THE EFFECT OF A MEAL REPLACEMENT SHAKE INTERVENTION ON STAIR CLIMB PERFORMANCE IN OVERWEIGHT AND OBESE FIREFIGHTERS

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INTRODUCTION

- Overweight (OW) and obesity (OB) prevalence are higher in firefighters (FF) than the public[1] and may negatively impact occupational task performance (e.g. stair climb [SC] performance).[2]
- Unpredictable call volumes and times causing irregular eating schedules may impact obesity rates.[3]
- Meal replacement (MR) shakes offer a practical approach and minimal intervention to consume nutrient dense and reduced energy meals.[4]

OBJECTIVE

The purpose of this study was to examine the effect of a MR intervention on SC performance in OW and OB firefighters.

PARTICIPANTS

Forty-five OW and OB firefighters volunteered for a 14-week cluster randomized controlled trial.

Table 1. Participant demographics at baseline testing (mean ± SD)

Age (yrs)	Stature (cm)	Body Mass (kg)	BMI (kg/m^2)
37.5 ± 7.3	179.5 ± 7.2	106.7 ± 20.2	33.0 ± 4.8

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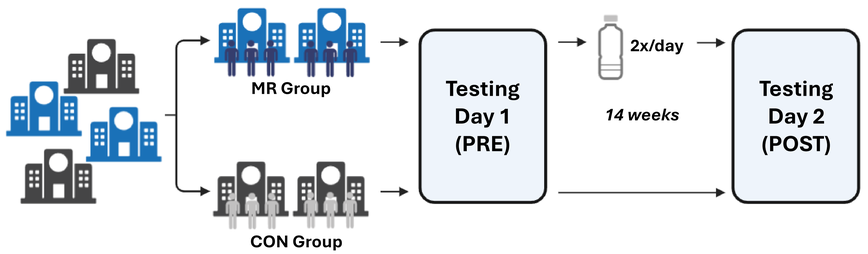
PRACTICAL APPLICATION

MR interventions may be a practical strategy to aid in weight loss, fat redistribution, and improve recovery following strenuous FF tasks. These results provide fire administrators and tactical strength and conditioning practitioners with a minimal nutritional strategy to enhance FF health and performance.

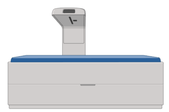
METHODS



Assessments:

Body Composition

- Stature, body mass (BM), DXA scan
- Outcomes: BM, trunk/legs percent body fat ratio (T/L %BF)



Stair Climb Performance

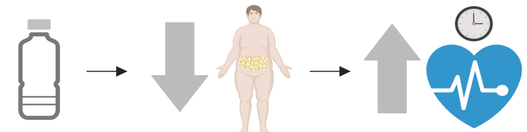
- Fitted with a HR monitor and weighted vest (22.7kg)
- Outcomes: SC time, SC HRpost, SC HR1min, SC HRrec

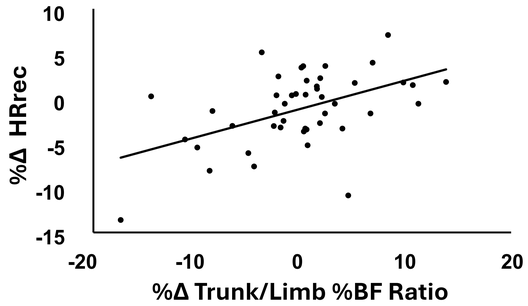
Statistical Analysis:

- All analyses utilized a linear mixed model on change from PRE, and PRE values as a covariate and a random effect for cluster (station).
- Partial correlation coefficients were used to explore the relationship between the %ΔSC HRrec and %ΔT/L %BF, while controlling for %ΔBM.

RESULTS

- There were no intervention effects on SC time (P=0.942), SC HRpost (P=0.235), or SC HR1min (P=0.074).
- The MR group experienced a greater change in SC HRrec (MR:-3.7±9.9bpm; CON:+6.1±8.3bpm; P<0.001), T/L %BF (MR:-0.02±0.05; CON:+0.007±0.03; P=0.036), and BM (MR:-1.4±3.1kg; CON:-0.2±2.6kg; P=0.022) compared to the CON group.
- A greater %Δ in SC HRrec was associated with a greater %Δ in T/L %BF (r=0.387; P=0.010).





CONCLUSION

The MR intervention did not impact SC time, but did improve HRrec following a SC task. A reduction in the ratio of trunk/leg adiposity, when controlling BM changes, was associated with greater HRrec from SC tasks. It may be speculated that reduced trunk adiposity reduces inflammation and improves HRrec.[5]

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