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## Provision of a daily high protein and high energy meal: effects on the physical and psychological wellbeing of community-dwelling, malnourished elderly adults

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Community-dwelling older adults experience a high prevalence of malnutrition<sup>(1)</sup>, leading to frailty, loss of independence and poorer health including increased mortality and healthcare resource use (HRU)<sup>(2)</sup>. Consumption of a high-quality diet is associated with better health-related outcomes<sup>(3)</sup>. We previously found significantly improved mini nutritional assessment (MNA) and depression scores following 3-weeks of daily meal provisions to healthy community-dwelling elderly participants<sup>(4)</sup>. However, <30% of UK councils provide meal delivery services. This study aimed to determine the impact of longer term (12-weeks) daily provision of nutrient-dense meals (>40% daily energy requirements and >50% recommended daily protein intake) to under-nourished, independently living, community-dwelling elderly adults on physical and psychological outcomes. We hypothesised the meal intervention would significantly improve nutritional outcomes, physical wellbeing and function, and psychological wellbeing.

Participants (n = 56) were randomised (stratified for baseline MNA score and cohabiting or living alone) to receive 12-weeks of meal provisions followed by 12-weeks control (meals first group, n = 28) or, a 12-week control followed by 12-weeks of meal provisions (meals second group, n = 28). Forty-nine participants completed the study (16 males, 33 females; 81.8 ± 7.4 years). MNA, body composition, physical function, self-esteem, and depression were evaluated before and after each 12-week period (baseline, 12-weeks, and 24-weeks). The effect of meal provision was assessed by testing pre-post meal intervention change in both groups via paired t-test. Group effects were combined via meta-analysis (STATA ver17). The retention of the meal provision effect was tested in the meals first group, by testing the change from the end of meal provision versus 12-weeks followup control via paired t-test.

Meal provisions significantly improved energy and protein intakes (mean effect 311kcal Cohen’s D = 0.52 (95% CI 0.22 to 0.82), p<0.001; 0.24 g.kg<sup>-1</sup> Cohen’s D = 0.52 (95% CI 0.19 to 0.81), p<0.001, respectively), MNA score (mean effect 2.6 points Cohen’s D = 1.14 (95% CI 0.78 to 1.50), p<0.001), and handgrip strength (mean effect 1.5kg Cohen’s D = 0.36 (95% CI 0.06 to 0.66), p = 0.02), but did not change levels of depression or self-esteem. Energy and protein intake decreased by 85% and 94% respectively upon return to habitual diet for the 12-week follow up. Sixty-eight percent of the favourable effect of the meal intervention on MNA score remained after the 12-week follow-up period, whilst handgrip strength reverted to baseline.

Provision of nutrient-dense meals to community-dwelling elderly adults for 12-weeks improved nutritional status and handgrip strength, indicative of reduced frailty risk. Benefits were not retained on withdrawal of the intervention, suggesting a need for sustained interventions in this cohort to meet nutritional needs. Future research is needed to identify optimal meal delivery service designs to support expansion of home-delivered meals to all eligible older adults to improve health-related outcomes and consequently reduce HRU.

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### References

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