

RESEARCH ARTICLE

Effects of person-centred care via telephone on self-efficacy in patients with chronic obstructive pulmonary disease: Subgroup analysis of a randomized controlled trial

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Abstract

Aim: To evaluate the effects of PCC in the form of structured telephone support on self-reported cardiac self-efficacy in patients with COPD.

Methods: We enrolled 105 patients, aged ≥ 50 years, admitted to hospital and diagnosed with COPD from January 2015 to November 2016. The patients received usual care or PCC via telephone added to usual care. The Swedish Cardiac Self-Efficacy Scale comprising three dimensions (control symptoms, control illness and maintain functioning) was used as outcome measure. Data was collected at baseline, and at 3- and 6-month follow-ups.

Results: At both the 3- and 6-month follow-ups, the intervention group improved significantly more than the control group in the control illness dimension ($p = .012$ and $p = .032$, respectively). No differences were found in the other two dimensions.

Conclusions: PCC in the form of structured telephone support increases patients' confidence in managing their illness and may be a feasible strategy to support patients in their homes.

KEYWORDS

chronic heart failure, chronic obstructive pulmonary disease, nurse intervention, person-centred care, randomized controlled trial, self-efficacy, support

Trial registration: This study was retrospectively registered (ISRCTN55562827) on 30 March 2015 <http://www.isrctn.com/ISRCTN55562827>.

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1 | INTRODUCTION

The Global Burden of Disease Study estimates a prevalence of 251 million cases of chronic obstructive pulmonary disease (COPD) globally (Stanaway et al., 2016). COPD is predicted to be the fourth leading cause of death by 2030 (Mathers & Loncar, 2006). The World Health Organization (WHO) reports 3.17 million deaths globally caused by COPD in 2015 (Soriano et al., 2017; WHO, 2017). People who are diagnosed with COPD are usually in need of increased healthcare resources, particularly in primary care, due to the severity of their symptoms (Ahnfeldt-Mollerup et al., 2016). Although COPD is not curable, the right treatment and support can relieve symptoms, for example dyspnoea and fatigue and improve quality of life (McCarthy et al., 2015). The effectiveness of a therapeutic course of action relies on an agreement between healthcare professionals and patients (Bourbeau & Bartlett, 2008).

People with COPD have also been found to experience high levels of worry (Karakurt & Unsal, 2013) and to find strength in sharing their experiences and knowledge not only with Registered Nurses (RNs) and physicians but also with others in a similar situation. In addition, patients often find it difficult to access professionals who have genuine knowledge about their disease and other reliable sources of information, which may result in their feeling uncertain about how to manage their illness in daily life (Ali et al., 2017).

Self-efficacy, the belief in one's own ability to achieve a certain task, is an important concept in developing interventions for patients diagnosed with severe illness and crucial to their recovery (Bandura, 1977; Banik et al., 2018). Self-efficacy is also highlighted in PCC, and both general self-efficacy and disease- or task-specific instruments have been used to evaluate PCC interventions (Fors, et al., 2015a, 2016b). The existing disease-specific COPD self-efficacy scale (Wigal et al., 1991) focuses mainly on breathing in specific situations and not on living with the disease. Therefore, we found the Cardiac Self-Efficacy Scale (CSES) (Sullivan et al., 1998) better to measure the effect of a person-centred intervention. The CSES has been used in populations with chronic conditions such as COPD and chronic heart failure (Arnold et al., 2005) and patients living with different long-term illnesses have similar experiences in managing them.

One way to promote self-management in patients with chronic conditions is through person-centred care (PCC), which has shown promising results in patients with acute coronary syndrome and chronic heart failure (Brännström & Boman, 2014; Fors, et al., 2016b). Patients receiving PCC experience higher quality of care (Edvardsson et al., 2017). The trustful partnership between patient and health professional is emphasized in PCC and considered the pinnacle of patients' engagement in their own care (McCormack et al., 2010). Several studies have shown that providing PCC for patients with short- or long-term illness increases their belief in their own capacity to manage their illness (Fors et al., 2015a; Ventura et al., 2016). Understanding the patient's view of support is a key factor in PCC;

to improve their self-management of illness, patients need to become active partners in their own care (Ekman et al., 2011a, 2011b; Gardener et al., 2018), but to our knowledge there has been no study evaluating the effects of PCC via telephone on self-efficacy in patients with COPD (Wildevuur & Simonse, 2015).

2 | METHOD

2.1 | Aim

This study aimed to evaluate the effects of PCC via telephone on self-efficacy in patients with COPD.

2.2 | Study design

This is a subgroup analysis of a secondary outcome measure from the Care4Ourselves study, which was a randomized controlled trial (RCT) evaluating the effects of PCC in the form of structured telephone support added to usual care versus usual care alone. The study methods and procedure have been presented in detail elsewhere (Fors et al., 2018), but are briefly described below.

2.3 | Setting and participants

Patients admitted to one site in the Sahlgrenska University Hospital in Gothenburg, Sweden, were screened consecutively and enrolled from January 2015 to November 2016. Inclusion criteria for the main study were age ≥ 50 years, having a telephone and current subscription to a telephone provider and hospitalization due to worsening chronic heart failure and/or COPD. In the present analysis, only patients with a diagnosis of COPD who had responded to at least one of the dimensions in the Swedish version of the CSES (S-CSES) (Fors et al., 2015b) were included. Exclusion criteria were severe hearing and/or cognitive impairment, ongoing alcohol and/or drug abuse, no registered address in the region, survival expectancy < 1 year or participation in a conflicting study. Eligible patients were approached by an RN in the research team, given oral and written information and asked to participate during their hospital stay once their condition had been stabilized sufficiently.

Of the 1781 patients screened, 610 met eligibility criteria, but 367 of these declined to participate. The remaining 243 eligible patients were randomized to either usual care or usual care and PCC in the form of structured telephone support. Randomization was based on a computer-generated list, which was stratified for age ≥ 75 and diagnoses. Of the randomized patients, 6 were excluded because they were later found to not meet inclusion criteria (eg conflicting illness to participate) and 16 withdrew consent, leaving 118 patients in the control group and 103 patients in the intervention group. For this analysis, 105 patients with COPD were included ($N = 57$ in control; $N = 48$ in intervention; see Figure 1).

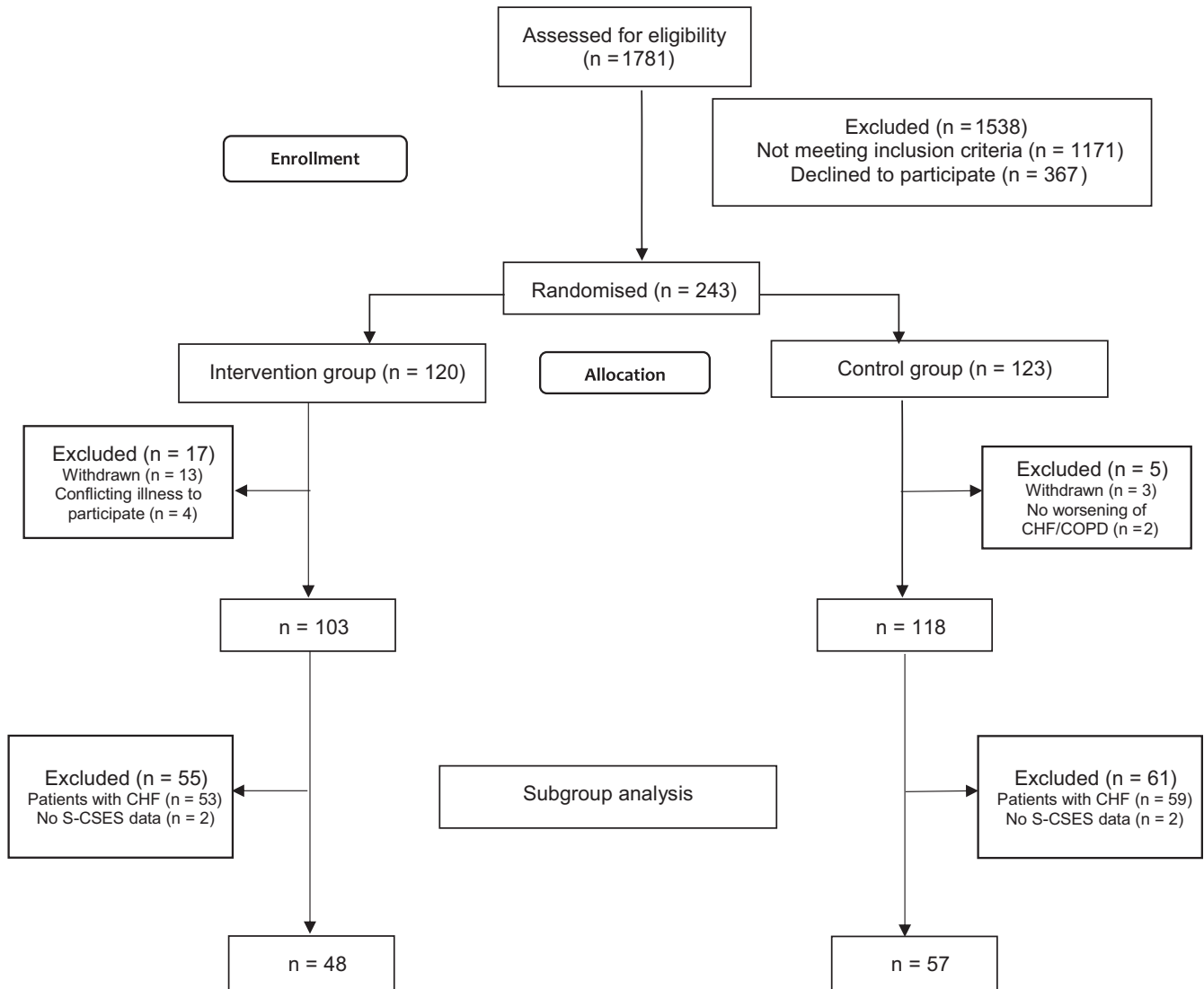


FIGURE 1 Trial profile

2.4 | Control group

Participants in the control group were managed as outlined in current treatment guidelines at study start (McMurray et al., 2012; Vestbo et al., 2013).

2.5 | Intervention group

In addition to usual care, the participants in the intervention group received a telephone call one to four weeks after discharge. The date and time for the call were agreed while the participants were still in the hospital and the call was made by one of four RNs. The RNs received extensive training in person-centred communication and met regularly, every other week, with a group of specialists in person-centeredness, communication and pedagogics. The aim of these meetings was to develop the RNs' skills in person-centred

communication (eg listening, asking open-ended questions and reflecting), documentation and understanding of the philosophical underpinnings of PCC and translating those skills to use in telephone-delivered PCC support. To further deepen the RNs' knowledge about PCC, the RNs reviewed some of each other's calls and documentation as an internal validation.

During the telephone interaction, the RNs strived to create a partnership with the patients (Ekman et al., 2011a, 2011b; Fors, et al., 2015a). Their starting point was to listen to the participants' narratives and ask questions to identify patients' resources and potential for self-care. The RNs investigated the participants' wishes, opportunities and problem areas such as how to take prescribed medicines. The participants and the RNs jointly formulated reachable goals, which were evaluated during the 6-month study period. After the calls, a brief summary of the conversation and agreed goals was documented in a health plan, which was sent via mail to the patients. The plan also included details about how and when the

TABLE 1 Baseline characteristics

	Control (N = 57)	Intervention (N = 48)	p-Value
Age, years (mean [SD])	74.7 (8.3)	75.2 (8.6)	.796
Female (%)	45 (78.9)	28 (58.3)	.033
BMI (mean [SD])	25.1 (5.2)	27.4 (8.9)	.151
Global Cardiac Self-Efficacy Score (mean [SD])	23.8 (8.8)	23.2 (10.2)	.730
Civil status (%)			
Living alone	32 (56.1)	30 (62.5)	.554
Married/partner	25 (43.9)	18 (37.5)	
Medical history (%)			
Previous MI	9 (15.8)	6 (12.5)	.781
Previous angina	8 (14.0)	6 (12.5)	1.000
Atrial fibrillation	11 (19.3)	9 (18.8)	1.000
Hypertension	26 (45.6)	26 (54.2)	.436
CABG	3 (5.3)	3 (6.3)	1.000
Stroke	4 (7.0)	6 (12.8)	.342
Diabetes	6 (10.5)	12 (25.0)	.069
Pacemaker	2 (3.5)	2 (4.2)	1.000
Current or previous smoker (%)	52 (91.2)	40 (85.1)	.369

Abbreviations: BMI, body mass index; CABG = coronary artery bypass grafting; MI, myocardial infarction.

patient and the RN would have further contact during the remaining study period, but patients in the intervention group were also able to contact the RNs between office hours during weekdays. In the following telephone conversations between patients and RNs, the health plan was reviewed and revised if necessary.

TABLE 2 Between-group comparisons of the Swedish Cardiac Self-Efficacy Scale (S-CSES). Changes in dimension scores at 3- and 6-month follow-ups

S-CSES	Usual care group N = 57			PCC group N = 48		
	Baseline*	Δ baseline to 3 months	Δ baseline to 6 months	Baseline*	Δ baseline to 3 months	Δ baseline to 6 months
Control symptoms dimension; mean (SD)	9.0 (4.1) (N = 56)	-0.35 (3.7) (N = 56)	-0.35 (4.5) (N = 56)	8.1 (4.2) (N = 46)	0.67 (3.5) (N = 46)	1.41 (3.2) (N = 46)
Control illness dimension; mean (SD)	8.9 (2.4) (N = 46)	-0.59 (1.8) (N = 46)	-0.38 (2.5) (N = 46)	6.7 (3.0) (N = 36)	0.75 (2.6) (N = 36)	0.94 (2.5) (N = 36)
Maintain function dimension; mean (SD)	7.0 (4.1) (N = 57)	-0.52 (4.1) (N = 57)	-0.64 (4.3) (N = 57)	8.4 (4.9) (N = 46)	-0.66 (4.0) (N = 46)	-0.70 (4.3) (N = 46)
Global cardiac self-efficacy dimension; mean (SD)	23.8 (8.8) (N = 57)	-1.12 (7.8) (N = 57)	-1.03 (8.9) (N = 57)	23.2 (10.2) (N = 46)	0.68 (7.7) (N = 46)	1.71 (8.6) (N = 46)

*Adjusted p-value for statistically significant between-group differences in demographic baseline characteristics (sex).

2.6 | Data collection

The original CSES contains 13 items, which are divided into two dimensions assessing patients' ability to manage their symptoms and maintain functioning (Sullivan et al., 1998). In the S-CSES, one item was removed because it did not conform with the model and the remaining 12 items showed excellent reliability (Cronbach's $\alpha = 0.89$) (Fors et al., 2015b). This validation also resulted in adding a third dimension (control illness). The 12 items are divided into three dimensions assessing patients' confidence in their ability to control their symptoms and their illness and to maintain functioning and may also be used as a total summary score representing a global cardiac self-efficacy dimension (Fors et al., 2015b). All items are rated on a 5-point Likert scale (0 = not at all, 1 = somewhat confident, 2 = moderately confident, 3 = very confident and 4 = completely confident). The ratings in the S-CSES are summed into scores on three dimensions: control symptoms (4 items), control illness (3 items) and maintain functions (5 items), with higher scores indicating better self-efficacy. The S-CSES was distributed to the participants while they were admitted to hospital (baseline) and the follow-up questionnaire was sent to participants' homes 3 and 6 months after discharge from hospital. Data on medical history were collected from the patients' electronic medical records, and data on baseline characteristics were collected from the patients on their inclusion in the study.

2.7 | Statistical analysis

Descriptive statistics were used to characterize the study groups. The categorical variables were analysed using Pearson's *chi-square* and Fisher's exact test and described with frequencies and percentages. Between-group differences were tested using a *t* test with a 95% confidence interval, and half-scale principles were

applied. A linear regression model was used to adjust for baseline differences in sex. Standardized response means (SRMs) were analysed to estimate magnitudes of between-group changes in S-CSES scores. The SRM was calculated as the difference between the mean change scores divided by the pooled SD change in both groups. The SRM magnitudes were interpreted in accordance with the criteria set by Cohen: trivial ($0 < 0.2$), small ($0.2 < 0.5$), moderate ($0.5 < 0.8$) and large (≥ 0.8) (Cohen, 1969). Small SRMs correspond to minimum clinically important differences (Cohen, 1969). Baseline and last observation carried forward were used to handle missing S-CSES data (28.6% at 3 months and 27.6% at 6 months). All statistical tests were two-sided with a significance level of $p \leq .05$. Data were analysed using SPSS version 25 ("IBM Corp. Released, 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.," 2017).

3 | RESULTS

In total, 105 persons with COPD were included, 57 in the control group and 48 in the intervention group. The mean age was 74.9 years. There were significantly more men in the intervention group than in the control group. There were no statistically significant between-group differences in medical history (Table 1).

At 3- and 6-month follow-ups, the PCC intervention group had improved significantly more than the control group in the illness control dimension ($\Delta = 0.75$, $SD 2.6$ versus $\Delta = -0.59$, $SD 1.8$; $p = .008$ and $\Delta = 0.94$, $SD 2.5$ versus $\Delta = -0.38$, $SD 2.5$; $p = .018$, respectively). This effect was corroborated in adjusted analyses ($p = .012$ and $p = .032$, respectively; Table 2). Estimates of effect size using SRMs for both 3- and 6-month follow-ups were moderate ($SRM = 0.61$; 95% CI = 0.16 to 1.05 and $SRM = 0.53$; 95% CI = 0.08–0.97, respectively).

The intervention group also improved significantly in the control symptoms dimension after 6 months ($p = .028$), but this effect was not confirmed in the adjusted model ($p = .053$) (Table 2). The SRM was small ($SRM = 0.44$; 95% CI = 0.0 to 0.83). There were no statistically significant differences between the groups in the maintain function dimension or in the global cardiac self-efficacy dimension (Table 2).

4 | DISCUSSION

We found that confidence in controlling illness, measured by CSES, in patients who were hospitalized due to worsening COPD improved significantly more in those who had received PCC via telephone, at both 3- and 6-month follow-ups, than in those receiving usual care alone. The absolute mean difference on a 9-point scale in the control illness dimension was 1.34 at 3 months and 1.32 at 6 months, which is considered moderate and corresponds to a minimum clinically important difference (Cohen, 1969). These results show that RNs have a central role in providing support to patients with COPD, which may have important implications for patient recovery after hospitalization for worsening COPD.

Previous studies have found that lower self-efficacy correlates with lower self-reported physical functioning in patients with COPD (Arnold et al., 2005), predicts hospitalization and all-cause mortality in patients with chronic heart failure (Sarkar et al., 2009) and predicts physical, social and family function in patients with coronary artery disease (Sullivan et al., 1998). Moreover, higher CSES has been associated with improved health-related quality of life in patients with chronic heart failure (Suresh et al., 2018), while lower CSES increases the odds of poor health status with greater symptom burden, more physical limitation and diminished quality of life in patients with coronary heart disease (Sarkar et al., 2007). In addition,

<u>p-value</u>	<u>Adjusted p-value*</u>	<u>p-value</u>	<u>Adjusted p-value*</u>
Difference between groups (baseline to 3 months)	Difference between groups (baseline to 3 months)	Difference between groups (baseline to 6 months)	Difference between groups (baseline to 6 months)
.162	.222	.028	.053
.008	.012	.018	.032
.865	.801	.948	.788
.244	.280	.118	.198

previous research has found that lower CSES is connected with living alone, lacking social support and psychosocial distress (Lauck et al., 2009). Patients with COPD constitute an especially vulnerable group because of their severe symptoms, multiple co-morbidities and lower socio-economic status than the general population (Grigsby et al., 2016; Yildirim et al., 2013). PCC has been shown to increase self-efficacy in patients with lower education, who are usually considered hard to reach (Fors et al., 2016).

Previously reported results from this RCT, evaluating the effects of a PCC intervention via telephone, showed that more patients in the control group than in the PCC intervention group deteriorated in general self-efficacy (Fors et al., 2018). The outcomes from the present study add that the interventions also were effective for patients with COPD to improve their task-specific self-efficacy in how to self-manage their illness. This is in contrast to Bringsvor and co-workers (Bringsvor et al., 2018), who found no such difference after a COPD self-management intervention. The content of interventions (PCC vs. self-management only) might therefore be a key factor in designing self-management interventions. In PCC, the focus is on listening and collaborating with patients rather than only instructing and teaching them about their disease.

COPD is well known to be connected with stigma (Ali et al., 2017; Berger et al., 2011), which makes this group difficult to reach with traditional health interventions. Partly because of the stigma, patients tend to be isolated and therefore appreciate being able to interact and communicate at distance such as by telephone (Ali et al., 2017; Strang et al., 2013). For many years, disease management programmes and nurse-led heart failure clinics have been available to patients who have been hospitalized for chronic heart failure. However, follow-up care for patients with COPD has not been organized or structured in the same way. These patients also report lack of support from healthcare professionals especially on discharge from the hospital, when they struggle with severe anxiety and worries on their return to daily life (Ali et al., 2017; Strang et al., 2013). In this follow-up, RNs using PCC can play a vital role in supporting patients with symptom relief and management of their illness (Wallstrom & Ekman, 2018).

Support at a distance has been shown to be a potentially successful way for RNs to reach out to patients who usually handle their illness on their own (Gammon et al., 2015). Telephone support interventions may also help to reduce anxiety and depression (Bisschop et al., 2004) and to improve self-rated health (Bambauer et al., 2005). The Internet can also be used to provide support at a distance, but more personal contact is preferred (Elf et al., 2011), which highlights the RNs' role in such interventions. Our study relied on the expertise of the RNs to create partnerships with participants, who they had never met face to face, but still managed to support using their person-centred ethics and PCC communication skills (Ali et al., 2013, 2017; Elf et al., 2011). The core of person-centred ethics is to elicit patients' personal resources and capabilities to support them in strengthening their confidence in handling their illness on their own. This may explain the findings in our study, which extend

the results of previous studies showing that PCC can strengthen self-efficacy in patients with acute coronary syndrome (Fors et al., 2016a, 2016b, 2015b).

Although this type of healthcare support might be considered time-consuming, the telephone support in the main study was only used for 81.6 min per patient during the six-month study period (Fors et al., 2018). Moreover, several studies have shown that providing support through distance is time-efficient and therefore has the potential to be cost-effective (Goldzweig et al., 2009; Rollo et al., 2018).

4.1 | Study limitations

Methodological considerations for the main study have been previously described (Fors et al., 2018), but this study has some further limitations that should be considered. First, the study sample was relatively small, which may lead to underestimation of the differences. Second, there were between-group gender differences in baseline characteristics. However, when the CSES was developed cardiac self-efficacy levels were not found to be gender-related (Sullivan et al., 1998). Third, other potential confounding variables than the ones collected at baseline, such as stage of COPD, which was not regularly documented in the medical records may have affected the result. Finally, the original CSES was not designed for patients with COPD. However, it has been used in patients with COPD (Arnold et al., 2005) and about half of the included patients in the present study had hypertension and other cardiac-related conditions and most of the items in the questionnaire concern living with illness in general and are not focused on a specific disease.

The questionnaire has been validated in Swedish (Fors et al., 2015b) and used in previous research (Fors et al., 2016a), which allows comparisons with other studies and conditions. Moreover, the proportion of missing data was low at all assessments. The measured data were self-reported by the participants, which minimizes bias and increases the likelihood that the results closely reflect the participants' actual experience.

5 | CONCLUSION

PCC via telephone, provided by RNs, for patients with a severe chronic disease as COPD may increase patients' confidence in their ability to manage their illness. This approach may be a feasible strategy to support patients in their rehabilitation outside the healthcare facilities.

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CONFLICT OF INTEREST

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The authors have no conflict of interest to declare.

AUTHOR CONTRIBUTIONS

All authors were involved in the design of the study. LA drafted the manuscript with critical input from SW, IE, KS and AF. LA, SW and AF performed the analysis. IE is the grant holder and project leader. All authors refined the manuscript and approved the final version.

ETHICAL APPROVAL

The study conforms with the CONSORT guidelines for non-pharmacological treatment (Boutron et al., 2007; Moher et al., 2001). All participants gave written informed consent to participate. The procedures conformed with the principles outlined in the Declaration of Helsinki (World Medical Association, 2004) and were approved by the Regional Ethical Review Board.

CONSENT FOR PUBLICATION

As we do not provide personal information in our manuscript, "Consent for publication" is not applicable here.

DATA AVAILABILITY STATEMENT

All relevant data supporting the results are included in the paper.

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