



KEY WORDS

- ✓ aerobic exercise
- ✓ FEV₁/FVC ratio
- ✓ local muscle exercise
- ✓ Soleus Push-Up
- ✓ spirometer

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INVESTIGATION OF THE ACUTE AND CHRONIC EFFECTS OF LOCAL LOWER EXTREMITY MUSCLE EXERCISE ON RESPIRATORY FUNCTIONS USING SPIROMETRIC METHODS

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THESIS ABSTRACT

This study investigated the acute and chronic effects of Soleus Push-Up (SPU), aerobic exercise (AE), and their combination on respiratory functions in sedentary individuals. Forty healthy volunteers (18–45 years) were randomly assigned to SPU, AE, AE+SPU, or control groups. Exercise protocols were applied three times per week for four weeks, and spirometric parameters (FVC, FEV₁, FEV₁/FVC, MVV, etc.) were measured at baseline, week 2, and week 4. Findings showed short-term improvements in airflow rates (PEF, FEF_{25–75}), while no significant changes occurred in volume parameters (FVC, IC, MVV). A significant increase in FEV₁/FVC was observed only in the AE group. SPU and AE enhanced expiratory flow rates, but no synergistic effect was found in the combination group. These results suggest that short-term exercise may improve airflow rates in sedentary individuals, whereas longer-term programs may be necessary for volumetric gains.

APPLICATION AREAS OF THE THESIS RESULTS

These thesis results indicate that low-intensity Soleus Push-Up and aerobic exercises can be incorporated into rehabilitation programs to improve respiratory functions in sedentary individuals. Due to their low cost and ease of implementation, these exercises may be utilized in clinical rehabilitation, home-based exercise programs, and community-based respiratory health projects.

ACADEMIC ACTIVITIES

1. On May 9, 2025, at the 1st International Yıldırım Beyazıt Symposium on Scientific Research and Innovation, I delivered an oral presentation of our study entitled 'Menstrual Cycle Phases in Women and the Effects of Calisthenic Exercises Applied During These Phases on Hemostasis.'