

Effect of a Motivational Interviewing-Based Health Coaching on Quality of Life in Subjects With COPD

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BACKGROUND: Improving quality of life (QOL) is a key goal in the care of patients with COPD. Pulmonary rehabilitation (PR) has clearly been shown to improve QOL, but is not accessible to many eligible patients. There is a need for alternative programs designed to improve patient well-being that are accessible to all patients with COPD. Our goal was to pilot test a simple, telephone-based health-coaching intervention that was recently shown to decrease readmission among hospitalized COPD patients and stable COPD patients eligible for PR. **METHODS:** Subjects received a 3-month intervention consisting of 10 health-coaching telephone calls based on motivational interviewing principles. Outcome measures included dyspnea level, measured by the modified Medical Research Council scale, and QOL, measured by the Chronic Respiratory Questionnaire and a single-item general self-rated health status. **RESULTS:** Fifty subjects with moderate to severe COPD were enrolled in the study. Forty-four subjects (86%) completed the study intervention. Dyspnea measured by the modified Medical Research Council score improved significantly after the intervention ($P = .0024$). The domains of fatigue, emotional function, and mastery on the Chronic Respiratory Disease Questionnaire and the single-item QOL question also improved significantly after the 3 months of health coaching ($P = .0012$, $P = .0002$, $P = .007$, and $P = .03$, respectively). Thirty-six (71%) subjects had a clinically meaningful improvement in at least 1 study end point (either in the severity of dyspnea or a domain of QOL). Thirty subjects (58%) had an improvement of ≥ 0.5 points, the minimum clinically important difference in at least 1 component of the Chronic Respiratory Disease Questionnaire. **CONCLUSIONS:** A telephone-delivered motivational interviewing-based coaching program for COPD patients is a feasible, well-accepted (by both participants and providers), simple, and novel intervention to improve the well-being of patients with COPD. This pilot study provides insight into a possible alternative to a conventional PR program for patients with limited access to that program. *Key words:* COPD; health coaching; health-related quality of life; health status; mMRC; motivational interviewing; physical status; pulmonary rehabilitation. [Respir Care 2017;62(8):1043–1048. © 2017 Daedalus Enterprises]

Introduction

Perception of quality of life (QOL) in COPD is a critical and clinically meaningful outcome, as it matters to the

patient and is related to health-care utilization.^{1,2} A 2007 systematic review showed that low health-related QOL was associated with an increased risk of hospitalization and rehospitalization among subjects with COPD.³ Both general and disease-specific QOL measures are independently associated with survival in models adjusted by age,

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FEV₁, and body mass index.⁴ For that reason, improving perception of health is one of the key goals of COPD care.⁵

Pulmonary rehabilitation (PR) has shown to be effective in improving the perception of health-related QOL among patients with COPD.⁶⁻⁹ Unfortunately, PR is not accessible to many eligible patients. Key barriers for enrolling into a PR program include lack of facilities within proximity, poor mobility, absence of transportation, cost of travel, inconvenient timing, and low perceived benefit.¹⁰⁻¹³ Of those patients who do enroll, a substantial number do not complete the full program because of lack of social support, depression/anxiety, illness, and comorbidities.¹⁴⁻¹⁶ Further, the lack of patient engagement and the following behavior change may explain why the benefits of PR decline to baseline at 6–12 months after program completion.¹⁷ There is a need for alternative options to PR for patients who do not have access to it.

Telehealth technology,¹⁸ internet-based self-management programs,¹⁹ home-based PR programs,²⁰⁻²² and clinic-based exercise counseling²³ have been evaluated as alternatives to PR for improving health status and dyspnea. While some methods have been effective in improving health status,^{24,25} others have not shown considerable results in symptom improvement,¹⁸ and overall, alternative programs have not been widely adopted. We recently showed in a randomized clinical trial that health coaching was beneficial in decreasing patient readmission rates and improving QOL when administered after a COPD-related hospitalization.¹ In this study, we pilot tested the effect of a simple, low-cost, motivational, interviewing-based health-coaching intervention via telephone on the QOL of stable subjects with COPD.

Methods

Participants and Recruitment

All participation was voluntary, and each subject was required to complete a written informed-consent form. The study was approved by the Mayo Clinic Institutional Review Board (Protocol #11–000356). The target population for recruitment was a convenience sample of subjects receiving out-patient COPD care who were eligible for PR at a Midwestern tertiary care center (Mayo Clinic) but were not able to come for onsite PR at Mayo Clinic in Roch-

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QUICK LOOK

Current knowledge

Pulmonary rehabilitation (PR) has clearly been shown to improve perceived quality of life, but is not accessible to many eligible patients. There is a need for alternative programs aimed at improving patient well-being that can be available to everyone. Our goal was to pilot test in out-patients with COPD, and eligible for PR, the effect of a simple, telephone-based health-coaching intervention recently shown to decrease readmission among hospitalized COPD patients.

What this paper contributes to our knowledge

A telephone-delivered, motivational, interviewing-based coaching program for COPD subjects was a feasible, well-accepted (by both participants and providers), simple, and novel intervention to improve the well-being of subjects with COPD. This pilot study provides insight into a possible alternative to a conventional PR program for patients with limited access to that program.

ester, Minnesota. Inclusion criteria were: 1) current or former cigarette smokers, as determined by social history, of at least 10 pack-years; 2) a diagnosis of COPD; 3) a Global Initiative for Chronic Obstructive Lung Disease (GOLD) II-IV classification based on spirometry in the past 24 months; and 4) eligibility for PR. Exclusion criteria were: 1) age < 18 y, or 2) a non-ambulatory status secondary to a considerable comorbidity. Subjects were recruited April-December 2011, and Figure 1 shows the flow of participants.

Study Intervention

Details of the training and fidelity to treatment have been published.²⁶ The study site had 1 dedicated coach or interventionist, a registered nurse (Mayo Clinic) trained in motivational interviewing. Each encounter, either in person or via telephone, embodied the spirit of motivational interviewing, emphasizing the participant as the expert, the willingness of the coach to listen and understand the participant, and the empowerment of the participants to adopt the behavior they think necessary for them to pursue treatment, even if it's not directly related to their pulmonary condition. Specific instruction on the use of the "Emergency Plan" is in the online repository. The book *Living a Healthy Life With Chronic Conditions*²⁷ was provided to introduce the concept of self-management. Finally, subjects were given a Stamina InMotion Elliptical Trainer (Stamina Products Inc., Springfield, Missouri) to use daily

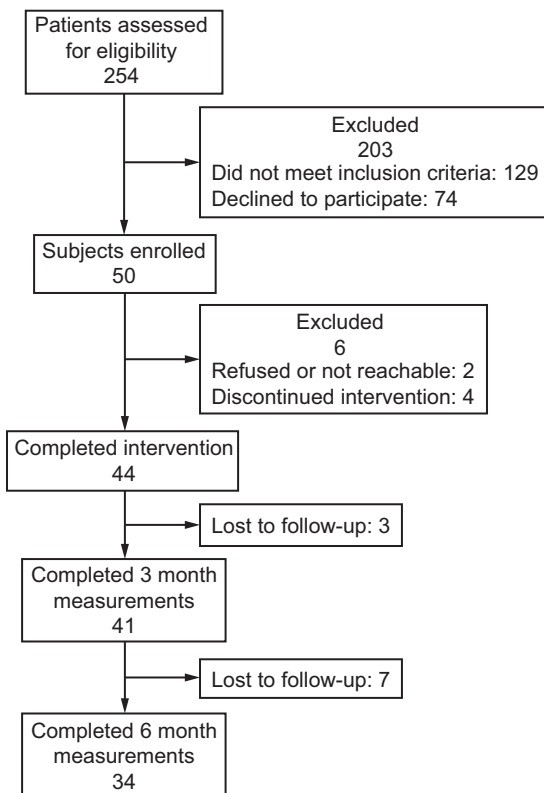


Fig. 1. Flow chart.

(while in a seated position), and instructed on 3 simple upper-extremity exercises to try. The exercise regimen was simple: All participants rehearsed the exercise with the coach and, if they were confident with the exercises and did not have O₂ desaturation, bradycardia, or tachycardia during the in-person demonstration, they could choose to participate in the study. Fall precautions were given to all participants. Each subject received 10 health-coaching telephone calls of approximately 15- to 20-min duration over 3 months (weekly calls during months 1–2, biweekly calls during month 3).

The health coach demonstrated the technique of pursed-lips breathing followed by the subject's demonstration and discussion of the breathing technique. Participants were also encouraged to call their coach if they had concerns about worsening symptoms and had to self-initiate emergency medications. The primary care provider of each participant in the intervention was engaged from the first visit and was kept up-to-date by letter. Specifics about the intervention have been published previously.^{1,26}

Measures

Demographic information was collected at the initiation of the study. Dyspnea was measured using the modified Medical Research Council (mMRC) dyspnea scale.²⁸ Dis-

ease-specific QOL was measured by the Chronic Respiratory Disease Questionnaire²⁹; composed by 4 domains: dyspnea, fatigue, emotional, and mastery, and generic QOL were measured using a single-item, general self-rated health status (GSRH) measure that asked: "Overall, how would you rate your health during the past four weeks?" Answers were given on a 5-point Likert scale (1 = excellent, 2 = very good, 3 = good, 4 = fair, and 5 = poor).^{30,31} Intervention completion was designated when participants completed 8 of 10 scheduled health-coaching telephone calls.

A post-intervention qualitative evaluation was performed on 16 randomly selected participants, evaluating subject perception of accountability, physical activity level, activity awareness, the value of communication with a coach, and barriers to exercise.

Data Analysis

Values are presented as mean \pm SD unless otherwise stated. Paired *t* tests were used to compare pre- and post-intervention values. For all tests, *P* < .05 was considered statistically significant. Excellent to poor on the GSRH measure was translated into a 1 to 5 (using the Likert scale) for analysis, with a lower score indicating a better overall health status. Clinically meaningful changes from baseline to post-intervention at 3-month follow-up were defined as a 0.5-point change for the Chronic Respiratory Disease Questionnaire domains, a 1-point change for the mMRC, and a 1-point change on the GSRH measure.

Results

We enrolled 50 subjects, 29 (57%) male, age 68.5 ± 7.7 y (mean \pm SD), who had moderate to severe disease, and FEV₁ 39 ± 15 percent of the reference value. Forty-four subjects (86%) completed the study intervention (Fig. 1).

The baseline, 3-month (post-health coaching), and 6-month changes for all the measured variables are shown in Table 1. After the health-coaching intervention, fatigue, emotional function, and mastery domains of the Chronic Respiratory Disease Questionnaire all had a statistically significant improvement. Overall health status as measured by GSRH also substantially improved. The measure of dyspnea mMRC improved post-intervention and continued to show improvement at 3 and 6 months.

Responder Analysis

After completion of the coaching sessions, 36 (71%) participants had a clinically meaningful improvement in at least 1 study end point, either mMRC (>1 point) or a domain of the Chronic Respiratory Disease Questionnaire (≥ 0.5 points). Thirty participants (58%) had a minimum clinically important difference improvement of at least 1

MOTIVATIONAL HEALTH COACHING IN COPD

Table 1. Effect of Coaching Intervention on Dyspnea and Quality of Life

Measurement Tool	Baseline	3 Months (Post-Intervention) Change	<i>P</i>	Subjects With Clinically Significant Improvement *After Intervention (%)
mMRC (scale 0–4)†	2.4 (1.0)	–0.4 (0.7)‡	.0024	27.4
CRQ Dyspnea (scale 1–7)§	4.8 (1.5)	0.2 (0.8)	.20	25.5
CRQ Fatigue (scale 1–7)§	4.0 (1.3)	0.5 (0.9)‡	.0012	33.3
CRQ Emotion (scale 1–7)§	5.0 (1.1)	0.4 (0.7)‡	.0002	31.4
CRQ Mastery (scale 1–7)§	5.1 (1.2)	0.3 (0.9)‡	.007	33.3
GSRH (scale 1–5)†	3.7 (0.9)	–0.3 (0.8)‡	.03	33.3

* One point for mMRC and GSRH, and a half point for CRQ.

† Lower value indicates best condition.

‡ Indicates statistical significance with *P* < .05.

§ Higher value indicates best condition.

mMRC = Modified Medical Research Council

CRQ = Chronic Respiratory Disease Questionnaire

GSRH = general self-rated health status: How do you rate your health: excellent, very good, good, fair or poor?

Table 2. Participant Descriptions of the Benefits of Coaching

Theme of Responses	Representative Quote
Theme 1: Participants view coaching conversations as motivating and encouraging.	To have someone there that calls you up and talks to you and encourages you to do things, not push you, just encourage. It gives you a little bit more willpower to keep going and try a little more all the time. It seemed to boost me up a little bit. Give me a little more courage. It would make me want to do it again. Do the exercise better.
Theme 2: Coaching conversations increased accountability.	Just the fact that come Thursday, I knew I would have to talk to [the coach] so I was always cognizant of keeping up with some activity, as minor as it might be, and keeping my activity log up-to-date and pedometer readings. It's like anything else you do where somebody is motivating you or checking on you. You pay a little more attention to what you are doing and you want to be able to report some progress, so it's helpful in that regard. They make sure you are doing what you are supposed to be doing.... I had somebody to report to when I accomplished or didn't accomplish.
Theme 3: Through coaching, participants gained increased awareness of health and health behavior.	Probably made me more aware of what I'm doing and not doing, or what I should be doing. It just reinforces to follow the guidelines. Try to do better, let's put it that way. It certainly made me more aware of setting some goals. Well, my general awareness of what I was doing. I became very aware of my activity levels. She gave me examples of alternative things that I could do. I guess she gave me the insight for other things. It keeps you mindful of what you are trying to do.

component of the Chronic Respiratory Disease Questionnaire, as presented in Table 1. Twenty-three (45%) participants continued to have improvement in at least 1 end point at the completion of study follow-up at 6 months.

Post-Intervention Qualitative Assessment

The participant descriptions on the benefits of coaching are described in Table 2. Several participants listed personal benefits of coaching that did not represent an overall theme, but did add additional support to the sense of acceptability of the intervention and those participants who valued coaching (eg, “I know the coach was not after me

to diet, but that was part of my goal, too: I have lost between 10–15 pounds”; “It has helped my breathing”; “It kept my spirits up quite a bit”; and “I just feel like I am stronger: My leg muscles, my arms.”).

Discussion

We found that health coaching is a feasible and acceptable intervention that, in this pilot study, produced substantial improvement in the perception of health status after intervention as measured by the Chronic Respiratory Disease Questionnaire, GSRH, and, in dyspnea, by the mMRC dyspnea scale in subjects with moderate to severe

COPD. Motivational interviewing-based health coaching has recently been considered beneficial in a randomized study of subjects with severe COPD, often preventing re-hospitalization.¹ In this pilot study, we envisioned testing a similar intervention for individuals with stable COPD who otherwise could not access PR.

We found an increase (benefit) in Chronic Respiratory Disease Questionnaire component scores of 0.2 to 0.5 points following intervention. A 0.5-point change on a 7-point scale is considered a minimum clinically important difference.³² A meta-analysis done on studies comparing traditional PR with usual care showed that scores for each Chronic Respiratory Disease Questionnaire domain improved 0.5 to 1.0 point, which is both statistically and clinically important.⁷ Our intervention had a smaller improvement but did reach the lower end of the range observed in this meta-analysis. The improvements in Chronic Respiratory Disease Questionnaire domains found in this pilot fell within the range of results seen in several home PR studies.^{22,24} Importantly, the improvement in dyspnea and the Chronic Respiratory Disease Questionnaire from our telephone-based health-coaching intervention was comparable with other studies implementing alternatives to conventional PR programs.¹⁹ We believe our results are of particular interest because our recruitment was geared toward participants who could not otherwise access PR.

Our study also showed a clinically important improvement in a third of our subjects using GSRH, a measurement of global health that other groups found to be associated with mortality, hospitalizations, and health-care utilization.^{30,31} The improvement in a generalized health measurement provides reinforcement that our intervention had positive effects on subjects' overall health status.

Our study found a sustained improvement in dyspnea as measured by mMRC. Findings are comparable with a reported internet-based intervention.¹⁹ However, results of this study were opposite of other studies, with 1 using a telehealth intervention¹⁸ that did not show such a noticeable improvement in dyspnea as assessed by the St George Respiratory Questionnaire and another using health coaching-based behavioral intervention with no improvement in dyspnea as measured by the Chronic Respiratory Disease Questionnaire.³³

Limitations

There were several limitations to our study. This was a pilot study with a small observational cohort and was not a randomized, controlled trial. Because of the nature of the study, with no in-person follow-up visits, we were not able to obtain a measurement of exercise capacity, such as a 6-min walk test. We experienced a dropout rate of 14% (participants not completing the intervention) that is comparable with prior studies.³⁴ Lack of time and the inability

to commit were commonly cited reasons for difficulty in recruiting participants.³⁵ Participants with chronic disease showed a low level of adherence to treatment recommendations.³⁶ We recognize that the improvement in the Chronic Respiratory Disease Questionnaire was not meaningful in *all* participants (despite being substantial), but given the simplicity and low-cost nature of the intervention, we believe the limitation of the telephone health coaching is acceptable (particularly considering the lack of alternative programs to improve QOL in patients who do not have access to PR).

Conclusions

We found that a telephone health-coaching intervention based on motivational interviewing was feasible. The intervention was acceptable to participants with at least moderate COPD eligible for PR, and markedly improved dyspnea and critical aspects of health-related QOL for participants with COPD. This pilot study provides an insight into possible alternatives to conventional PR for patients with limited access to those programs.

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