

# The Utility of Whole Body Vibration Exercise in Haemodialysis Patients: A pilot study



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## Background

Declining physical capacity in end-stage renal disease (ESRD) patients<sup>1</sup> can be mitigated by physical exercise<sup>2</sup>. Despite evidence that standard exercise maintains and improves physical and psychological condition in ESRD few achieve regular exercise.

Whole Body Vibration Exercise (WBVE) is a novel protocol designed to prevent loss of muscle and bone health during prolonged immobility<sup>3</sup>. WBVE has been shown to benefit frail elderly patients' rehabilitation<sup>4,5</sup>; there no studies in ESRD. In a pilot study, we assessed repeatability and tolerability of WBVE before dialysis sessions thrice weekly to inform the design of a larger randomised controlled study.

## Methods

49 patients were suitable for involvement in the study from a population of 162 patients undergoing regular haemodialysis across three units in NHS Fife. Physical condition and quality of life were assessed at enrolment and after a four week baseline repeatability period. In this pilot study, patients acted as their own controls by direct comparison to their baseline recordings following the subsequent eight weeks of exercise: sessions of three minute of vibration thrice weekly pre-haemodialysis. A further repeated assessment four weeks after discontinuing assessed any residual effects of WBVE.

## Results

41 patients recruited and underwent baseline repeatability assessment. Subsequently, 25 patients completed all assessments and 24 withdrew, 15 for medical reasons (1 died, 2 transplanted, 5 adverse events) Sit to Stand 60sec (STS-60) improved significantly by about 11%,  $P=0.002$ . Tinetti balance, handgrip Duke activity score showed no change. Quality of life domains of Health Overall and Symptoms Listed from KDQOL-SF improved significantly. Improvements maintained 4 weeks after discontinuing WBVE with an improvement in hand grip strength.

## Conclusion

WBVE easily incorporates into the routine of haemodialysis. It is well tolerated and safe and results suggest useful improvements which justify larger randomised controlled study

Vibration EXERCISE  
3 minutes  
3 times a week



## Recruitment

Potential pool	= 162 unselected Dialysis population
Expressed interest	= 89 (55%)
Ineligible	= 27 (30%)
Enrolled	= 49 (22 F, 27 M)
Age 24 – 92, median 70	
Months on dialysis <1 – 145, median 33	
Withdrawn	= 24
<b>Completed study</b>	<b>= 25 (15% of pool)</b>

## Study Withdrawal (n=24)

### Reasons:

- 'medical' (15)
- technical (2)
- other (7)

### Overall, those who withdrew were:

- Older by, on average, 8 years ( $P=0.049$ )
- More frail with a greater risk of a fall ( $P=0.031$ )

## Results (n=25)

### Repeated measures ANOVA

What is the effect of WBVE on:

#### Physical function:

- ✓ Sit to Stand ( $P=0.004$ )
- ✗ Tinetti Balance Score
- ✗ Peak O2 uptake

#### Muscle strength:

- ✗ Hand grip

#### Nutritional status:

- ✗ Fat%, FFM
- ✗ Calf & Arm Circumferences

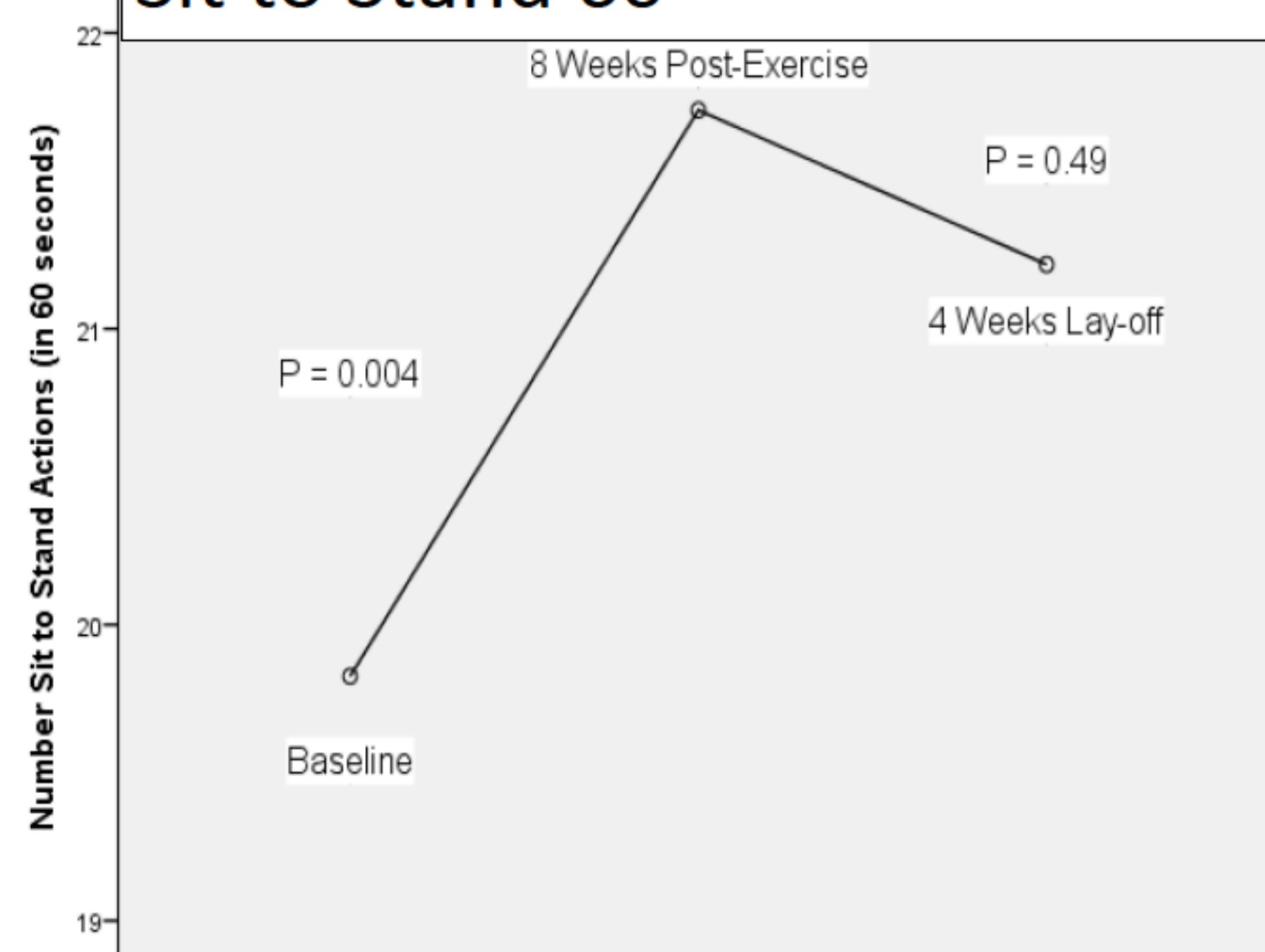
#### Quality of life (domains):

- ✗ Burden of disease
- ✗ Symptom burden
- ✗ Sleep
- ✓ Health Overall ( $P=0.030$ )

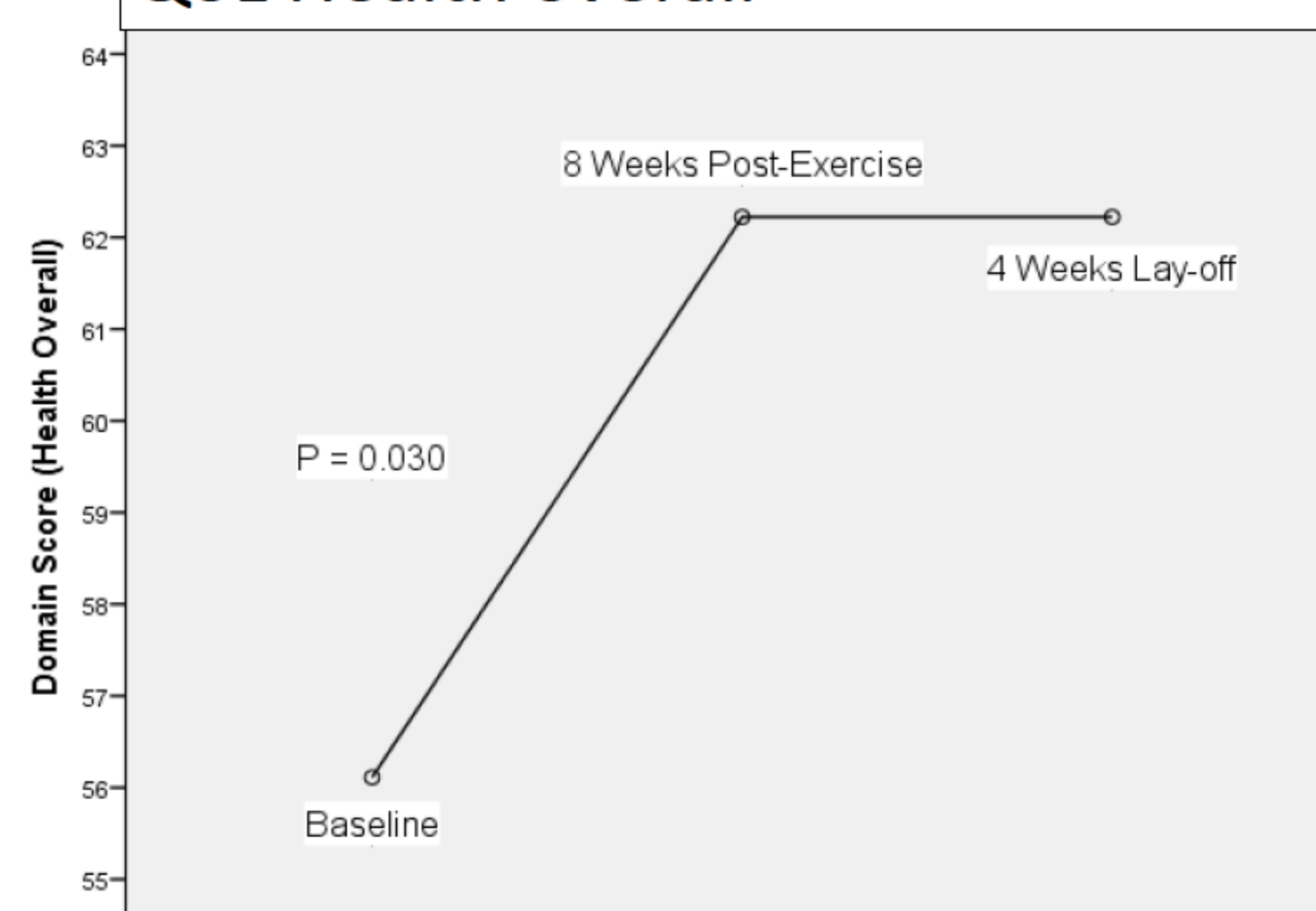
## Patient Experience

"I managed it ok. It was an easy form of exercise"  
 "Aye, it was fun"  
 "Very easy to use and does not leave you tired and short of breath"  
 "First couple of times was difficult due to my poor balance but after that it was ok"  
 "Fine, but felt I could be doing something more energetic"  
 "Fed up by week 4"  
 "Had to ensure colostomy bag was empty and dentures were secure"  
 "I had to stop using it, I felt very dizzy"  
 "Poor eyesight, trouble seeing buttons"  
 "You had to be careful stepping on and off it"

## Sit to Stand 60



## QoL Health overall



## References

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