within a 10-week pulmonary rehabilitation (PR) programme for COPD in our recent randomised controlled trial (RCT) (NCT03280355). Previous studies suggest that singing improves lung function, respiratory control and dyspnoea, however this has not yet been convincingly confirmed. Therefore, this study aimed to explore the impact of SLH on physiological parameters and the associations with achieving the minimal important difference (MID) in 6MWD and/or SGRQ.
Methods We conducted post hoc, per-protocol analyses mainly of the SLH group of the RCT, exploring associations with 6MWD and SGRQ results by stratifying into achieving versus not-achieving 6MWD-MID (≥ 30 m) and SGRQ-MID (≤ -4 points); changes in lung function, inspiratory muscle strength/control, dyspnoea, and heart rate response using

WHAT IS ALREADY KNOWN ON THIS TOPIC
⇒ Singing for lung health (SLH) as part of community-based pulmonary rehabilitation has shown effects on walking distance and quality of life (QoL) in COPD, but current knowledge on the impact of SLH on physiological parameters is scarce.

WHAT THIS STUDY ADDS
⇒ This study suggests that improvements in 6-minute walking test and QoL during a short-term SLH programme is associated with diverse physiological changes in patients with COPD.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE, AND/OR POLICY
⇒ Our findings support that SLH has physiological impact besides being a pleasant leisure time activity in COPD. However, further studies are needed to explore associations and to conclude on benefits of

To cite: Kaasgaard M, Rasmussen DB, Løkke A, et al. Physiological changes related to 10 weeks of singing for lung health in patients with COPD. *BMJ Open Respir Res* 2022; 9:e001206. doi:10.1136/bmjresp-2022-001206

► Additional supplemental material is published online only. To view, please visit the journal online (<http://dx.doi.org/10.1136/bmjresp-2022-001206>).

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1. Heterogeneity in Danish lung choirs and their singing leaders: delivery, approach, and experiences: a survey-based study. Kaasgaard, M., Andersen, I.C., D.B. Rasmussen, Vuust, P., Hilberg, O., Løkke, A., Bodtger, U. *BMJ Open* 2020;10:e041700. DOI: 10.1136/bmjopen-2020-041700
2. Use of Singing for Lung Health as an alternative training modality within pulmonary rehabilitation for COPD: an RCT. M. Kaasgaard, D. Bech Rasmussen, K. Andreasson, A. Løkke, P. Vuust, O. Hilberg, U. Bodtger. *European Respiratory Journal* 2021. DOI:10.1183/13993003.01142-2021
3. Physiological changes related to 10 weeks of Singing for Lung Health in patients with COPD. M. Kaasgaard, D. Bech Rasmussen, A. Løkke, P. Vuust, O. Hilberg, U. Bodtger. *BMJ Open Respiratory Research* 2022. DOI: 10.1136/bmjresp-2022-001206

PhD-afhandling (forsvar 10/6 2022):

Singing in Pulmonary Rehabilitation of Patients with Chronic Obstructive Pulmonary Disease (COPD)

Link: <https://drive.google.com/file/d/1vuXJuFaHZLnDQMNYZEj4RXWLowqoj6En/view?usp=sharing>



Akademiske vejledere: Peter Vuust, Uffe Bødtger, Ole Hilberg, and Anders Løkke

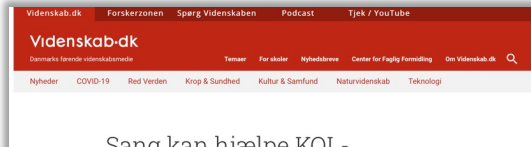
Center for Music in the Brain,
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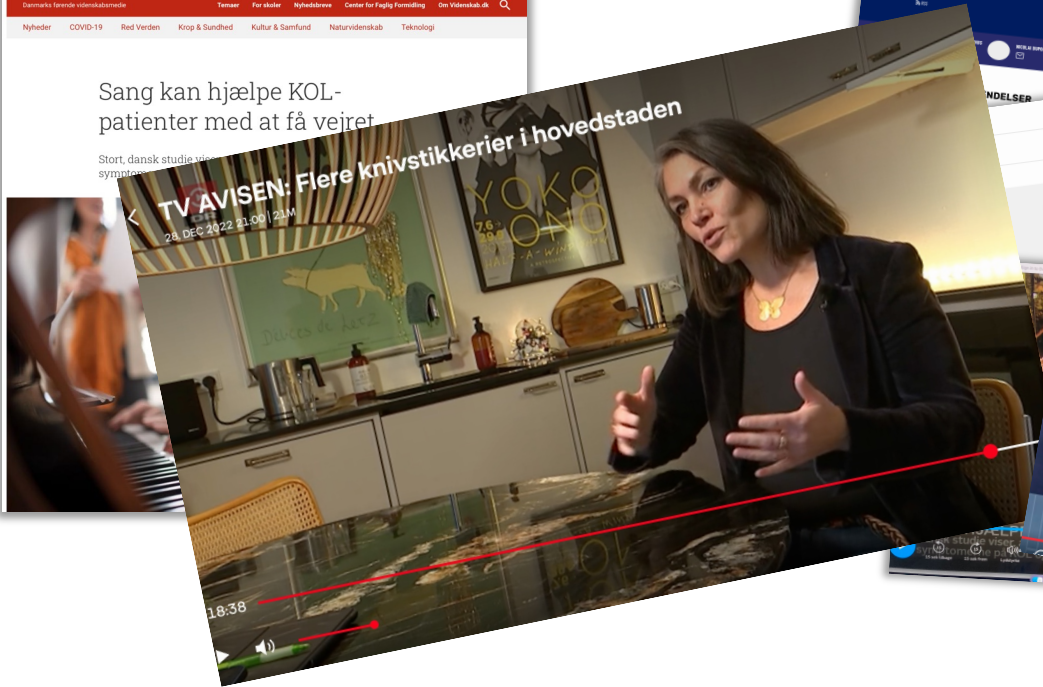


Artikel på Videnskab.dk

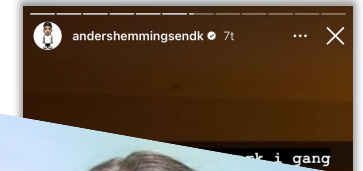


Sang kan hjælpe KOL-patienter med at få vejret

Stort, dansk studie viser symptomer



Instagram/
Anders Hemmingsen



Juni 2023



Danmarks bedste kliniske
forsøg og afprøvninger

Partnere

Danske Patienter

Dansk Selskab for Fysioterapi

Dansk Sygepleje Selskab [DASYS]

Lægeforeningen

Lægemiddelindustriforeningen [Lif]

Lægevidenskabelige Selskaber, LVS

Medicoindustrien

Pharmadanmark – Fagforeningen for life science

Trial Nation

Dagens Medicin

Årets forskerinitierede kliniske forsøg



Danmarks Bedste Kliniske forsøg & afprøvninger 2023 *Årets forskerinitierede kliniske forsøg Mette Kaasgaard og Uffe Bødtger.

Sing-a-Lung 1.0, Mette Kaasgaard, Lungemedicinsk Forskningsenhed [PLUZ]

Sjællands Universitetshospital samt Center for Music in the Brain, Institut for Klinisk Medicin, Aarhus Universitet

“

Udtalelse fra vinderen: “I lungerehabiliteringen er der en udfordring med meget stort frafald, og patienter med KOL er svære at nå og fastholde. Derfor er der brug for nye tilgange, som både adresserer det fysiske og det psykosociale, og som er sjove og nemmere at holde fast i efterfølgende”.

Background: COPD

Third leading cause of death worldwide¹

Prevalence

Globally:

- 11.7% (8.4%–15.0%) in persons aged 30+ years²
- 384 million cases

Denmark:

- 4th largest health-care problem
- Amounts 10% of national healthcare budget
- 14.3% in persons aged 35+ years³
- 430,000 cases

Background: Pulmonary Rehabilitation (PR)

Adherence and maintenance

- Availability
- Lack of awareness
- Transportation issues
- Motivation and education
- Inability to perform

Request for investment in PR as part of increased

Mainly psychological

- Mindfulness

- Walking a dog

supplement

Other/combined

- Home-based tele-solutions



Background: Singing

Singing is a human basic function

Lung choirs/singing groups

Initial research

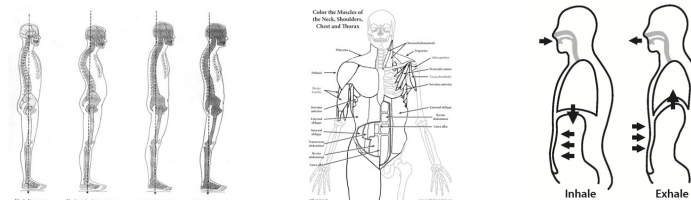
- Characterised by:
 - Heterogeneity
 - Various purposes
 - Myths and miracles...
 - Mis-match in findings
- Lack of knowledge
- Lack of high-quality and rigorous research
- Relevant in pulmonary rehabilitation???
 - Drop out
 - Maintenance/upkeep



Relevance in pulmonary rehabilitation?

- **Physically oriented activity**

- Singing involves the whole body
- Training effect without noticing....
- *"Singing and breathing are intimately related"*¹



- **Psychosocially oriented activity**

- Associated with joy and cohesion
- Being among peers
- Break isolation
- Not focusing on the disease
- Spiritual aspects, meaning

- Long-term upkeep – fidelity/"family"
- Activity and engagement in local community



Ph.d.

TOPIC 1:
WHAT?

TOPIC 2:
DOES IT
WORK?

TOPIC 3:
WHAT
WORKS?

TOPIC 4 (/2.1):
DOES IT WORK
- AND WHY?

TOPIC 5 (/3.1):
WHAT WORKS
- AND WHY?

What is a
lung choir
and how are lung
choirs currently
delivered in
Denmark?

Does singing
in COPD
work?

When singing
in COPD
works, how
does it work?

Does singing
in lung
cancer work
- and what is
the impact?

How might
singing impact
physiology?

STUDY 1

STUDY 2

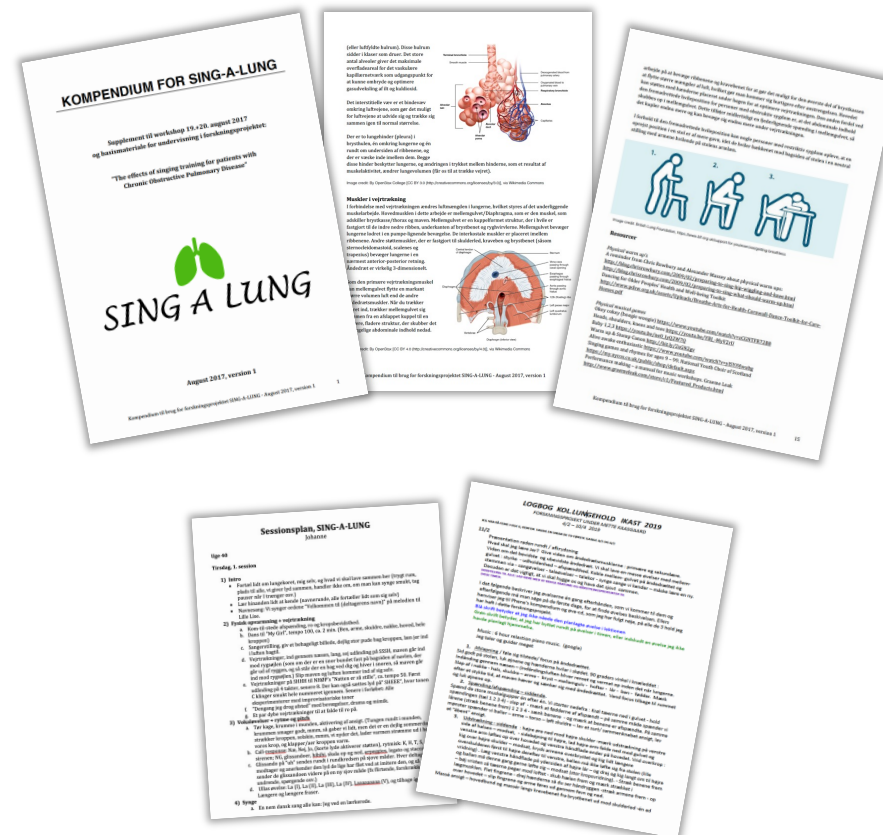
STUDY 3

STUDY 4

STUDY 5

PostDoc

Methods: RCT



1. Cave Lewis A Fancourt D, P. Singing for Lung Health. in *Routledge Companion to Interdisciplinary Research in Singing* (ed. Heydon R, F. D. & C. A.) Volume iii Wellbeing,
 2. Lewis, A. et al Singing for Lung Health-a systematic review of the literature and consensus statement. *NPJ Prim Care Respir Med* **26**, 16080 (2016).
 3. Lewis, A., Cave, P. & Hopkinson, N. S. Singing for Lung Health: a qualitative assessment of a British Lung Foundation programme for group leaders. *BMJ Open Respir Res* **4**, e000216 (2017).



Vigtigste fund fra RCT

Physical capacity and

Change factors associations with achieving MID

Factors associated
in 6MWD (≥ 30 m)

6MWD-MID achieved

Multivariable Logistic Regression: Selected change factors			
Variable	OR	95% CI	p-value
Heart Rate Response - 50% change			
0 (no)	Base		
1 (yes)	3.14	[1.1;8.8]	0.03

SGRQ-MID achieved

Multivariable Logistic Regression: Selected change factors			
Variable	OR	95% CI	p-value
MIP MID (≥ 17 cm H ₂ O)			
0 (no)	Base		
1 (yes)	4.35	[1.1;17.6]	0.04

g modality and achieving
(MID) of 6MWD (30 metres)

—■— Singing for Lung Health
—◆— Physical Exercise Training

	OR	95% CI	P-value
SGRQ-MID			
0 (no)	1.00	Reference	
1 (yes)	1.46	[0.79;2.68]	0.23
SGRQ-MID			
0 (no)	1.00	Reference	
1 (yes)	8.25	[2.09;32.65]	0.01
1 (yes)	16.95	[4.93;58.25]	<0.001

is ratios (ORs) were computed
ed-effects logistic regression.

Variable	OR	95% CI	p-value
Training modality			
PEXT			
SLH			
Adherence to training			
0-49%			
50-74%			
75-100%			
6MWD at baseline			
Q1 Lowest distance			
Q2			
Q3			
Q4 Highest distance			

Table text: Constant term
using univariable logistic

Variable	OR	95% CI	p-value
mMRC			
Baseline	2.2 ± 1.2	2.0 ± 1.2	0.25
Follow-up	2.0 ± 1.2	2.0 ± 1.3	0.97
Change from baseline	0.2 ± 0.7***	0.1 ± 0.8	0.07 [-0.38;0.60]

Baseline Follow-up

Ph.d.

TOPIC 1:
WHAT?

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Does singing
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cancer work
- and what is
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How might
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physiology?

STUDY 1

STUDY 2

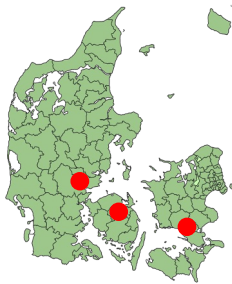
STUDY 3

STUDY 4

STUDY 5

PostDoc

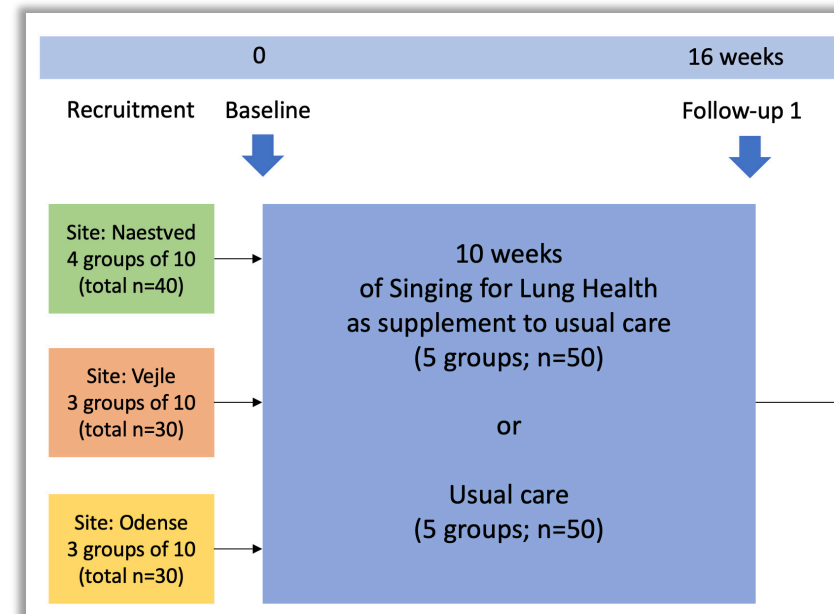
RCT – singing in NSCLC



- Sjællands Universitetshospital, Næstved
- Odense Universitetshospital
- Sygehus Lillebælt, Vejle

- Patients after surgical resection for NSCLC
- N=100

- 6MWT
- QoL
- Symptom burden (cluster)
- Anxiety and Depression
- Lung function
- Respiratory muscle strength
- Dyspnoea
- Breathing vigilance



Qualitative study – singing in NSCLC



Impact of singing...

- Meaning og singing
- Experience og singing with peers
- Experience of symptom burden
- Experience of dyspnoea
- Experience of tools adapted
- ...?

Tak til fonde, puljer og institutioner



- Institut for Klinisk Medicin, Aarhus Universitet
- Medicinsk Afdeling, Sjællands Universitetshospital, Roskilde og Næstved
- Næstved-Slagelse-Ringsted Sygehuse – Lokal Forskningspulje
- Region Sjællands Sundhedsvidenskabelige Forskningsfond
- Region Midt – Folkesundhed i Midten
- TrygFonden
- Helsefonden
- Aase og Ejnar Danielsens Fond
- Danmarks Lungeforenings Forskningsfond
- Fonden til Lægevidenskabens Fremme
- Forskningscenter for Lungekræft
- Kræftens Bekæmpelse
- Novo Nordisk-fonden

TAK!

Vem kan segla förutan vind

1. Vem kan segla förutan vind?

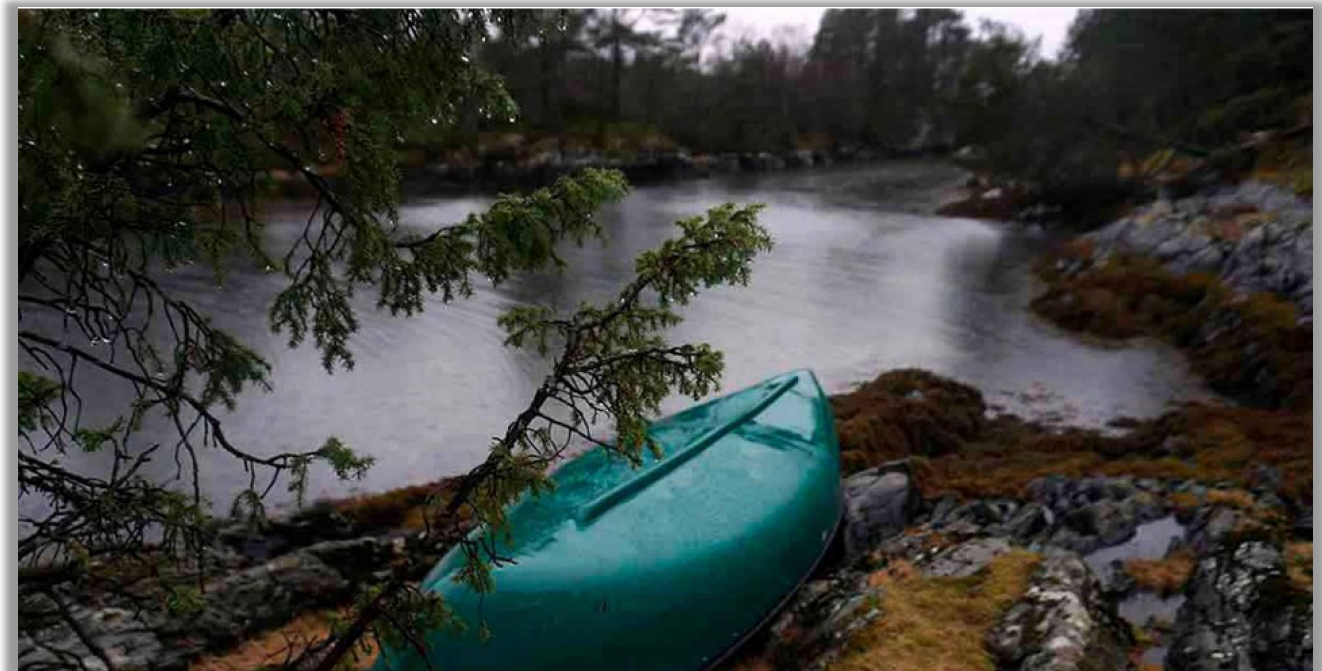
Vem kan ro utan åror?

Vem kan skiljas från vännen sin
utan att fälla tårar?

2. Jag kan segla förutan vind,

jag kan ro utan åror,

men ej skiljas från vännen min
utan att fälla tårar?



Mette Kaasgaard, PostDoc, ph.d.

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PhD-afhandling:

Singing in Pulmonary Rehabilitation of Patients with Chronic Obstructive Pulmonary Disease (COPD). M. Kaasgaard (forsvar 10/6 2022).

Link: <https://drive.google.com/file/d/1vuXJuFaHZLnDQMNYZEj4RXWLowqoj6En/view?usp=sharing>

Forskningsartikler fra Ph.d.:

Heterogeneity in Danish lung choirs and their singing leaders: delivery, approach, and experiences: a survey-based study. 2019. Kaasgaard, M., Andersen, I.C., D.B. Rasmussen, Vuust, P., Hilberg, O., Løkke, A., Bodtger. U.BMJ Open2020;10:e041700. DOI: 10.1136/bmjopen-2020-041700

Link: <https://bmjopen.bmj.com/content/10/11/e041700>

Use of Singing for Lung Health as an alternative training modality within pulmonary rehabilitation for COPD: an RCT. 2021. M. Kaasgaard, D. Bech Rasmussen, K. Andreasson, A. Løkke, P. Vuust, O. Hilberg, U. Bodtger. European Respiratory Journal 2021. DOI:10.1183/13993003.01142-2021

Link: <https://erj.ersjournals.com/content/erj/59/5/2101142.full.pdf>

Physiological changes related to 10 weeks of Singing for Lung Health in patients with COPD. 2022. M. Kaasgaard, D. Bech Rasmussen, A. Løkke, P. Vuust, O. Hilberg, U. Bodtger. BMJ Open Respiratory Research 2022. DOI: 10.1136/bmjresp-2022-00120

Link: <https://bmjopenrespres.bmj.com/content/bmjresp/9/1/e001206.full.pdf>

Links til artikler om Sing-a-Lung 1.0 i lægmandssprog:

<https://videnskab.dk/krop-sundhed/sang-kan-hjaelpe-kol-patienter-med-at-faa-vejret/>

<https://www.luftspejlet.dk/luftundersangensvinger>

Forskningsprofil:

Info om artikler, projekter, medvirken/omtale i presse m.m.:

Research profile: <https://portal.findresearcher.sdu.dk/en/persons/mkaasgaard>