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Guest Editors
Mike White
Margret Meagher
Sarah Atkinson

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International perspectives on the development of research-guided practice in community-based arts in health

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ABOUT THE E–JOURNAL

The UNESCO Observatory refereed e-journal is based within the Graduate School of Education at The University of Melbourne, Australia. The journal promotes multi-disciplinary research in the Arts and Education and arose out of a recognised need for knowledge sharing in the field. The publication of diverse arts and cultural experiences within a multi-disciplinary context informs the development of future initiatives in this expanding field. There are many instances where the arts work successfully in collaboration with formerly non-traditional partners such as the sciences and health care, and this peer-reviewed journal aims to publish examples of excellence.

Valuable contributions from international researchers are providing evidence of the impact of the arts on individuals, groups and organisations across all sectors of society. The UNESCO Observatory refereed e-journal is a clearing house of research which can be used to support advocacy processes; to improve practice; influence policy making, and benefit the integration of the arts in formal and non-formal educational systems across communities, regions and countries.

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International perspectives on the development of research-guided practice in community-based arts in health

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THEME

Health has become a recurrent topic in discussion of the role of the arts in society, fuelled by a growing body of research into links between culture and flourishing. In community arts in particular there has been a widespread development of projects addressing health issues. This is a distinct area of activity operating mainly outside of acute healthcare settings and is characterised by the use of participatory arts to promote health. There are indications that this work is developing in response to health needs of communities in differing cultures and healthcare systems around the world, but so far there is little mutual knowledge or connection of the work at an international level.

This issue aims to draw together well-researched case studies of community-based arts in health projects from different parts of the globe. Each case study should explain the motivation for the work undertaken and its sensitivity to context and cultural diversity, the partnership structures and ethos developed in its delivery, and the research methodologies used. Submissions are particularly invited that reflect multidisciplinary knowledge of the application of arts development to health and flourishing communities from the perspectives of applied arts, public health, anthropology, social geography, education and other disciplines.

A UK feasibility study on the value of singing for people with Chronic Obstructive Pulmonary Disease (COPD)[1]

Dr Ian Morrison FRSPH FRSM
Sidney De Haan Research Centre for Arts and Health
Canterbury Christ Church University
University Centre Folkestone, UK

Stephen Clift, Sonia Page, Isobel Salisbury,Matthew Shipton,
Ann Skingley, Trish Vella Burrows
Sidney De Haan Research Centre for Arts and Health
Canterbury Christ Church University, UK

Simon Coulton *Centre for Health Services Studies, University of Kent, UK*
Pauline Treadwell *Kent Community Health NHS Trust, UK*

ABSTRACT

Aim

To explore the feasibility of weekly community singing for people with COPD and to assess impact on lung function, functional capacity, breathlessness, and quality of life.

Method

An uncontrolled observational study of a weekly group singing programme was undertaken over the period September 2011 to June 2012. The St. Georges Respiratory Questionnaire (SGRQ), MRC breathlessness scale, EQ-5D and York SF-12 were administered at baseline, mid-point and end of study, and spirometry to assess lung function at baseline and study end.

Results

Health-related quality of life assessed by SQRG showed a 3.3 point change in the direction of health improvement. Improvements were also found in FEV1 %, FVC and FVC%.

Conclusion

Health improvements are encouraging as COPD is a progressive illness and a decline in health would be expected over ten months. The study provides a good foundation for designing a more robust controlled community trial.

KEYWORDS

COPD, SQRG, Respiratory Health Promotion, Singing, Applied Arts, Pulmonary Rehabilitation

INTRODUCTION

THE NATURE AND PREVALENCE OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

COPD is an umbrella term for a number of specific conditions (primarily bronchitis and emphysema) leading to irreversible airflow obstruction. Diagnosis relies on a combination of history, physical examination and confirmation of airflow obstruction using spirometry (NIHCE 2010). Four stages of COPD severity can be distinguished– mild, moderate, severe and very severe based on the amount of air an individual can forcefully expel from their lungs in one second (FEV1)(GOLD 2010). Mild COPD is indicated by an FEV1 of 80 per cent or more of expected values, moderate by an FEV1 of <80 per cent and >50 per cent, severe by an FEV1 of <50 per cent and >30 per cent of expected values for age and sex, and very severe COPD by an FEV1 value of <30 per cent. The most common debilitating symptom of COPD is breathlessness (Dewar and Curry, 2006), which often leads to inactivity, isolation and dependence. Pulmonary Rehabilitation can improve physical activity and quality of life, although the benefits depend upon continued adherence to physical activity (BTS/BLF 2002). COPD is associated with other, often smoking-related long-term health conditions including cardiovascular disease, osteoporosis and depression (Fletcher et al. 2010). As Jones (2009: 4) notes COPD is characterised by 'a spiral of decline': 'As COPD progresses, patients fail to exercise, feel depressed, and experience low self-esteem.' In England, approximately 835,000 people have been diagnosed with COPD, but the true prevalence is likely to be over 3 million (DH 2010). In an average UK health district of 250,000 people, GPs will have 14,200 consultations a year from patients with COPD and 680 patients will be admitted to hospital (BTS/BLF 2002). Exacerbation of COPD is the second most common cause of emergency admissions to hospitals in the UK and one of the most expensive conditions treated by the NHS (BLF 2007) with direct costs of £810-930 million per year, which are expected to rise (DH 2010). COPD mainly affects people beyond retirement age, but 24 million lost working days a year are due to COPD (BTS/BLF 2002). The Department of Health consultation on a strategy for COPD in England (DH 2010) highlighted the need to improve prevention efforts, support early identification, ensure accurate diagnosis and ensure high quality care of people with the disease and at the end of

life. The strategy lays particular emphasis on the third sector taking responsibility for contributing to service change and improvement.

Innovative, cost-effective initiatives are needed to help people with COPD engage in physical and social activity to support independence and quality of life. This study explores the value of regular group singing in promoting wellbeing. Currently this is an under-researched field. Surveys have shown that choral singers believe that singing improves their breathing (Clift and Hancox 2001, Clift et al. 2009) but comparison of lung function in professional singers versus wind and percussion players, failed to show significant differences in standard spirometric parameters (Clift et al. 2008). There is some evidence, however, that group singing may be beneficial for people with chronic respiratory disease by modifying breathing patterns, reducing breathlessness, and improving quality of life and social and psychological wellbeing. Macklem (2010) has recently argued that basic considerations of the pathophysiology of COPD suggest that encouraging patients to breathe slowly and deeply during exercise, and avoid rapid upper thoracic patterns of breathing, should help to lessen dyspnoea and improve performance.

Engen (2005) recruited participants from a gerontology clinic and pulmonary rehabilitation clinic who had a diagnosis of emphysema. Twelve participants met in small groups twice a week for six weeks. None of the physical health and quality of life measures employed showed improvements over the six weeks of the study, but measures of breath control and voice intensity both improved significantly. In addition, breathing mode changed from being predominantly clavicular to being diaphragmatic in all cases and this was maintained for two weeks after the treatment sessions ended.

Bonilha et al. (2008) report a small randomised controlled trial assessing the impact of singing groups on lung function and quality of life among patients diagnosed with COPD. This study randomised 43 patients to a programme of singing or handcraft classes. Fifteen participants in each group completed 24 sessions and were comparable at baseline in their mean FEV1 per cent predicted values (singing group 48.8; control group 53.4). The singing group showed a small improvement in a measure of maximal expiratory pressure at the end of the study, while the control group showed a larger decline, with the difference being statistically significant. Both groups showed increased quality of life scores with no significant difference, emphasising the benefits of group participation for perceived quality of life.

Two small trials examining the effects of singing lessons for patients with COPD have been completed at the Royal Brompton Hospital, London. In the first (Lord et al. 2010) thirty-six COPD patients were randomised to either 12 one-hour sessions of singing lessons over six weeks, or usual care. Following attrition 15 patients in the singing group (mean baseline FEV1 per cent predicted 36.8) were compared with 13 controls (mean baseline FEV1 per cent predicted 37.7). Significant improvements were found in levels of anxiety and self-assessed physical wellbeing in the singing group. No differences were found between the groups for 'single breath counting, incremental shuttle walking test (ISWT) scores or recovery time following ISWT and intriguingly breath-hold time increased more in the control group than the singing group. In the second study (Lord et al. 2012) 33 patients with COPD participated in either 16 sessions of singing over eight weeks (mean FEV1 per cent

predicted 44.4), or an active control condition in which participants watch films together and discussed them (mean FEV1 per cent predicted 63.5). Although the mean FEV1 per cent predicted value was higher for the control group, this difference was not statistically significant. Follow up assessment showed that the singing group improved significantly in self-assessed physical health compared with the control group, but no differences emerged in direct measures of lung function.

To date, therefore, research on singing and COPD has been limited, with small sample sizes and short interventions in clinical settings focused on the teaching of singing. While existing research has shown that singing is an acceptable activity for people with COPD and that it can have general wellbeing benefits, little or no improvement in measures of lung function have been found. It may be that the interventions have not been long enough, and indeed, the increase in singing sessions between the two Royal Brompton studies from 12 to 16 singing sessions was motivated by a concern that the earlier study was too short to reveal positive benefits. It may be that even the increase to 16 sessions was still insufficient to promote measurable improvements in breathing and lung function. In addition, the groups in the Brompton study were small and individuals may not have experienced the support in singing that comes from being part of a larger choir, nor the impetus to improve that comes from preparation to perform. The present study addresses the limitations of previous research through a community-based singing initiative for people with COPD. A larger group of participants was recruited than in previous studies, and six community singing groups were established meeting weekly over a longer period of time. In addition to teaching good posture, breathing techniques and engaging in singing, the groups worked towards combined performance events in line with a widely followed model of community singing.

METHOD

The UK Medical Research Council (MRC, 2008) has set out a framework for the development and evaluation of complex interventions. This study represents the modelling stage in the framework and is necessary to establish the potential for effectiveness and cost-effectiveness, the nature of the likely effect sizes and the feasibility of the intervention in normal clinical community practice.

AIMS

The study is a quasi-experimental pilot evaluation of the potential feasibility, acceptability, effectiveness, and cost-effectiveness of regular singing for people with COPD.

OBJECTIVES

Specific objectives of the study were to provide evidence relating to:

i. The effect of participation in regular singing on clinical measures of COPD.

ii. The effect on measures of health related quality of life.

iii. Interactions between demographic and clinical factors that may impact on observed outcome.

iv. Recruitment and retention rates and preferences for singing as an intervention in this population.

v. Costs associated with delivery of the intervention and costs (savings) associated with the intervention in order to model the potential cost-effectiveness of the intervention.

vi. Patient satisfaction with the intervention (measured by questionnaire and explored by interview).

DESIGN

A non-randomised quasi-experimental design was employed. Following the National Institute of Health and Clinical Excellence guidelines on 'person-centred care' in COPD (NIHCE 2010), this study recruited individuals into singing groups who express a preference for participating in this activity. A 'usual care' comparison group was offered to individuals meeting the same inclusion criteria, who were willing to participate in the study, but who did not wish to sing. However, all participants chose to join the singing groups. Six singing groups were established in or near Ashford, Whitstable, Dover, Deal, Canterbury and Ramsgate in the county of Kent, South East England. These are areas known to have a high prevalence of COPD (Whitmore and Limentani 2009).

ETHICAL APPROVAL

Ethical approval was given by the Faculty of Health and Social Care Research Ethics Committee of Canterbury Christ Church University and Oxford C NHS Research Ethics Committee. The study was conducted in accordance with MRC good practice guidelines (MRC 2005) and the Declaration of Helsinki (Declaration of Helsinki 1964).

RECRUITMENT

A variety of methods of recruitment were pursued, including a mailed invitation to patients on the COPD registers within GPs practices serving East Kent, newspaper advertisements and direct contact with three local support groups for people with breathing difficulties (British Lung Foundation Breathe Easy Groups).

Inclusion criteria

i. Mild, moderate, severe or very severe COPD as assessed by post-bronchodilator spirometry at baseline

ii. Physically mobile and able to travel to sessions independently or with the support of a carer

iii. Able to speak and hear and willing to commit to participating in the project over the course of 18 months (health permitting)

iv. Able to speak English and complete questionnaires in English

v. Aged 18 years and over

Exclusion criteria

i. Severe dementia or other cognitive or communication disabilities which renders consent problematic

ii. Severe co-morbidities which contra-indicate participation on the advice of GPs

SAMPLE SIZE

The aim of the study was to provide evidence of potential effectiveness and cost-effectiveness prior to embarking on a larger randomised controlled trial. We estimated that 100 participant singers would be sufficient for the study with a conservative estimate of 50 per cent of these being followed up at the conclusion of the singing programme. This would provide a sufficient number of participants to provide estimates of effect sizes on the outcome measures employed to be used in sample size and power calculations for a subsequent trial.

MEASURES

The following measures were used to assess outcomes for lung function, COPD specific and generic health-related quality of life:

Lung function

Spirometry was carried out by a qualified health professional, to assess FEV1, FEV1%, F VC, and FVC% both before and at the end of the project post bronchodilation.

Lung function data was obtained using a Micro Medical (Care Fusion) MicroLab machine, which is a portable device that uses a turbine sensor to measure air flow. It was chosen as is popular within Primary Care and Community settings in the UK as it is portable as well as meeting published recommendations of European Respiratory Society (ERS) and American Thoracic Society (ATS) (Miller et al. 2005). Before each assessment session the device was calibrated with a 3 litre calibration syringe.

Participants were assessed before each spirometry session to ensure their health was satisfactory prior to commencement of the manoeuvres and no contra-indications identified. If necessary the test was deferred and rescheduled to another session. The person's demographic information was inputted into the machine as well as their height and weight.

Subjects performed the manoeuvre in a sitting position. The test was carried out following the procedure specified within the Clinical Protocol for Spirometry

used by the Kent Community Health NHS Trust. This is based on national and international guidance (Levy et al. 2009, Association of Respiratory Technology and Physiology (ARTP, 2006) and the Global Initiative for Chronic Obstructive Lung Disease (GOLD, 2010)).

The appropriate technique was demonstrated for both relaxed and forced blows and the person was coached throughout the performance of the test. Verbal encouragement is important as this ensures continuation of exhaling air at the end of the manoeuvre. The equipment indicates whether the person has reached a plateau and performed the test well, which the technician observes during the procedure. The test would be terminated if discomfort is experienced or not performed correctly. Three acceptable manoeuvres of each relaxed and forced spirometry was the gold standard aim with a maximum of 8 blows per session. Quality criteria of the manoeuvres were through the British Thoracic Society (BTS 1997) and the predicted values of the European Community of Coal and Steel (Quanjer et al. 1993) were utilised; these values are widely used in Europe and appropriate for use with this population.

The stage of COPD was defined by the FEV1 per cent following the GOLD (2010) and NIHCE (2010) guidance.

St. George's Respiratory Questionnaire (SGRQ)

A self-assessed measure of health impairment employed in research on chronic respiratory illness and COPD. Four scores are produced: symptoms, activity, impacts and total (SGRQ 2008).

MRC Dyspnoea Scale

A 5-point self-rated breathlessness scale for patients with lung disease (Bestall, et al. 1999; Stenton 2008).

York SF-12

A self-assessed health related quality of life measure (Iglesias et al. 2001) validated for use with older people and for which population norms exist. The twelve multiple choice questions cover both physical and mental domains of health.

EuroQol-5D (EQ-5D)

A short, 3-level, 5-dimensional instrument which provides a health utility score (from 0 – 1), and a self-assessed overall rating of health using a 0-100 visual analogue scale (VAS) (Euroqol Group 1990). EQ-5D also allows the generation of Quality Adjusted Life Years and is widely used in the economic evaluation of health care and recommended for cost-effectiveness analyses (not reported on here).

SGRQ, EQ-5D and SF-12 have been shown to relate well in a study of quality of life in patients with severe COPD hospitalised for exacerbations (Menn et al. 2010). Generic quality of life as assessed by EQ-5D differentiates between stages of COPD severity (Rutten-van Mölken et al. 2006). The MRC scale has been shown to provide a valid means of categorising levels of disability in COPD patients (Bestall et al. 1999). In studies measuring quality of life of patients with COPD it is recommended that both the clinically specific SGRQ and more generic measures are used (Daudey et al. 2010).

Participants completed spirometry and the battery of questionnaires at baseline. Questionnaires were completed at mid-study and study end, and spirometry undertaken at study end.

Statistical analysis was performed using SPSS version 19. Change in quantitative outcome measures between baseline and post singing programme was assessed using paired t-tests (two-tailed with a 5 per cent criterion for significance).

THE INTERVENTION

Singing groups were led by skilled and experienced singing leaders. The facilitators received five days training and met regularly throughout the project to ensure a broadly consistent approach. Facilitator training for the role was by the Musical Director, with some input from outside trainers. Singing sessions were weekly during academic term time, from September 2011 – June 2012. Sessions were held in community halls which were booked specifically for the event, were private and afforded acceptable levels of comfort (heating, light, ambient sound, tea making, etc.) with close integral car parking and flat access to the hall on the ground floor. Sessions were delivered to groups ranging in size from 20 to 50, including supporters (40% supporters on average). Supporters were health staff or voluntary organisation staff, carers, partners, friends or family members of the person with COPD, who also attended the groups to provide support. Singing groups took place over a total of 36 weeks including workshop/performance events at the end of each term. Sessions were a total of 90 minutes. Thirty minutes were for socialising during the 'meeting and greeting' phase, and clearing away after singing. The 60 minute singing session commenced with 20 minutes of relaxation, posture, breathing and vocal exercises followed by 40 minutes singing. A wide common repertoire of familiar and new songs was available in a high quality song book. Participants also steered the musical direction of their group according to their interests. Keeping the programme fresh, enjoyable, stimulating and stretching is essential for a project planned to run over the course of ten months. Songs were taught by ear and were sung mainly without accompaniment (Robb et al. 2011). Figure I is an image of members of the singing group established in Whitstable.

Figure I: The Whitstable Singing Group performing at St Gregory's Music Centre, Canterbury Christ Church University, March 2012

RESULTS

The study was designed to provide initial evidence on whether regular group singing benefits COPD patients' quality of life and control of breathlessness and evidence on potential cost savings associated with singing groups as an intervention (not reported on here). A network of six singing groups for patients with COPD was successfully established and maintained over the period of ten months.

RECRUITMENT

Of the 145 GP practices contacted in June 2011 in East Kent by the South East Primary Care Research Network (PCRN-SE), only six practices sent out letters to 499 patients, even though practices were offered payment to do so by the PCRN-SE. Of the 106 patients recruited via all routes, 41 were registered with one of the six practices (this would represent an 8 per cent response rate if all of those registered with these practices volunteered on the basis of receiving a letter). The rest (65) were recruited through additional routes: the East Kent Community Respiratory Team , newspaper advertising, and direct contact with the three British Lung Foundation Breathe Easy Groups in East Kent.

SAMPLE

Of the 126 people who volunteered to participate in the study, 121 attended for baseline assessment during which questionnaires were completed and standard spirometry administered. Fifteen (12.3 per cent) volunteers were found not to meet the inclusion criteria for COPD, and were excluded from the study, but not from participating in a singing group. The sample of 106 participants with COPD varied in the severity of their COPD with 15 per cent mild, 45 per cent moderate, 30 per cent severe and 10 per cent very severe. The mean age of the sample was 69.5 (SD 7.64) with a third being male. The majority of participants were retired (75.1 per cent), with 14 (13.5 per cent) who retired due to the effects of COPD. The majority of the sample were previous smokers (69.5 per cent); 11.4 per cent currently smoked, and 19.0 per cent had never smoked. Ninety-nine percent considered themselves white, and 51.4 per cent had continued in education, with over a third holding a degree or equivalent qualification. The majority had a joint income with partner of less than £20k (83.0 per cent), and 36.2 per cent less than £10k jointly. Over the course of the study 34 (32.1 per cent) participants withdrew because of competing commitments and health problems. In only three cases, however, were the health issues related to COPD. Three of the singing groups formed were fairly large, with an average of 26 members, and three were smaller, with an average of 9 members. The larger groups were in areas where a Breathe Easy support group operated.

ASSESSMENTS OF LUNG FUNCTION

Table I reports the results from the spirometry undertaken at baseline and the end of the singing programme. Significant improvements were found for FEV1 per cent, FVC and FVC per cent.

Table I. Measures of lung function at baseline and end of programme

Measure	n	Baseline	End of Programme	Mean difference (95% CI)	p value
FEV_1	66	1.29 (0.49)	1.32 (0.51)	0.03 (–0.01; 0.58)	0.094
FEV_1% predicted	67	54.34 (20.45)	56.28 (21.98)	1.94 (0.58; 3.30)	0.006
FVC	64	2.43 (0.75)	2.54 (0.75)	0.11 (0.01; 0.20)	0.027
FVC% predicted	65	81.72 (22.60)	85.35 (21.70)	3.63 (0.28; 6.98)	0.034

SELF–ASSESSED HEALTH

Participants in the study completed a battery of questionnaires at baseline, mid-point in study and at the end of the programme. No significant changes were found between baseline and mid-point assessments on any measure. Table II reports the results from the St. George's Respiratory Questionnaire, MRC breathlessness scale, EQ-5D and SF-12 for baseline and the final assessment.

Significant improvements emerged for the SGRQ total and impacts scores between baseline and the end of the programme. No significant changes were found, however, for breathlessness assessed by the MRC scale, nor for generic measures of mental and physical health-related quality of life as measured by York SF-12 and the EQ-5D.

Table II. Measures of self–assessed health at baseline and end of programme

Measure	n	Baseline	End of Programme	Mean difference (95% CI)	p value
SGRQ total	71	48.71 (16.95)	45.42 (16.96)	–3.29 (–6.14; –0.45)	0.024
SGRQ symptoms	71	59.16 (23.49)	56.04 (22.05)	–3.13 (–7.35; 1.08)	0.143
SGRQ activities	71	65.46 (22.41)	63.33 (22.14)	–2.13 (–5.44; 1.18)	0.204
SGRQ impact	70	35.65 (17.56)	32.21 (15.90)	–3.45 (–6.77; –0.13)	0.042
MRC dyspnoea	68	2.68 (0.98)	2.54 (1.03)	–0.13 (–0.34; 0.08)	0.210
EQ–5D utility score	65	0.71 (0.22)	0.75 (0.22)	0.04 (–0.01; 0.08)	0.152
EQ–5D VAS	65	65.61 (17.96)	68.86 (18.99)	3.24 (–1.2; 7.68)	0.150
SF12 mental	65	53.48 (9.87)	54.99 (9.06)	1.50 (–0.90; 3.91)	0.216
SF12 physical	65	28.91 (7.98)	28.82 (7.87)	0.09 (–1.14; 1.33)	0.882

QUALITATIVE FEEDBACK FROM PARTICIPANTS

Participants had the opportunity to write comments about their experience of the project and their health on the questionnaire. At the end of the project, the large majority gave comments pointing to the social, psychological, and physical health benefits they experienced from taking part. The main themes expressed in written comments were:

- Enjoyment and improved wellbeing
- Social benefits and peer support
- Wanting the singing groups to continue
- Improvements in breathing, breath control and physical health
- Facilitation and the programme of the singing groups, and singing improvement

The following examples are typical of the comments made by participants, and highlight the benefits experienced from singing, especially in relation to control and ease of breathing.

'Standing to sing helps posture, you think "upright" automatically as this gives maximum output from your lungs. The relaxation exercises do just that, and learning to breathe bringing the muscles of the abdomen into play, as well as controlled exhalation, has helped me enormously.'

'This is the first winter I have not had to call an ambulance or be on several lots of antibiotics and have taken only maintenance doses of steroids. This maybe a coincidence or it may be better because of the breathing help we have received.'

'Helped mentally and physically. Somewhere to go with like-minded people. Have not for the first time in five years been admitted to hospital or casualty over the winter period. Opened up doors i.e. joining the (BLF) Breathe Easy group.'

'I have enjoyed the project the singing has help me to understand how breathing and singing can help me to breathe better.'

'I believe that the project is teaching me how to understand my breathing and how to control it. This is very useful; it stops me hyperventilating when my breathing is under pressure i.e. climbing a steep hill.'

'Have enjoyed being in project and liked the singing bit. I gave up going to the gym as found the singing exhausting and as good as exercise.'

DISCUSSION

RECRUITMENT

It was possible to recruit over a hundred COPD patients to a community singing project. However, participation by GP practices in this process was limited, even though they were offered payment to do so. This has recruitment implications for future larger-scale controlled studies on singing and COPD, and the ability to build an evidence base. The six practices that took part varied from large businesses with dedicated research support, to single GP practices with minimal administration support. Discussions with Practice Managers revealed that in large Practices, it could take up to 3 months to gain agreement from GPs to take part in research. This issue will be built into future study design timelines, including more attention to involving GPs in the design and recruitment processes initially. This will also be useful in explaining to GPs the expected benefits of the study to them, and gaining their support. Also influencing recruitment was the presence of a BLF BEG in the geographic area of the larger groups. The influence of the three BLF BEGs was due to the encouragement possible by presenting the project to the members at their monthly meeting, and the consequent peer support received. East Kent has an excellent Community Respiratory Team, and they informed patients on their lists, and also those taking part in PR. Members from the BEGs visit the PR Groups to promote the local BEG, and they also promoted the singing groups as well. Advertising in the local papers was also successful for harder to reach people, but was relatively expensive on a per head basis.

ATTRITION

Over the course of the study a total of 34 participants left the study and did not complete the final questionnaire (32.1 per cent attrition). A further six participants were unable to attend for the final spirometry assessments due to other commitments and illness (37.7 per cent attrition). The rate of loss to the study is less than the conservative estimate of 50% made in designing the study and considering the length of the study compares well with attrition rates in previous studies of singing and COPD (Bonhila et al, 2009, 30 per cent over 24 weeks; Lord et al, 2010, 22 per cent over six weeks; Lord et al, 2012, 19 per cent over eight weeks). Comparisons were made between those dropping out and those remaining in the study and no significant differences emerged on any measure taken at baseline, so attrition did not introduce bias into the study. In addition, only a small number of withdrawals (2.8 per cent) were due specifically to COPD related health issues, and only a small proportion of missed attendances during the programme were due to COPD related health issues (1.5 per cent). This indicates that participants seemed to have stayed generally quite well and active whilst participating in weekly singing. Qualitative evidence (see quotations 2 and 3 above) also indicates that some participants had not been as ill as in previous years during the particularly harsh winter of 2011, when GPs were warned by the UK Department of Health to expect increased illness rates in COPD patients (DH, 2011).

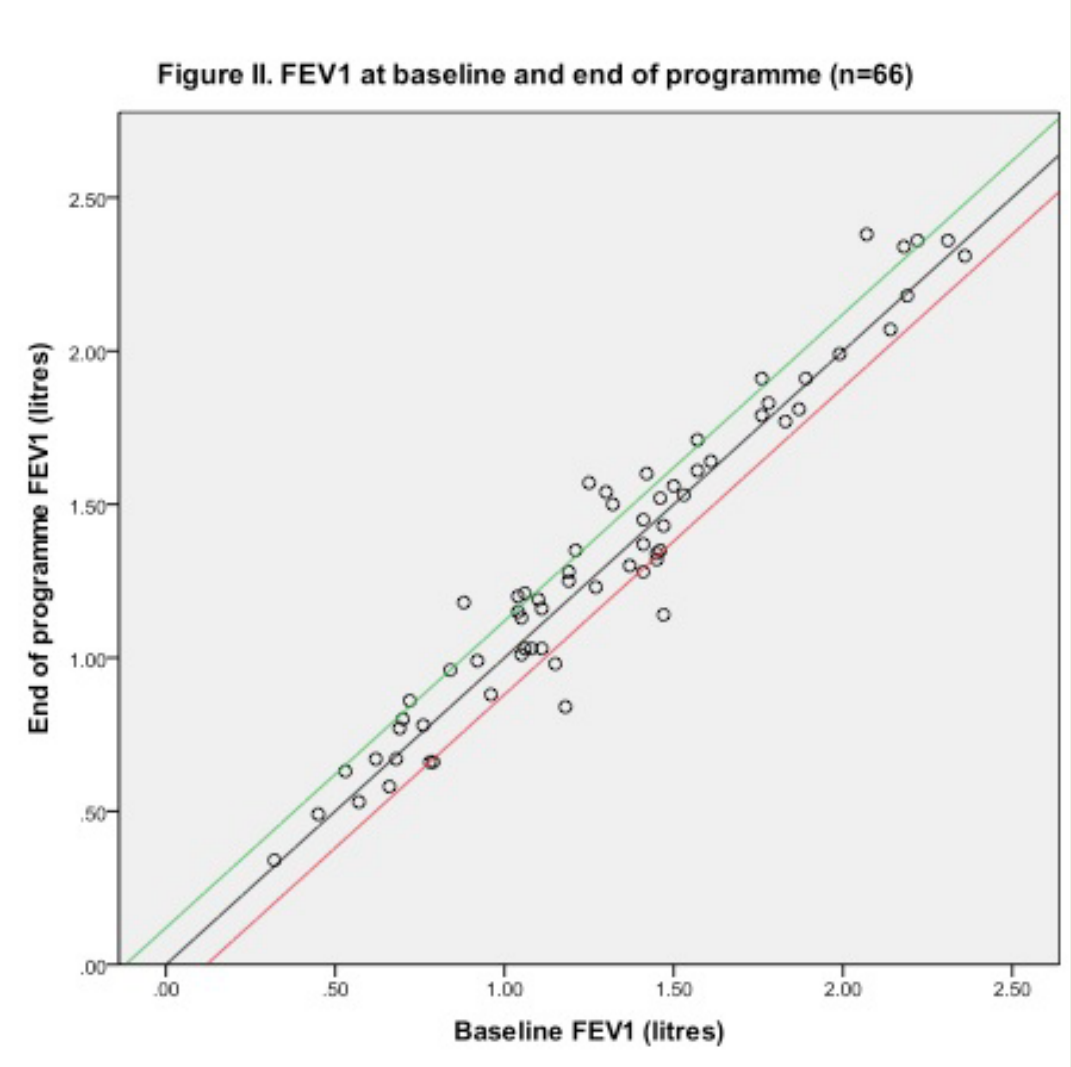
RELIABILITY AND CONSISTENCY OF HEALTH MEASURES

Correlations between baseline and end of programme assessments were very high for spirometry measures (e.g. FEV1, r=0.97 to FVC per cent, r=0.81). Test-retest correlations for self-rated health status measures were also moderate to high (SGRQ total, r=0.76, MRC, r=0.63, York SF-12 physical, r=0.78, mental, r=0.43, EQ-5D health utility, r=0.56, EQ-5D thermometer, r=0.49) with the lowest correlations for the mental component of York SF-12 and the EQ-5D measures. Correlations between the percentage adjusted lung function measures and SGRQ total score were negative and significant at baseline, but small (FEV1 per cent, r=-0.29, FVC per cent, r=-0.25). Inter-correlations between health status measures at baseline showed a reassuring pattern of consistency (e.g. SGRQ total/EQ-5D thermometer, r=-0.62, SGRQ total/ York SF-12 physical component, r=-0.64).

IMPROVEMENTS IN LUNG FUNCTION

The positive improvements in the standard spirometry measures are encouraging findings, especially given that a decline in these measures might have been expected given that COPD is a deteriorating disease. While the improvement for FEV1 was 30ml. and not statistically significant, Dewar and Curry (2006) suggest that after 25 years of age, a non-smoking adult's FEV1 declines each year by an average of 20-40 ml. and that in susceptible smokers this decline can be as much as two to five times greater. It should also be noted that the 30 ml. change was an average for the whole sample, and that some participants made greater changes. Recent evidence suggests that improvements of 120 ml. or more in FEV1 are associated with clinically significant improvements in perceived health status measured by the SGRQ (Jones et al, 2011; Jones, personal communication). Figure II shows the relationships between FEV1 at baseline and following the end of the singing programme. The central line represents no change, the upper line improvements from baseline of 120 ml. and the lower line declines of 120 ml. from baseline. While seven people showed deterioration of 120 ml. or more over the course of the study, no fewer than 16 people showed an improvement of at least 120 ml. beyond baseline.

Figure II. FEV1 at baseline end of the programme (n=66)



While the FEV1 change is not statistically significant, FEV1 expressed as a percentage of expected values (taking account of age, gender, body-mass index and ethnicity) does show a clearly significant improvement of almost 2 per cent. This reflects the fact that despite the participants being almost one year older, their FEV1 has improved. Interestingly, both FVC and FVC per cent have also improved. As FEV1 cannot exceed FVC, and increased FVC can be regarded as an indicator of reduced gas-trapping (Macklem 2010), the changes in FVC seen may be of greater clinical and functional significance than changes in FEV_1.

ST. GEORGE'S RESPIRATORY QUESTIONNAIRE

The finding of an improvement in the total SGRQ score was encouraging. While the change of 3.3 is less than the accepted minimal clinically significant change value of 4, the change was statistically significant. Over time a rise in SGRQ (health decrease) of approximately two points annually is to be expected given that COPD is a progressive illness (Jones, personal communication, 2012). The improvement in SGRQ is also consistent with the improvements found in the lung function measures (Jones et al, 2011).

MRC DYSPNOEA SCALE

The mean MRC rating showed some slight improvement, but the change was not significant. The correlations between the MRC scale and SGRQ total at baseline and end of programme were 0.68 and 0.54 respectively. While positive and significant, these correlations are moderate. Breathlessness is part of a more comprehensive self-assessment given by the SGRQ and appears to be more sensitive to change than the MRC scale.

YORK SF–12 PHYSICAL AND MENTAL WELLBEING

SF-12 showed mental health was good, but physical health was poor, and no change was found in either over the period of the study. The lack of change in the physical component of the York SF-12 contrasts with the positive changes found by Lord et al. (2012) in the physical health component assessed by the SF-36. It may be that the longer instrument is more sensitive and detected changes that the York SF-12 did not. Previous studies on singing have shown improvements in mental health and wellbeing for mental health service users (Clift and Morrison, 2011), and for older people over 60 years old (Skingley et al. 2011; Clift et al. 2012). However, mental health was quite good amongst the current sample of COPD patients, and conversations with participants when they were attending to complete questionnaires, revealed they were in good spirits and had adjusted to their condition. This may explain the lack of change in their mental health status.

EQ–5D

As with the York SF-12, measures from the EQ-5D did not show significant change over the course of the study. While EQ-5D utility and VAS scores can differentiate groups of patients with severe and very severe COPD, they appeared to lack sensitivity in the current study to detect changes in response to the singing intervention.

STUDY LIMITATIONS

The current study was designed to assess the feasibility and acceptability of establishing and running community singing groups for people with COPD over the course of almost a year, and to gather data on changes which would allow calculation of effect sizes and needed sample size for a subsequent randomised controlled trial. All of the feasibility and acceptability questions related to recruitment and project delivery were positively answered, and the data gathered provide a sound basis for designing a controlled trial with respiratory function and COPD specific health status as primary outcome measures. In the current study participants volunteered on the basis of information received through a variety of channels, and was thus non-representative of the wider population of people with COPD in the geographical area covered (East Kent). In addition, the sample was biased due to: gender (mainly female), ethnicity (white), social class (working/middle class, some ex-coal miners), and education (Further/University). A further randomised controlled study will need to establish whether people with COPD willing to take part in singing activity differ from those who are not.

IMPLICATIONS

The improvement in FEV1 per cent, FVC and FVC%, and SGRQ suggests that the singing programme followed, including the attention paid to posture and breathing technique, may have an exercise training effect on lung function. Lung function is an important aspect of health, ensuring efficient evacuation of the lungs and providing the oxygen supply to the circulation system. As singing can be performed sitting down, it is suitable for almost anybody. This enables a training regimen to be individually graded both by varying the position of the participant, e.g. sitting, standing, or walking around, and the exposure to the graded singing delivery of the vocal exercises and song difficulty. Therefore it could be classed as a form of moderate cardio-vascular exercise suitable for all. This aspect is being discussed with the Community Respiratory Team in East Kent with a view to integrating some singing within PR provision, but also as an option for those not able to take up PR, for those on the waiting list for PR, and also as a post-PR maintenance activity.

CONCLUSIONS

The improvement in FEV1 per cent, FVC and FVC per cent indicates that community singing (including attention to posture and breathing techniques) can have an exercise training effect on the lung function of people with mild to very severe COPD. Singing could be considered as a form of moderate cardio-vascular exercise for this group of chronically ill patients and as such is worthy of attention from Health Service Pulmonary Rehabilitation Teams, Respiratory Nurses, Health Promotion Services, and voluntary organisations working to support people with COPD in the community.

The success of this study indicates the need for a larger-scale controlled study on community singing and COPD. A further planned study will pay more attention to processes of recruitment into the trial to assess the factors associated with willingness to participate in singing groups among people with COPD.

NOTES

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