Effect of Breathing Exercises on Fatigue, Dyspnea, and Functional Classification in Heart Failure Patients: A Three-Arm Randomized Controlled Trial

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ABSTRACT

Introduction: Heart failure (HF) is the most common cardiovascular reason for hospitalization of patients over 60 years old. Fatigue and dyspnea are the main symptoms of HF and cause deterioration of patients' daily function and self-care. This study aimed to determine the effectiveness of breathing exercises using two methods on fatigue severity, dyspnea, and the New York Heart Association (NYHA) functional classification in these patients.

Methods and Materials: This three-arm clinical trial was conducted on 90 adult HF patients. Participants were randomly assigned to three groups (30 participants in each group), including diaphragmatic and pursed-lip breathing (DG), flow-oriented incentive spirometry (SG), and a control group (CG). The interventions were performed three times daily for 10 days in DG and SG. While participating in this study, none of the patients were deprived of continuing the treatment and care procedures prescribed by the medical staff. Before and after the intervention, data were collected using the Fatigue Severity Scale (FSS), modified Borg dyspnea scale (at rest and during activity), and NYHA functional classification. The data analysis of the study was perfumed using SPSS-20 software.

Results: There was no significant difference between the three groups regarding baseline characteristics. Fatigue severity in the two intervention groups significantly decreased ($p = 0.001$). The frequency of patients with severe fatigue decreased by 30% in both DG and SG. The mean dyspnea score in DG and SG decreased by 0.7 and 0.9 units at rest ($p = 0.001$) and decreased by 2.93 and 2.73 units during activity ($p = 0.001$). Regarding NYHA functional classification, the frequency of patients in classes III and IV was significantly decreased by 30% in DG and 33.3% in SG ($p = 0.001$). However, after the intervention, there was no significant difference between DG and SG regarding improvement and reduction in fatigue severity, dyspnea, and NYHA functional classification. None of these items were statistically different in CG before or after the intervention.

Conclusion and Discussion: The present study show that breathing exercises using two methods, diaphragmatic and pursed-lip breathing exercises, and flow-oriented incentive spirometry, reduce fatigue and dyspnea and improve NYHA functional classification of patients with HF. Also, breathing exercises should be included in the nursing care program for HF patients as a simple, low-cost, and uncomplicated intervention.

Keywords: Breathing exercises, Heart failure, Randomized controlled trial