

The exercise test was conducted before and after 10 weeks of exercise training. The test was terminated based on the following criteria: chest tightness or chest pain, exhaustion, reaching 90% maximal heart rate, abnormal EKG change, or stopping requested by the subject. The estimated VO_{2max} for each subject was calculated by the formula²²: $VO_{2max} = [\text{speed} \times 26.8 \times (0.1 + 1.8 \times \% \text{grade})] + 3.5$.

Exercise Training Regimen

The training program was designed as 3 sessions per week for 10 weeks. Each session consisted of a warm-up period, a 30-minute treadmill exercise, a cool-down, and 5 minutes of muscle strengthening activities. Exercise intensity was set between 40% and 80% of estimated VO_{2max} . Blood pressure was measured before exercise, 15 minutes after exercise had begun, and at the end of each exercise training session. Heart rate and rhythm were recorded before the beginning of exercise and every 5 minutes during the exercise period. When the patient finished exercising, heart rate and rhythm were continuously monitored until heart rate returned to the baseline level.

Exercise Self-efficacy

This was measured by the Exercise Self-efficacy Scale, which was used to measure a subject's judgment about his/her ability of treadmill performance. Scores for this scale vary from a minimum of 0 to a maximum of 100. A higher score on the scale indicates a higher confidence level during treadmill performance. Internal consistency of this scale was analyzed by a Cronbach's alpha coefficient of 0.88. Concurrent validity of the scale in the current study was supported by a significant correlation coefficient ($r = 0.73$, $p = 0.005$) between this scale and the estimated VO_{2max} .

Ability to Perform Common Activities

This was measured by the Duke Activity Status Index, a brief self-administered questionnaire developed by Hlatky et al.²³ The scale includes 12 items, and calculated scores are based on metabolic equivalent units (METs). Weighting of items in the index is based on the known metabolic costs of each activity in MET units.

The concurrent validity was supported by a significant positive relationship between scores on the Duke Activity Status Index and functional capacity.²⁴ Internal consistency of this scale in the current study was demonstrated by a Cronbach's alpha coefficient of 0.75.

Body Image

This was measured by the Body Cathexis Scale developed by Secor and Jourard.²⁵ The Body Cathexis Scale, a 5-point Likert with 46 items, has been widely used in measuring subjects' satisfaction about their body image. Subjects are asked to circle a number between 1 "very dissatisfied" and 5 "very satisfied." Higher scores indicate higher satisfaction with body image, while a score below 3 means dissatisfaction. The split-half reliability ($r = 0.81$) and 1-week test-retest reliability ($r = 0.67$) of the Body Cathexis Scale have been reported.²⁵ The internal consistency of the scale has been supported by a Cronbach's alpha coefficient of 0.91 for healthy and diseased children's mothers.²⁶ The concurrent validity also has been supported by previous studies.^{27,28} Internal consistency of this scale in the current study was demonstrated by a Cronbach's alpha coefficient of 0.93.

Physical Signs and Symptoms

These were determined by the Symptoms Distress Scale developed by Haunget et al.²⁹ This is a 4-point Likert scale with 45 items. Higher scores on the Symptoms Distress Scale indicate more severe physical symptoms. The internal reliability and content validity of this scale have been supported.²⁹ Internal consistency of this scale in the current study was demonstrated by a Cronbach's alpha coefficient of 0.93.

Data Collection

Subjects were referred by their physicians and were contacted and scheduled for a lung function test and graded exercise test. A thorough explanation of the study protocol was provided, and a consent form was signed on the orientation day. Exercise training began as soon as the graded exercise test was completed. All subjects had to fill out the Exercise Self-efficacy Scale, Duke Activity Status Index, Body Cathexis Scale, and Symptoms Distress Scale before and after 10 weeks of