

# Dietary intakes of Phase III cardiac rehabilitation patients during a six-week exercise training programme

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## Introduction

Cardiac Rehabilitation (CR) is a multifaceted secondary prevention programme where nutritional education is a central component. Given the high prevalence rates of malnutrition in clinical populations, including CR patients (Pathirana et al., 2014), it is of utmost importance that current dietary interventions positively modify dietary behaviour in the UK.

Paradoxically, findings of a recent Cochrane review suggest that nutritional education does not contribute to reductions in death rates and in incidence of further myocardial infarction (MI). Nevertheless, nutritional education is associated with improvements in health related quality of life (Anderson et al., 2017).

Therefore, our aim was to further a) investigate patients' dietary intakes at baseline and after 6 weeks of Phase III CR, and b) assess the effectiveness of the nutritional education session provided as part of a CR programme.

## Methods

- Following NHS ethics approval, 23 eligible male CR patients ( $64 \pm 12$  years,  $87.2 \pm 13.4$  kg,  $28.3 \pm 3.6$  kg.m $^{-2}$ ) enrolled and completed a 6-week Phase III CR programme in Leeds, UK. Patients with valve replacement and heart failure were excluded from the study.
- Patients completed a three-day diet diary (two continual week days and one weekend day) in week one and week six of the CR programme. Following the first diet diary recording, patients received a nutritional education session which included information on cardio-protective eating patterns and details on food labelling.
- Energy requirements were estimated by the updated Oxford equations (Henry, 2005), and macronutrient recommendations by both WHO guidelines (WHO, 2007) and by research recommendations for clinical populations (Bauer et al., 2013)

## Results

Average energy intake (EI) at week one ( $1871.3 \pm 583.7$  kcal) (Figure 1) and six ( $1674.7 \pm 500.2$  kcal) (Figure 2) were below recommendations but this was only significant at week six ( $P < 0.01$ ). EI at week six was reduced compared to baseline ( $-7 \pm 25.3\%$ ,  $P = 0.02$ ).

In week one, patients consumed on average  $0.97 \pm 0.3$ ,  $2.7 \pm 0.94$ ,  $0.76 \pm 0.29$  g·kg $^{-1}$ ·BM·d $^{-1}$  and in week six,  $0.92 \pm 0.32$ ,  $2.5 \pm 0.79$ ,  $0.67 \pm 2.8$  g·kg $^{-1}$ ·BM·d $^{-1}$  for protein, carbohydrate (CHO), and fat respectively. There was a large discrepancy between actual protein intakes and research-led recommendations (Figure 3).

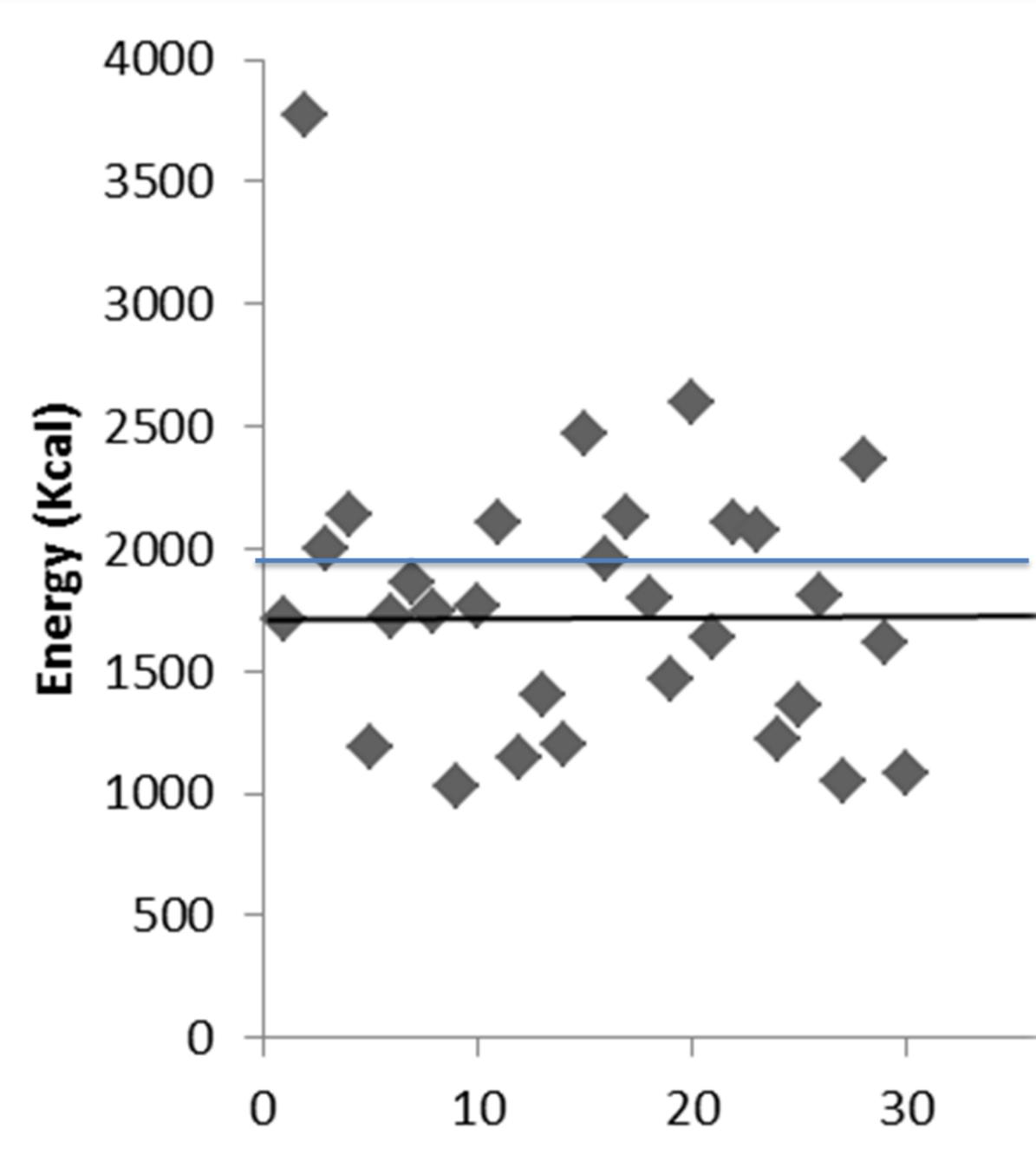


Figure 1. Mean energy intake in week one for all patients. Black line indicates the average, blue line indicates the recommended daily intake.

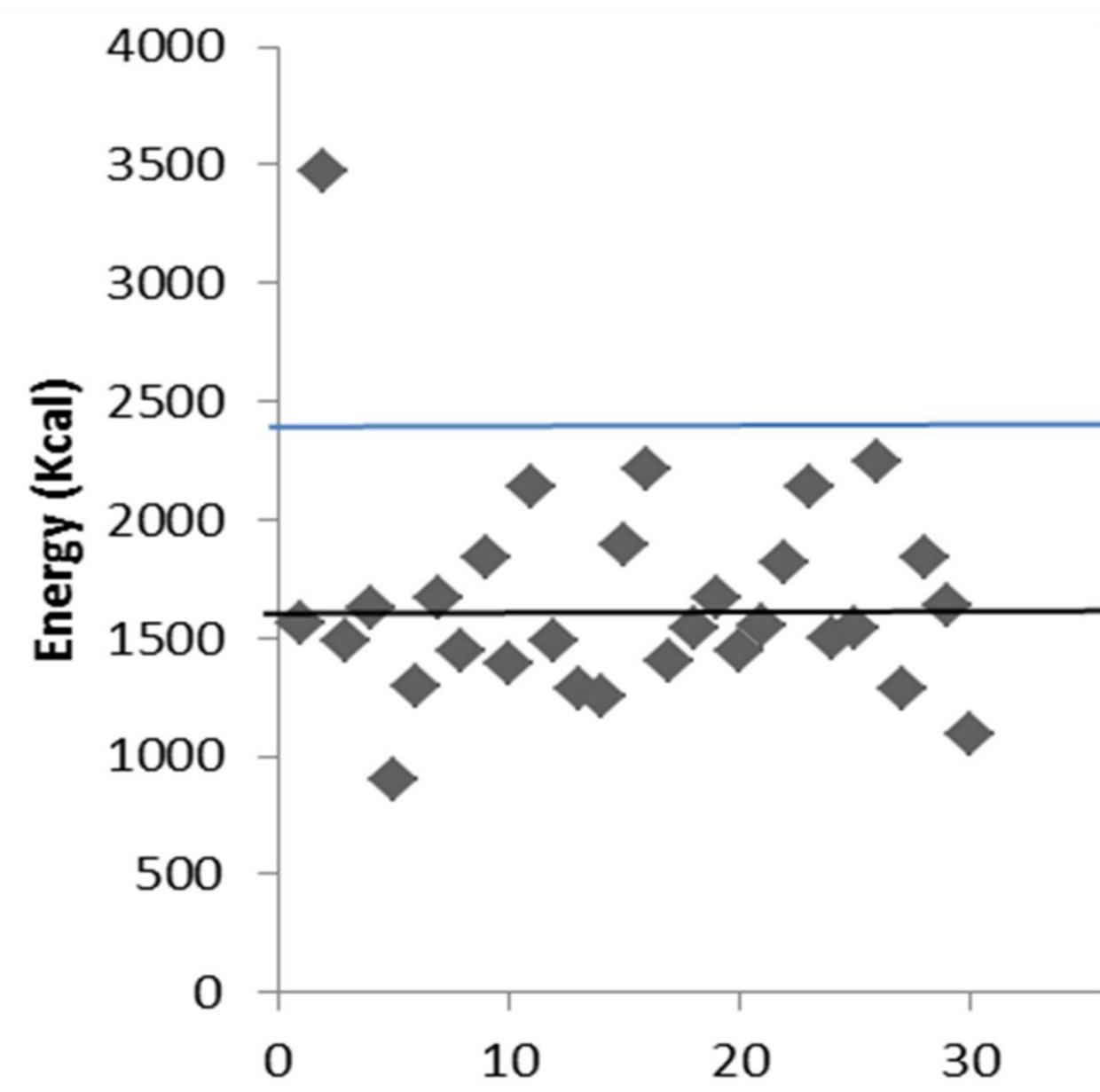


Figure 2. Mean energy intake in week six for all patients. Black line indicates the average, blue line indicates the recommended daily intake.

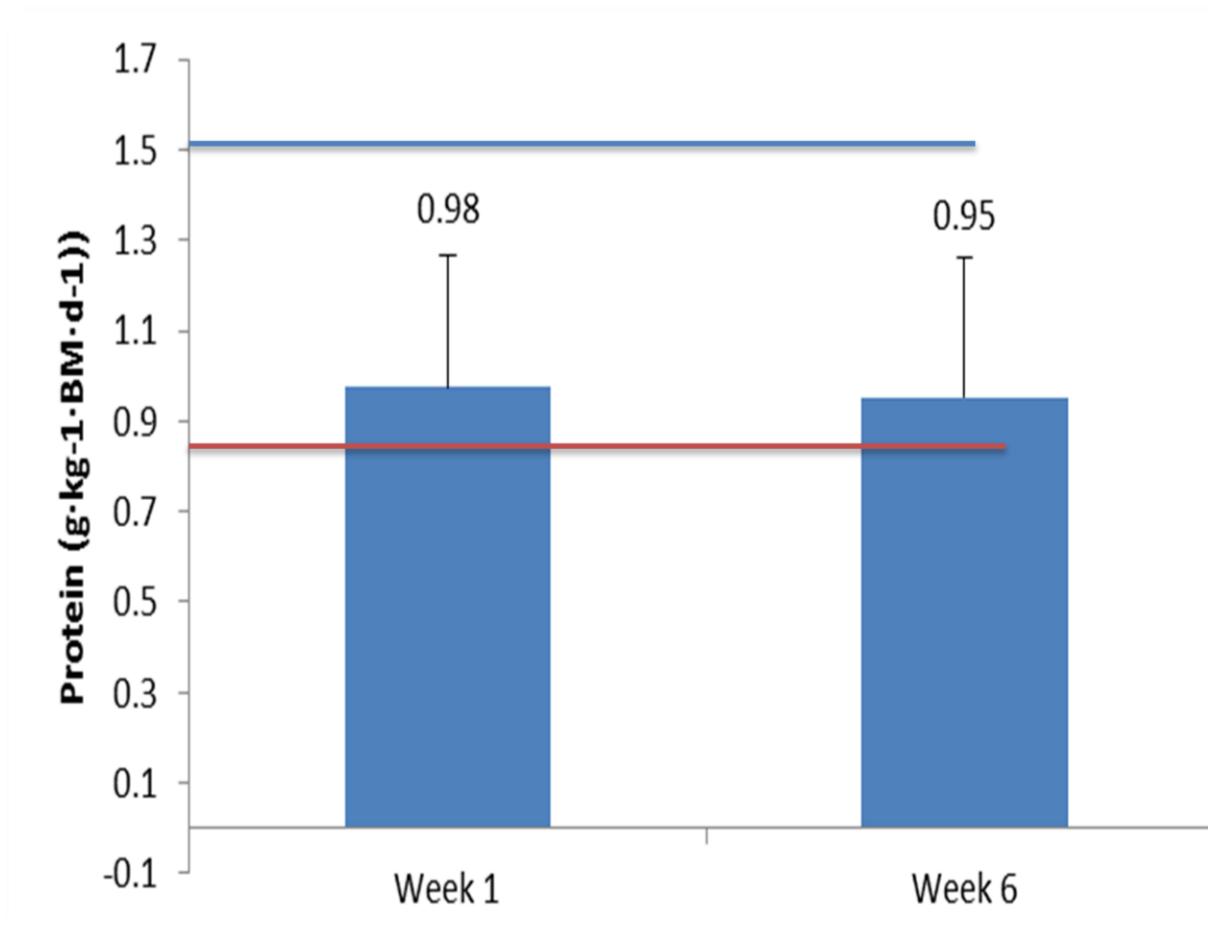


Figure 3. Protein consumption relative to body mass (BM) in week one and week six of the CR programme. Blue line indicates current research recommendations for protein intake for elderly diseased adults. Red line indicates WHO recommendations for elderly adults.

## Conclusions

Our data confirms that in our patients daily energy intake was **below recommendations**. **More noteworthy** is that protein intake was insufficient for individuals recovering from disease. **One nutritional education** session received as part of the CR provision is **not sufficient** to effect positive dietary changes. Therefore, there is a real need to address the dietary deficiencies of CR patients through additional investments in nutritional education.

## Acknowledgments

The authors wish to acknowledge the time and commitment of the research participants.