

Effect of breathing training on heart rate variability, anxiety and quality of life in hemodialysis patients : A randomized control trial

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PURPOSE

To investigate the effect of respiration training on the improvement of heart rate variability (HRV), anxiety, and the quality of life in hemodialysis patients

METHOD

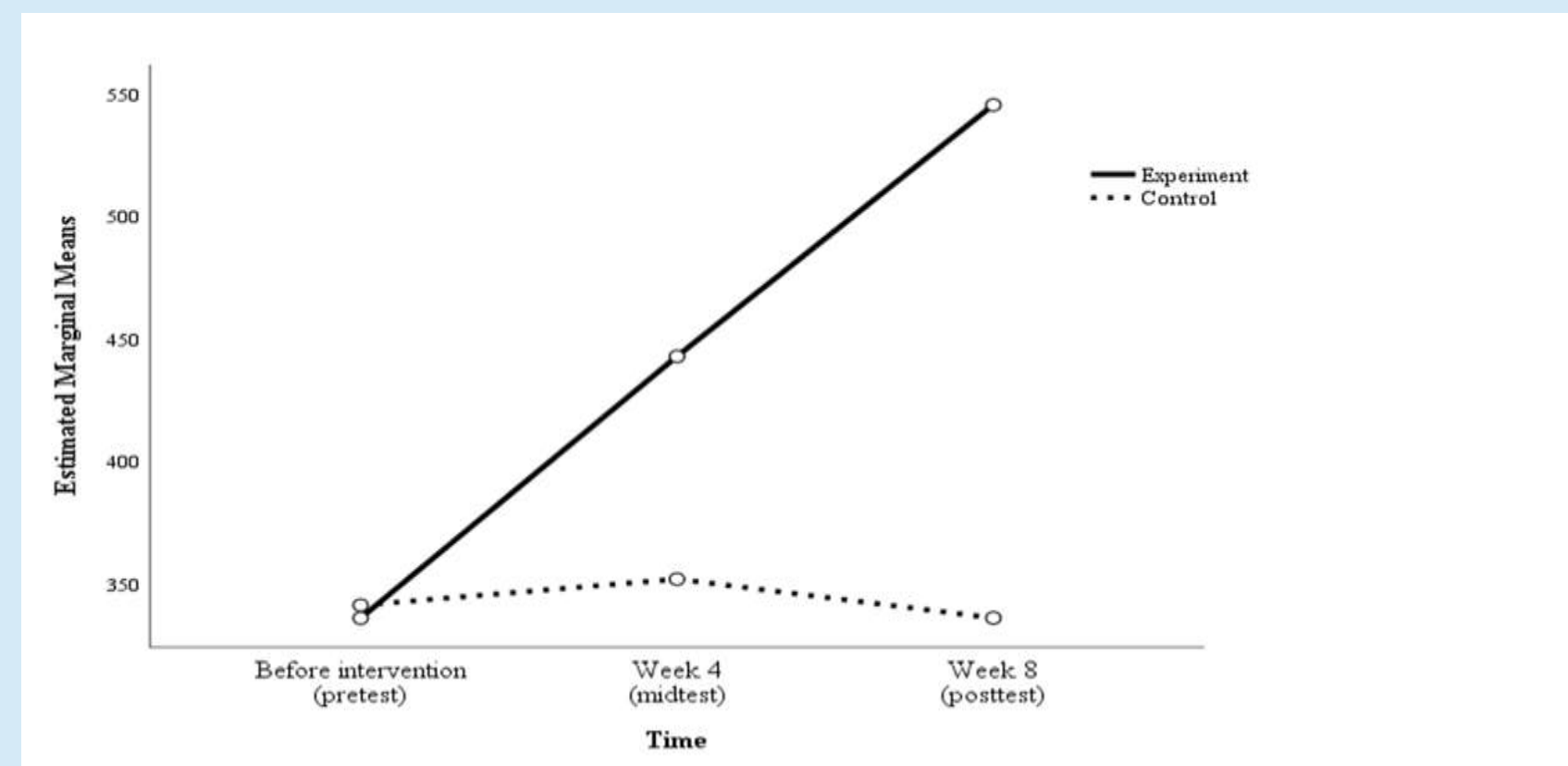
Our research adapted the cluster randomization test. The experimental group and the control group were randomly assigned by a coin toss. We conducted the study for eight weeks and investigated the effects of respiration training on the improvement of HRV, anxiety, and the quality of life in hemodialysis patients. The investigated cases were end-stage kidney patients with long-term hemodialysis treatment in a medical center in Taipei. A total of 119 valid samples were obtained. Both groups were monitored by HRV monitor, complicated the State-Trait Anxiety Inventory and WHOQOL- BREF as the pretests. Each patient would then receive the respiration training individually. The respiration training should be performed five times per hour during hemodialysis, three times a week for eight weeks.

The HRV was monitored every week in the experimental group; while in the experimental group, HRV was monitored in the fourth week and post-tested data was collected in the eighth week. Anxiety and quality of life were post-tested only at the eighth week.

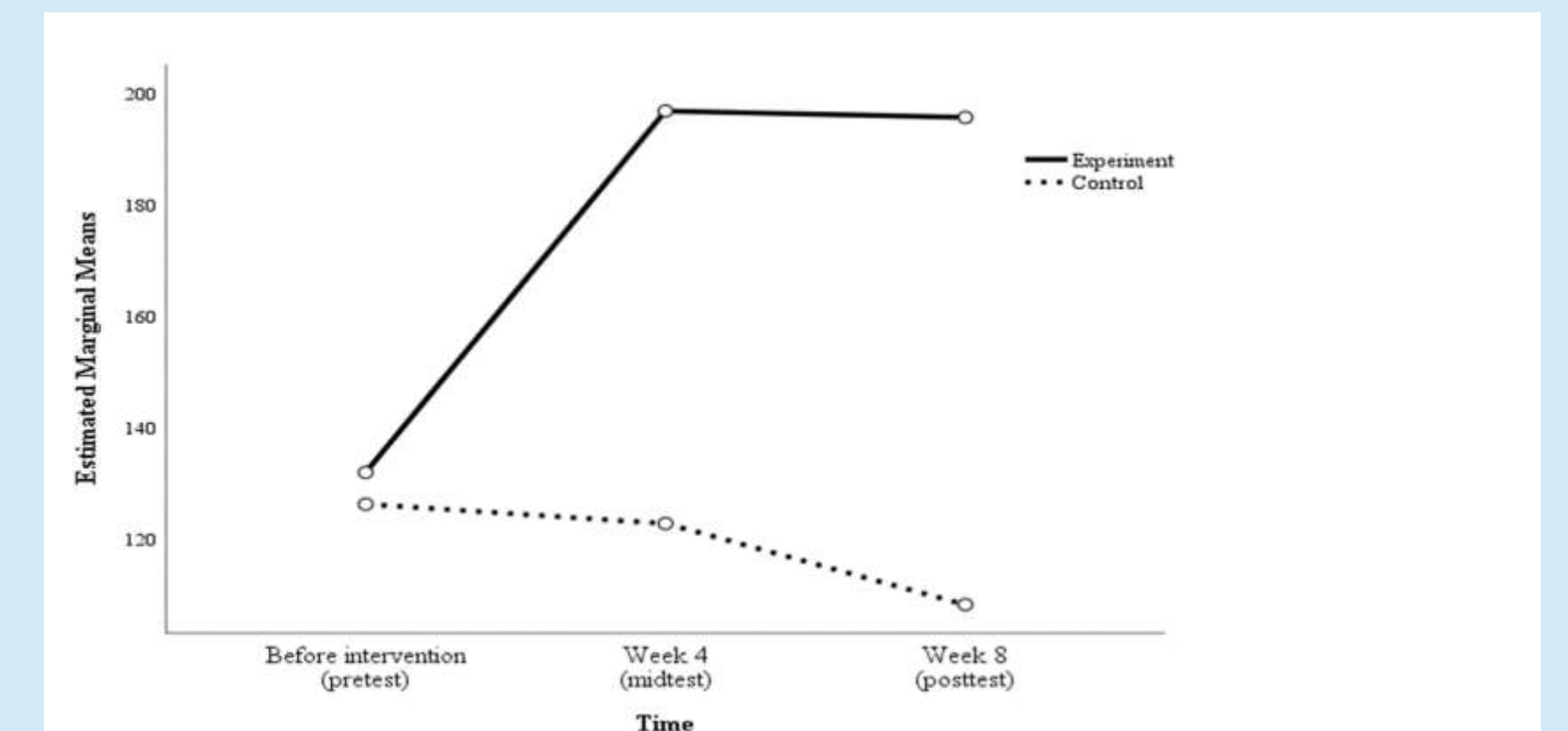


RESULTS

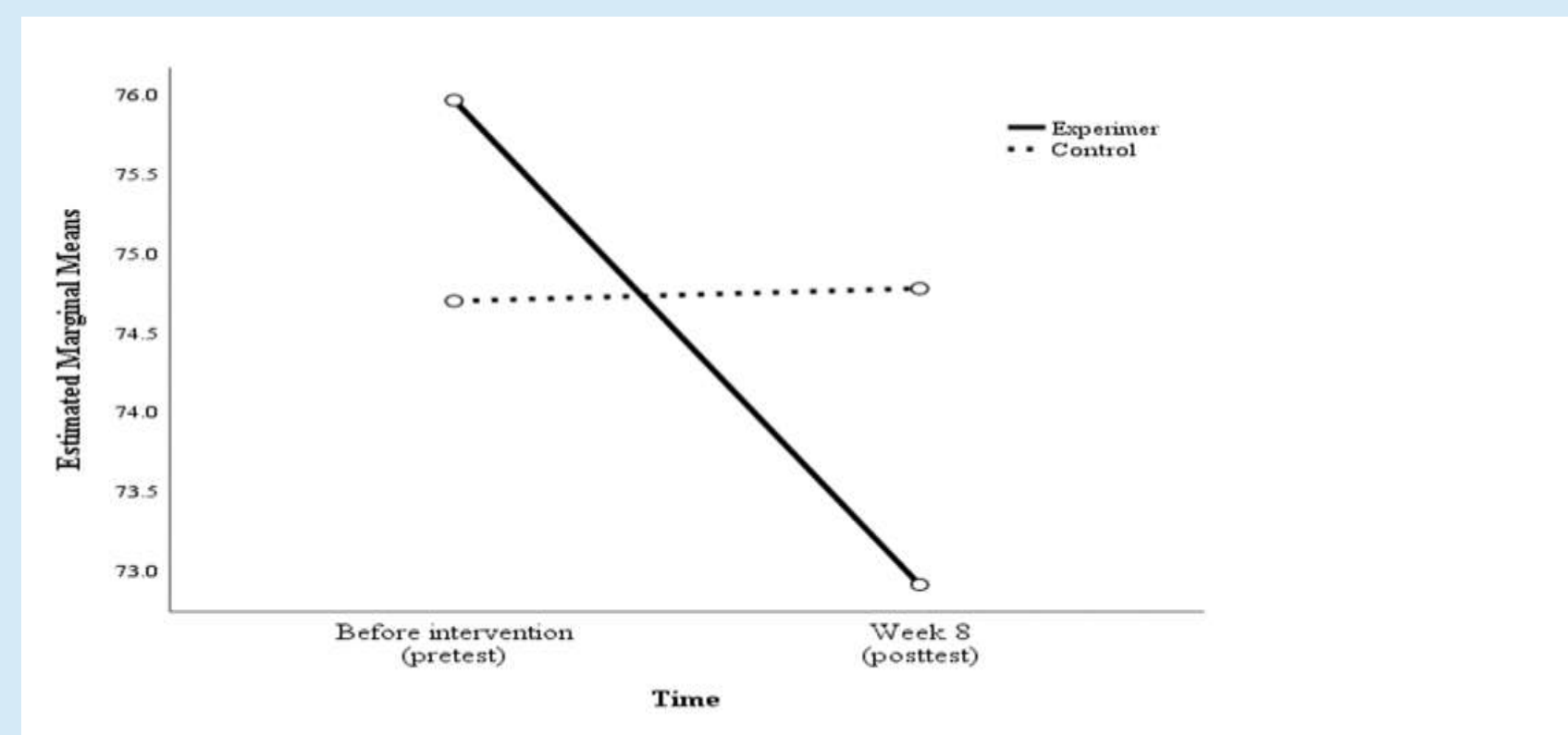
(1) After eight-week respiration training of the experimental group,(A) TP and HF values of the post-test are higher than the pretest with statistically significant differences ($p<0.001$ and $p=0.042$ individually), (B) the score of the quality of life of the post-test from the experimental group is higher than the pretest with a statistically significant difference ($p<0.001$), and (C) the score of post-test of State-Trait Anxiety Inventory is lower than the pretest with a significant difference ($p<0.001$).



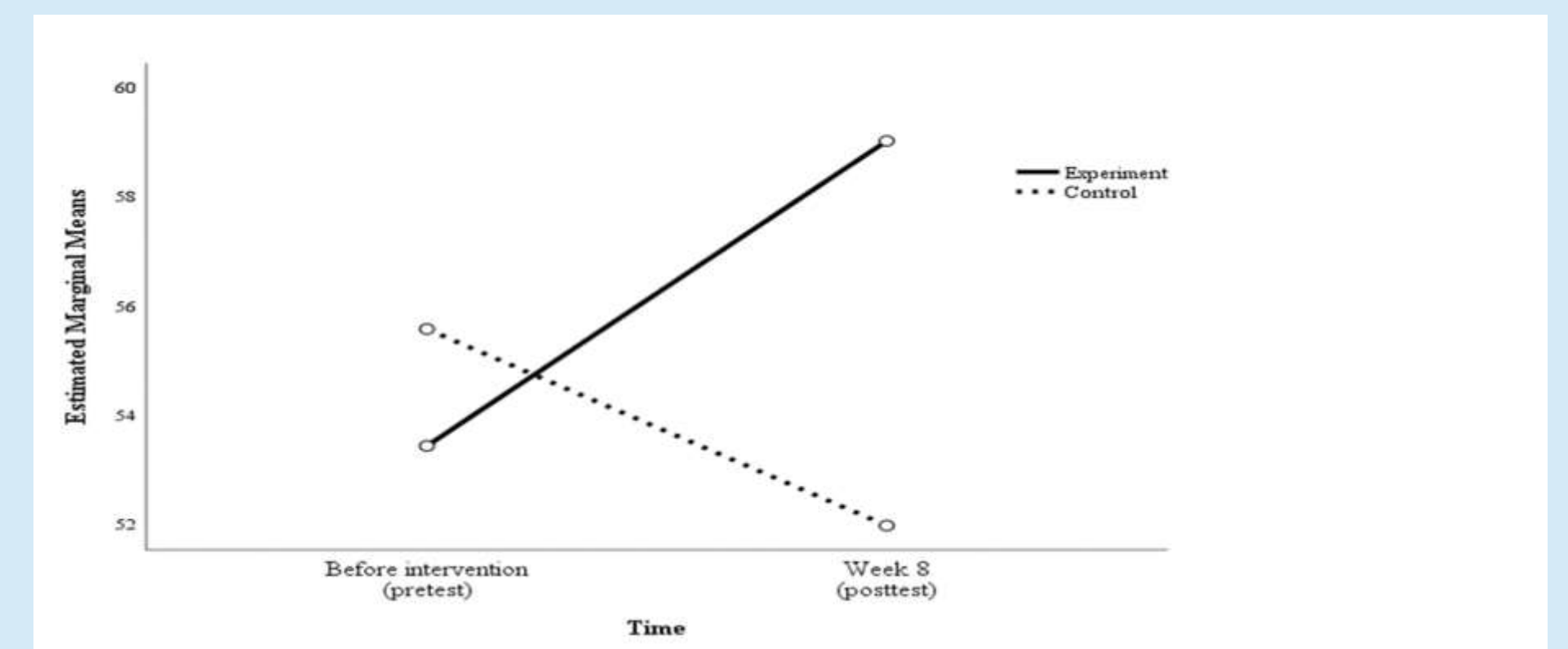
Comparison of the TP value between the two groups after the breath training



Comparison of the HF value between the two groups after the breath training

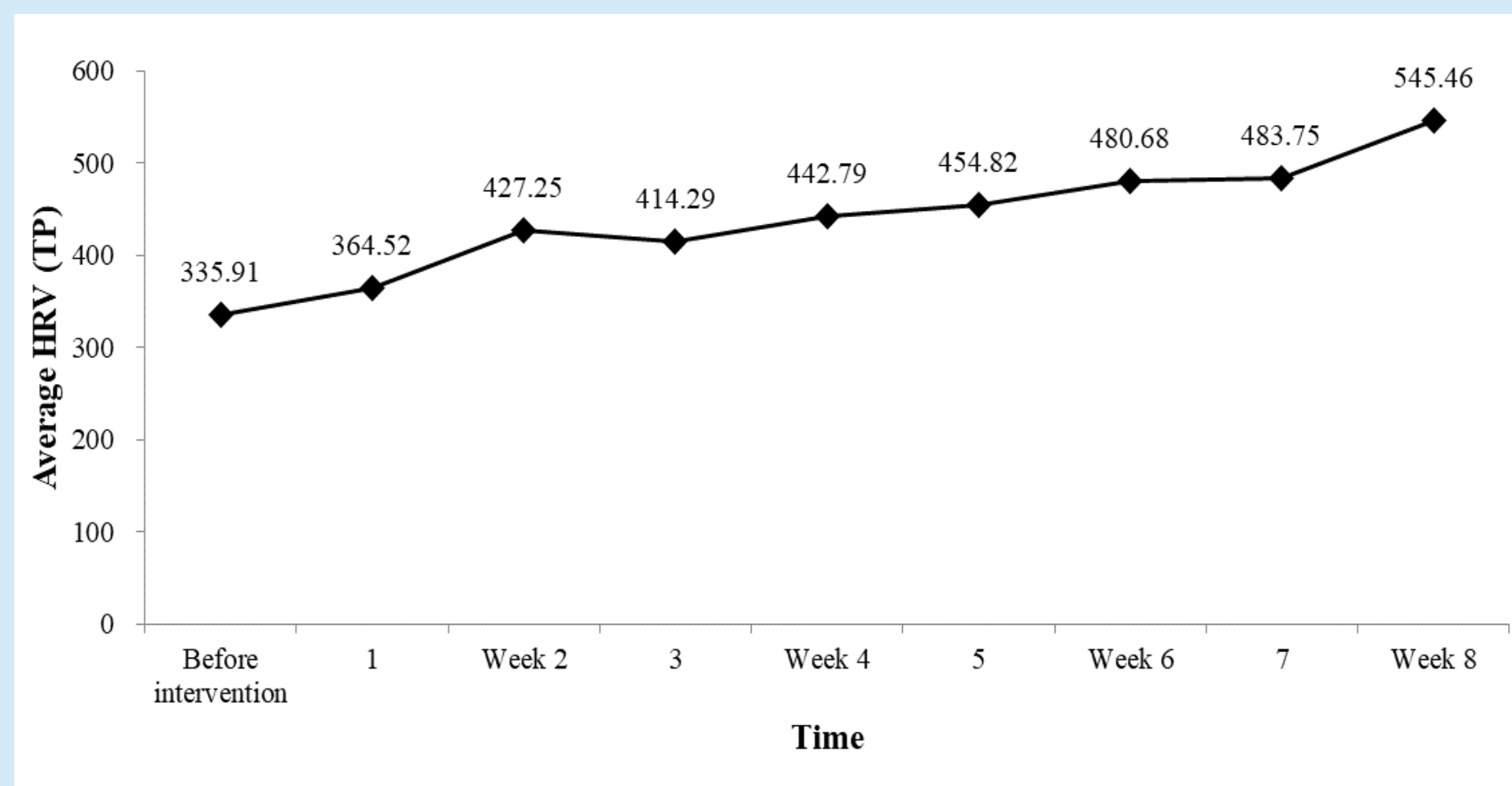


Comparison of state anxiety between the two groups after the breath training

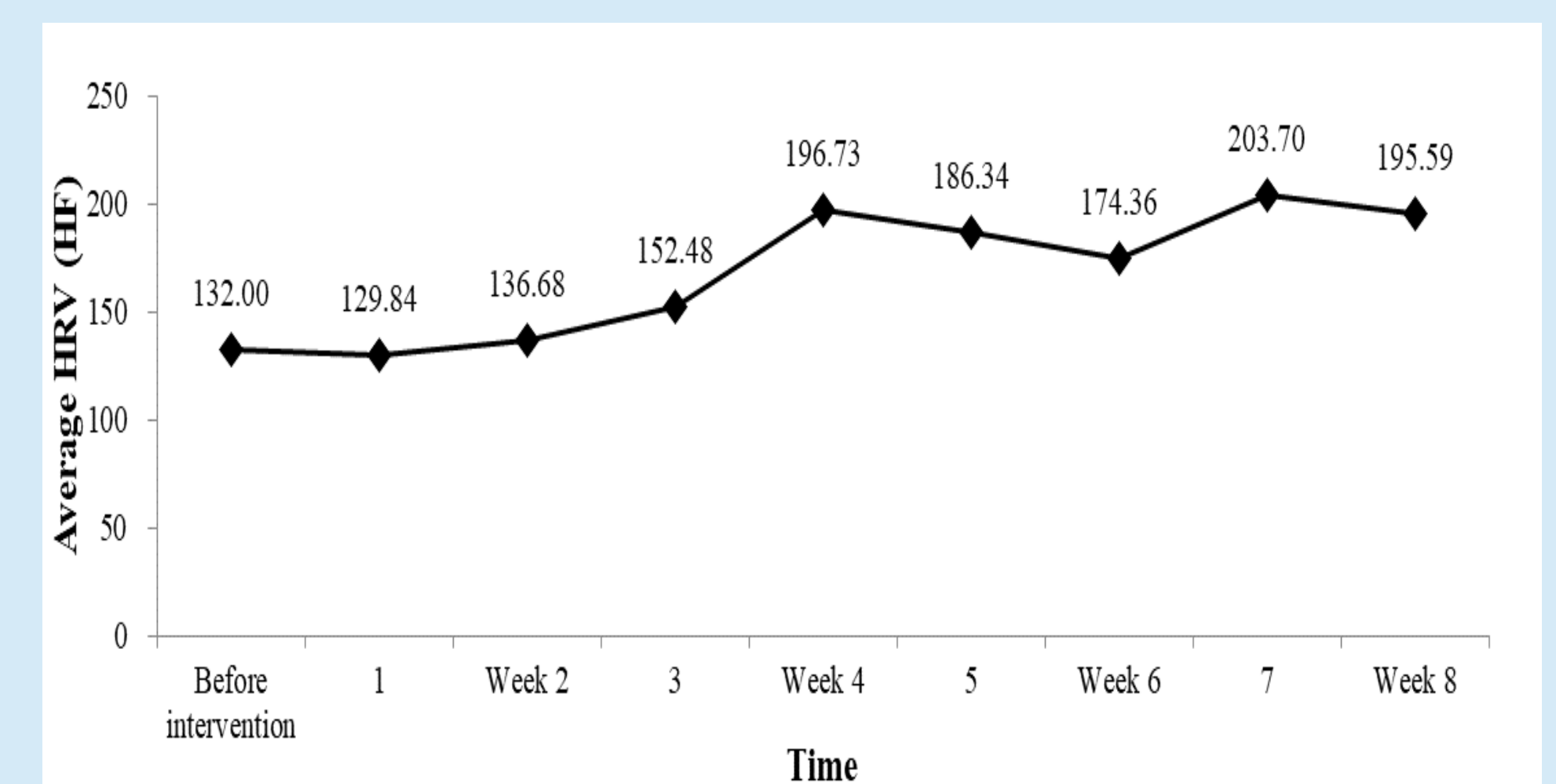


Comparison of QoL between the two groups after the breath training

(2) Two-factor repeated measure ANOVA was performed for statistical analysis. TP of HRV ($F=10.815, p=0.001$), HF of HRV ($F=7.547, p=0.007$), the score of life quality ($F=104.548, p<0.001$), and the score of State-Trait Anxiety ($F=71.310, p<0.001$) between the experimental and control groups reached the effect of interaction on timing and groups. (3) The change in HRV was detected weekly in the experimental group during the eight-week respiration training. The average TP value ($F=6.796, p=0.012$) and HF value ($F=5.951, p=0.018$) of different sampling times of HRV during the investigation show a significant linear trend



Changes in the TP value of the experimental group over the course of the 8-week breath training intervention



Changes in the HF value of the experimental group over the course of the 8-week breath training intervention

CONCLUSIONS

The results demonstrate that after receiving eight-week respiration training, hemodialysis patients can effectively increase overall HRV, enhance parasympathetic nerve activity, reduce State-Trait Anxiety, and improve their quality of life.