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The Impact of Singing Therapy on the Quality of Life of Chronic Obstructive Pulmonary Disease Patients: A Systematic Review

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ABSTRACT

Purpose: The purpose of this study is to identify the intervention effect on health-related quality of life (HRQoL) of applying singing therapy to Chronic Obstructive Pulmonary Disease (COPD) patients through a systematic review. Method: PubMed, Cochrane, CINAHL, Research Information Sharing Service(RISS), DBpia, and Koreanstudies information service system(KISS) were searched for eligible articles that matched a pre-defined criteria from 2009 to 2023. Four randomized controlled trials (RCTs) were selected for final analysis. The risk of bias assessment was conducted using the assessment criteria adopted from the Cochrane Library. Result: All selected studies used singing therapy as the intervention for treating COPD, but the details of the study such as the time, duration, and frequency varied amongst studies. Also, there was no statistical difference between the intervention and control group on the quality of life. However, in the intervention group, there was a significant difference in the results between pre-intervention and post-intervention. Conclusion: The results from this systematic review implies that singing therapy significantly improves the quality of life in COPD patients.

Keywords: Pulmonary Disease, Chronic Obstructive, Singing, Quality of Life, Systematic review.

INTRODUCTION

Need for the Study

Chronic Obstructive Pulmonary Disease (COPD) is considered one of the most severe respiratory conditions and has been identified as the third leading cause of death worldwide according to the World Health Organization [1]. In South Korea, although the number of patients receiving clinical care for COPD has decreased by 10.7% over the past five years, the trend differs by age group. While cases have declined among individuals under 70 years of age, no meaningful change has been observed among those aged 70 and older, and the number of patients aged 80 and above continues to increase steadily. Furthermore, both the annual per-capita medical cost and the average length of hospital stay for COPD have consistently risen over the past five years [2]. Notably, the proportion of individuals who visited the emergency department due to COPD in South Korea has continued to increase over the same period, as of 2019 [3].

COPD is characterized by dyspnea, shortness of breath, coughing, and sputum production due to airway and lung impairments, and symptoms may worsen due to air pollution and smoking [4]. Because COPD is a progressive and irreversible disease, patients not only experience a wide range of physical symptoms but also various psychological symptoms. Depression and anxiety

among COPD patients negatively affect physical functioning and social interactions, leading to fatigue and inefficient healthcare utilization [5].

The goals of COPD management are to relieve symptoms, improve quality of life, prevent disease progression, reduce acute exacerbations, and decrease mortality [6]. COPD treatment is largely categorized into risk-factor reduction, pharmacological therapy, and pulmonary rehabilitation [4]. Pulmonary rehabilitation consists of education on disease understanding and treatment, medication guidance, breathing techniques, upper and lower extremity exercises, and emotional support. Such programs help reduce dyspnea and fatigue, enhance emotional functioning, improve the sense of control, and ultimately increase patients' quality of life and exercise capacity [7].

A review of current COPD management practices in Korean healthcare settings shows that treatment primarily relies on pharmacological therapy. The proportion of patients prescribed inhaled bronchodilators, the main therapeutic agents, increased from 67.9% in 2015 to 80.7% in 2019 [3]. However, pulmonary rehabilitation remains underutilized compared to other countries. According to a 2013 national survey, only 9 out of 43 hospitals (20.9%) in Korea offered pulmonary rehabilitation programs, while 32 hospitals (74.4%) did not provide such services. Outpatient pulmonary rehabilitation, which is widely used abroad, requires frequent hospital visits, posing a challenge for patients with limited mobility. In Korea, additional barriers include limited insurance coverage, insufficient space, and inadequate staffing in hospitals. Therefore, to promote pulmonary rehabilitation domestically, it is necessary to introduce feasible home-based rehabilitation strategies that patients can perform independently. Yet home-based pulmonary rehabilitation remains limited in Korea, and effective methods and detailed guidelines have not been clearly established [8].

Various pulmonary rehabilitation techniques have been proposed, including exercise therapy such as walking and cycling, as well as alternative approaches such as playing musical instruments and singing [7,8]. COPD patients often experience dyspnea due to impaired airflow during exhalation. Singing requires the use of respiratory muscles to regulate inhalation and exhalation, which may help support and control breathing. This process can strengthen respiratory muscles and stabilize breathing through regular respiratory control. Additionally, engaging in enjoyable activities such as singing may promote psychological stability and positive emotional experiences [9]. Previous studies have reported that singing not only positively influences respiratory function but also improves depression and quality of life. Based on this evidence, the present study aims to examine the effects of a singing intervention on the quality of life among patients with COPD.

Purpose of the Study

This study is a systematic review aimed at evaluating the effects of singing interventions on the quality of life of patients with COPD by analyzing previous intervention studies that applied singing therapy and assessed quality-of-life outcomes. The specific objectives of this study are as follows:

- First, to identify the general characteristics of intervention studies that applied singing therapy to COPD patients and measured their quality of life.

- Second, to analyze and examine the application methods, frequency, duration, and other components of singing therapy used in COPD patients.
- Third, to analyze the effect size of singing interventions applied to patients with COPD.

METHODS

Study Design

This study is a systematic review conducted to analyze previous research that applied singing therapy to patients with COPD and to identify its effects on their quality of life.

Key Question

The literature search and study selection process were conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline [10]. The core question was structured using the Patient, Intervention, Comparator, Outcome, and Study Design (PICO-SD) framework, as shown in <Table 1>.

Table 1: PICO-SD

P (Participants)	Patients diagnosed with COPD
I (Intervention)	Singing therapy
C (Comparisons)	Control groups receiving other types of rehabilitation therapy or no intervention
O (Outcome)	Studies measuring quality of life as an outcome following the implementation of singing therapy
SD (Study Design)	Systematic review of randomized controlled trials (RCTs)

Inclusion and Exclusion Criteria

The inclusion criteria consisted of studies published between 2009 and 2023, both domestically and internationally, that met the PICO-SD framework. The exclusion criteria were as follows:

1. studies not written in Korean or English,
2. studies for which full-text articles were not available,
3. studies that were not randomized controlled trials (RCTs),
4. studies without a control group, and
5. pilot studies.

Search Strategy

This review analyzed randomized controlled trials published between 2009 and 2022 that applied singing therapy to COPD patients and measured quality-of-life outcomes. The international databases searched included PubMed, Cochrane, and CINAHL, while domestic databases included the Research Information Sharing Service (RISS), DBpia, and the Korean Studies Information Service System (KISS).

Search terms were developed using Boolean operators and truncation. For domestic databases, the keywords included “만성폐쇄성폐질환 (COPD)” OR “폐기종 (emphysema)” OR “만성기관지염 (chronic bronchitis)” AND “노래요법 (singing therapy)” OR “노래부르기요법 (singing intervention)” OR “재활치료 (rehabilitation therapy)” AND “삶의질 (quality of life).” For international databases, the search terms included “COPD” OR “emphysema” OR “chronic

bronchitis" AND "singing therapy" OR "singing class" OR "music therapy" OR "sing" AND "quality of life."

Study Selection Process

Across six databases, 67 articles were identified from CINAHL, 107 from Cochrane, and 73 from PubMed. Of the total 247 records, 35 duplicates were removed. Abstract screening resulted in the exclusion of 193 studies. Among the remaining 19 articles, none lacked full-text availability. After full-text review, 10 studies were excluded due to inappropriate study design, 3 due to inaccurate abstracts or protocols, 1 due to unrelated interventions, and 1 due to incompatible outcomes. Ultimately, 15 studies were excluded, and 4 studies were included in the final review. The selection process is presented in [Figure 1].

Risk-of-Bias Assessment

The risk of bias in the included studies was evaluated using the Cochrane Risk-of-Bias tool. Seven domains were assessed: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective outcome reporting, and other potential sources of bias. Each item was rated as having low, high, or unclear risk of bias.

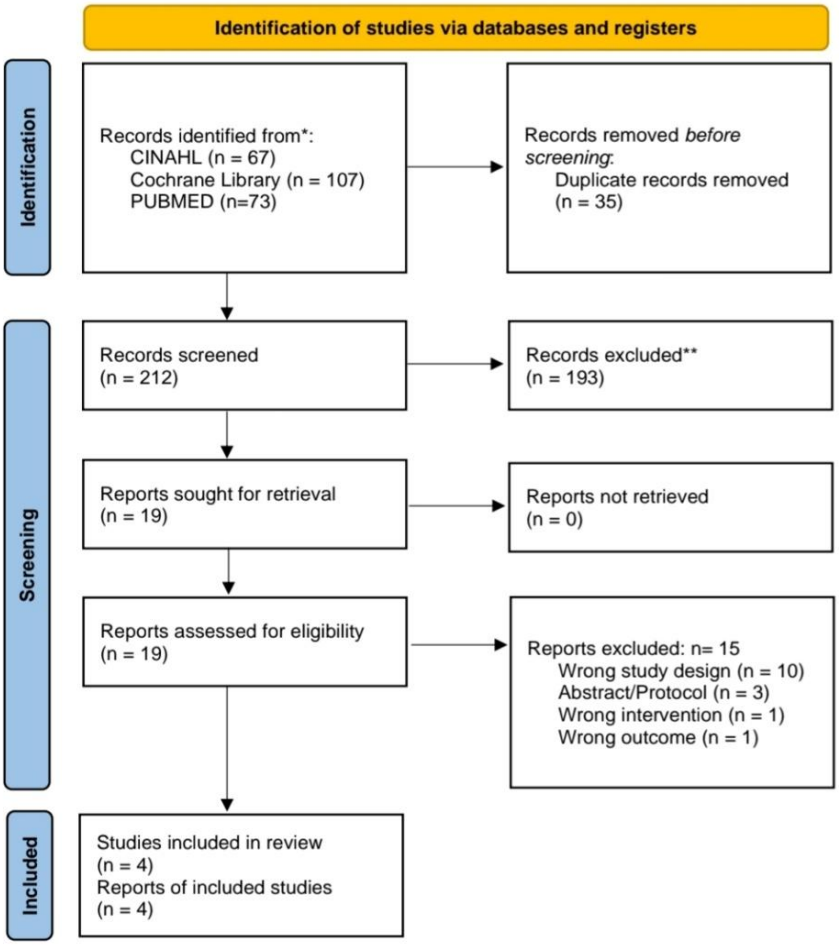

Figure 1: Flow chart of study selection process

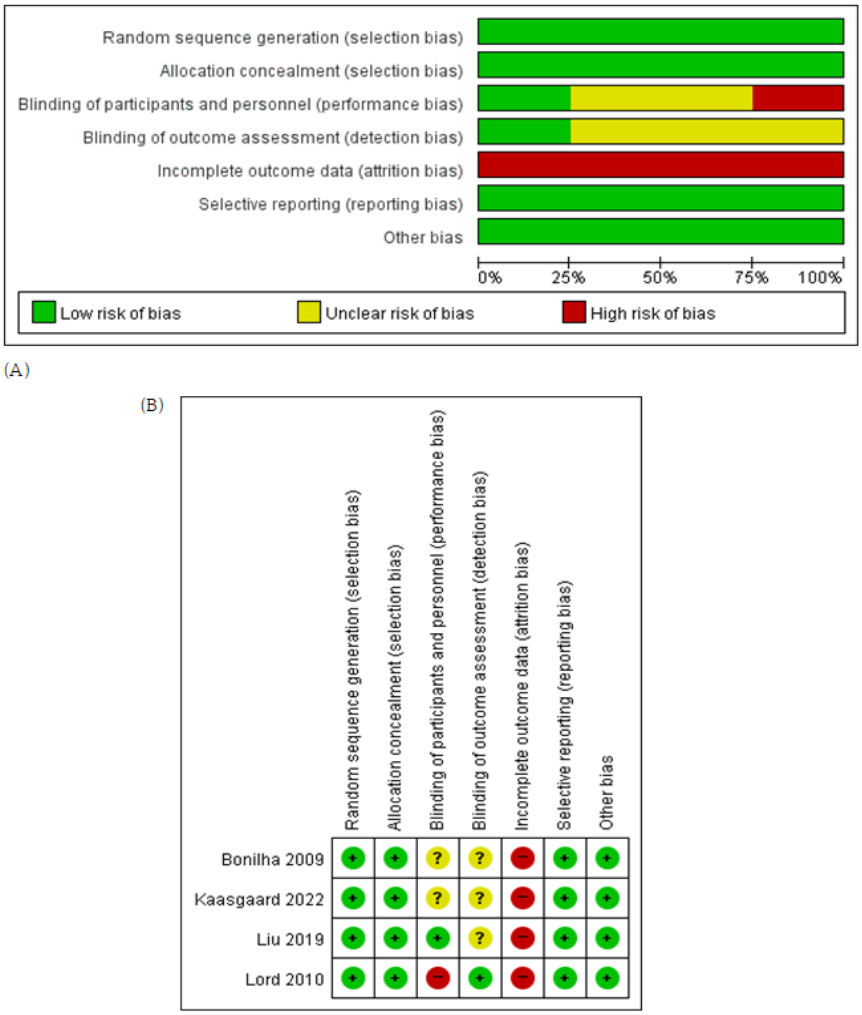

Figure 2: (A) Risk of bias graph and (B) risk of bias summary

RESULTS

General Characteristics of the Included Studies

A total of 384 participants were included across the selected studies. The included articles were published in 2009 (one study), 2010 (one study), 2019 (one study), and 2022 (one study). All participants were diagnosed with COPD based on the Global Initiative for Chronic Obstructive Lung Disease (GOLD) criteria, and every study employed a randomized controlled trial (RCT) design.

Risk-of-Bias Assessment

The risk of bias for the included studies was assessed using the Cochrane Risk-of-Bias tool. The findings are presented in [Figure 2]. For selection bias, all four studies demonstrated low risk, as both random sequence generation and allocation concealment were adequately reported.

Regarding performance bias, only one study [11] implemented single blinding and was therefore evaluated as low risk. Two studies[12,13] did not provide sufficient information, resulting in unclear risk. One study [14] was rated as high risk because the intervention was applied only to the experimental group, with no equivalent control treatment.

For detection bias, only one study [14] was rated as low risk, as outcome assessors were blinded to the intervention group and unaware of whether they were evaluating participants in the experimental or control group during pre- and post-tests. The remaining studies did not report information regarding assessor blinding, leading to unclear risk.

Attrition bias was assessed as high risk in all studies because attrition rates exceeded 5%. For reporting bias, all four studies were evaluated as low risk, as outcome data were reported for all remaining participants after attrition.

Intervention Characteristics

All included studies applied singing therapy as the intervention. Intervention characteristics were examined in terms of intervention content, duration, frequency, length, and the type of control intervention (<Table 1>).

Regarding intervention content, three studies implemented preparatory activities such as relaxation or warm-up exercises, followed by vocalization exercises and singing [11-13]. One of these studies incorporated a cool-down phase at the end of each session [13]. Another study provided education on breathing techniques, breath management, vocal exercises, and singing practice, but detailed procedural information was not fully described [14].

Intervention content, duration, frequency, and total length varied across studies. Session duration was 60 minutes in three studies [11, 12, 14] and 90 minutes in one study [13]. Two studies implemented singing therapy once per week [11, 12], while the other two implemented it twice per week [13, 14]. Intervention duration ranged from 24 weeks in two studies [12,14], 10 weeks in one study [13], and 6 weeks in one study [11].

Control-group interventions varied across the four studies. One study provided handicraft activities [12]. Another provided all components of the intervention except the vocalization and singing elements [13]. One study delivered standard health education [11]. The remaining study provided breathing control and dyspnea management training but excluded vocal and singing practices [14].

Outcome Measures

Three studies assessed quality of life using the Saint George's Respiratory Questionnaire (SGRQ) [12-14]. One study used the Clinical COPD Questionnaire (CCQ) [11].

Intervention Outcomes

In all four studies, pre- and post-intervention measurements were conducted, with one study assessing outcomes at 1, 3, and 6 months post-intervention [11]. Among the three studies that used the SGRQ, one study found improvements in quality of life in both the singing intervention group and the handicraft control group. Although no statistically significant differences were observed between the groups, within-group analysis revealed significant improvements [12].

Another study reported that both the control group, which received only breathing management, and the experimental group, which received breathing management combined with singing, showed improvements in quality of life, with no significant differences between the groups [14].

In another study, no significant differences were found between the physical-activity intervention group and the singing intervention group. However, within specific SGRQ subdomains—particularly those assessing social function and psychological impairment—singing therapy demonstrated beneficial effects [13].

In the study using the CCQ, outcomes were assessed at 1, 3, and 6 months. No significant group differences were found at 1 month. However, significant differences emerged at both 3 and 6 months, with the singing-therapy group demonstrating improved quality of life compared to the control group [11].

Table 2: Characteristics of analyzed studies

Study	Research design	Intervention		Minutes, Frequency, Duration	Sample size		Outcome
		Experimental group	Control group		Experimental group	Control group	
Bonilha et al. (2009)	RCT	a. Relaxation exercises (5min) b. Singing related respiratory exercises (10min) c. Vocalization exercise (15min) d. Singing training (30min)	a. Handcraft work relaxation exercises (5min) b. handcraft artwork (50min)	60min, 1time/ 24wks	15	15	Saint George's Respiratory Questionnaire
Kaasgaard et al. (2022)	RCT	a. physical warm-ups(20min) b. physical exercise & vocal warm-up (20min) c. Singing (40min) d. cooling cown (10min)	a. physical warm-ups (20min) b. physical exercise (60min) c. cooling down (10min)	90min 2times/ 10wks	145	125	Saint George's Respiratory Questionnaire
Liu et al. (2019)	RCT	a. Relaxation exercises (5min). b. Respiratory exercises (10min) c. Vocalization exercises (15min) d. Singing exercises (30min)	routine health education	60min, 1time/ 24wks	28	28	Clinical COPD Questionnaire
Lord et al. (2010)	RCT	a. breathing control and techniques to manage breath-lessness b. posture relaxation and vocal exercises.	breathing control and techniques to manage breath-lessness	60min 2times/ 6wks	15	13	Saint George's Respiratory Questionnaire

DISCUSSION

COPD is a chronic, irreversible condition in which physical limitations caused by dyspnea can lead to anxiety, social isolation, and subsequently depressive symptoms. Therefore, this study sought to suggest effective intervention strategies to improve the quality of life of COPD

patients by analyzing and synthesizing experimental studies that examined the effects of singing therapy.

The frequency of interventions varied across studies, ranging from one to two sessions per week, with each session lasting approximately 60 to 90 minutes. Intervention periods ranged from a minimum of 6 weeks to a maximum of 24 weeks, representing a total of 12 to 24 intervention sessions. Because the specific content of singing therapy differed across studies, direct comparison was challenging. Thus, future research should identify the most effective duration, frequency, length, and components of singing interventions.

All included studies used singing therapy as the intervention, and quality of life served as the primary outcome measure. Although improvements in quality of life were observed in all four studies, three used the SGRQ and one used the CCQ. This inconsistency suggests a need for standardized measurement instruments in future research.

While this review confirmed the potential usefulness of singing therapy in enhancing the quality of life of COPD patients, it did not provide a unified protocol for its application. Therefore, further research is needed to determine the optimal session length, frequency, and duration for efficient implementation. Additionally, because singing is an intervention with cultural elements and no domestic studies have yet been conducted in Korea, future studies should examine whether such interventions are applicable and culturally appropriate for Korean patients.

If standardized educational content for singing therapy is developed for COPD patients in Korea, this intervention may potentially be applied in clinical settings as an additional reimbursable service or delivered in community-based group classes.

CONCLUSION AND SUGGESTIONS

Conclusion

This study is a systematic review analyzing the effects of singing therapy on improving the quality of life of patients with COPD, based on studies published domestically and internationally from 2009 to 2023. Four international studies were included in the final review. Quality appraisal was conducted for all selected studies, and the findings are as follows. First, the characteristics of the included studies were categorized and analyzed according to intervention content, duration, frequency, intervention period, and type of control intervention. Second, all four studies were randomized controlled trials, and their risk of bias was assessed using the Cochrane Risk-of-Bias tool. The results indicated low risk for selection bias and reporting bias, high risk for attrition bias, and generally unclear risk for the remaining domains. Third, analysis of intervention characteristics revealed that all studies employed group-based singing interventions. Session duration was most commonly 60 minutes, with frequencies ranging from once to twice per week and intervention periods ranging from 6 to 24 weeks. Both the specific implementation of singing therapy in the experimental groups and the comparison interventions in the control groups differed considerably across studies. Fourth, two quality-of-life measurement tools—SGRQ and CCQ—were used across the studies. While no significant differences were observed between experimental and control groups, most studies reported significant improvements within the experimental group from pre- to post-intervention.

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Suggestions

Based on the findings of this review, the following recommendations are proposed for future research:

- First, because there is no established standard regarding the optimal frequency, duration, intervention period, or content of singing therapy, future studies should aim to identify ideal parameters that most effectively enhance quality of life.
- Second, given that singing is a culturally embedded intervention and no studies have been conducted in Korea, research is needed to examine its applicability among Korean COPD patients. If feasible, further intervention studies should be undertaken using culturally appropriate approaches.

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