

Long-Term Adherence and Clinical Outcomes Following a Mediterranean Diet Intervention in Metabolic Associated Steatotic Liver Disease (MASLD)

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Background

Diet is integral in the management of metabolic dysfunction-associated steatotic liver disease (MASLD) with both the Mediterranean Diet (MedDiet) and low-fat diet (LFD) proving effective in the short-term¹. However, evidence for long-term sustained effects remains limited. The aim of this study was to assess the sustained effects of a MedDiet and LFD intervention on anthropometry, inflammatory markers, and long-term dietary adherence in participants of the MEDINA randomised controlled trial² (RCT).

Research Design

This study reports 6 and 12-month follow-up data from the MEDINA RCT conducted in Melbourne, Australia. Participants were randomised to a MedDiet (n=13) or LFD (n=14). Dietary adherence was assessed using validated PREDIMED checklists, while anthropometric and inflammatory measures were collected from baseline through to 12 months post-intervention. Within- and between-group differences over time were analysed using repeated-measures ANOVA and independent t-tests, with statistical significance set at $p < 0.05$.

Results

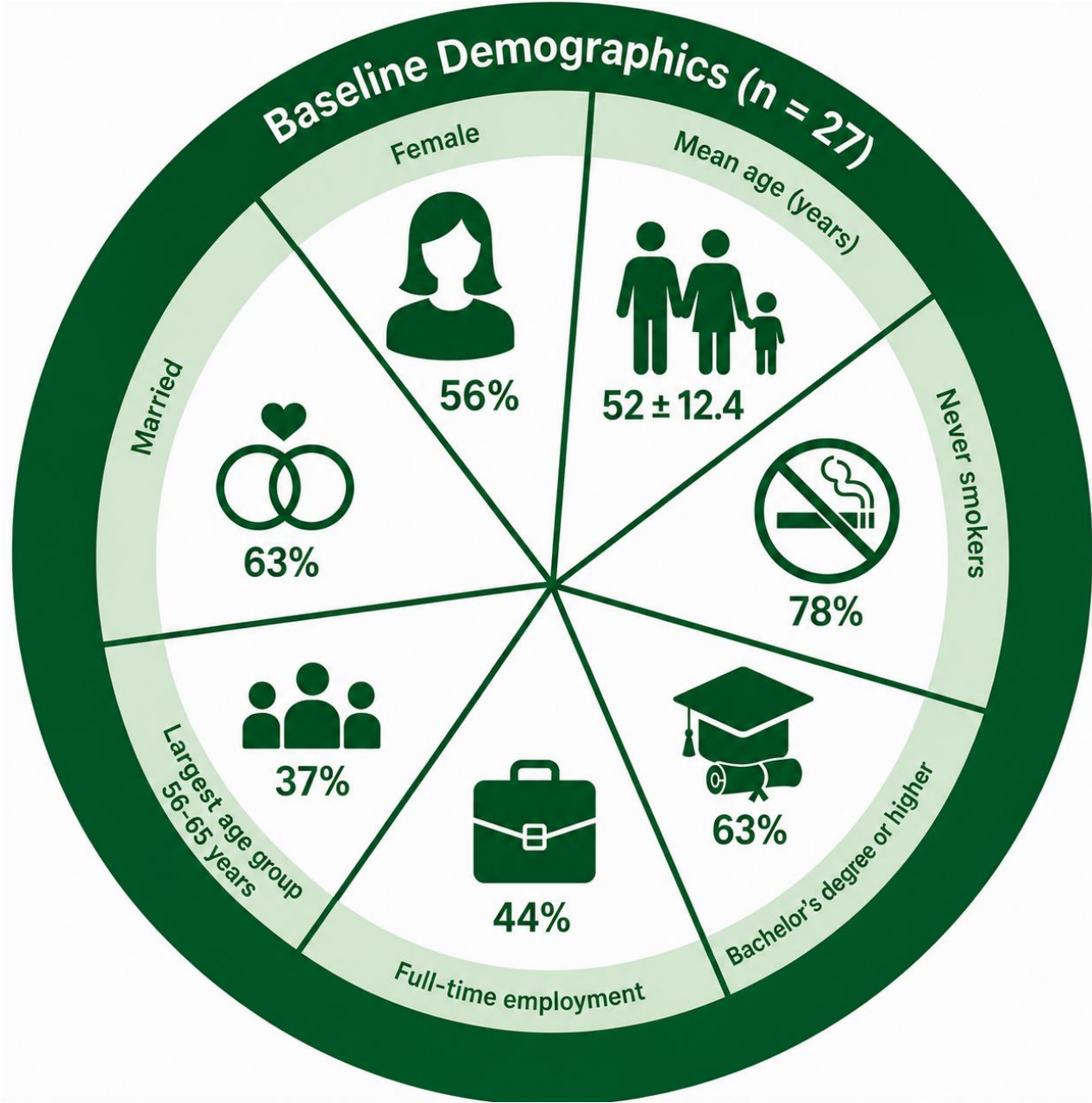


Figure 1: Baseline demographic of MEDINA participants that completed 12M follow up.

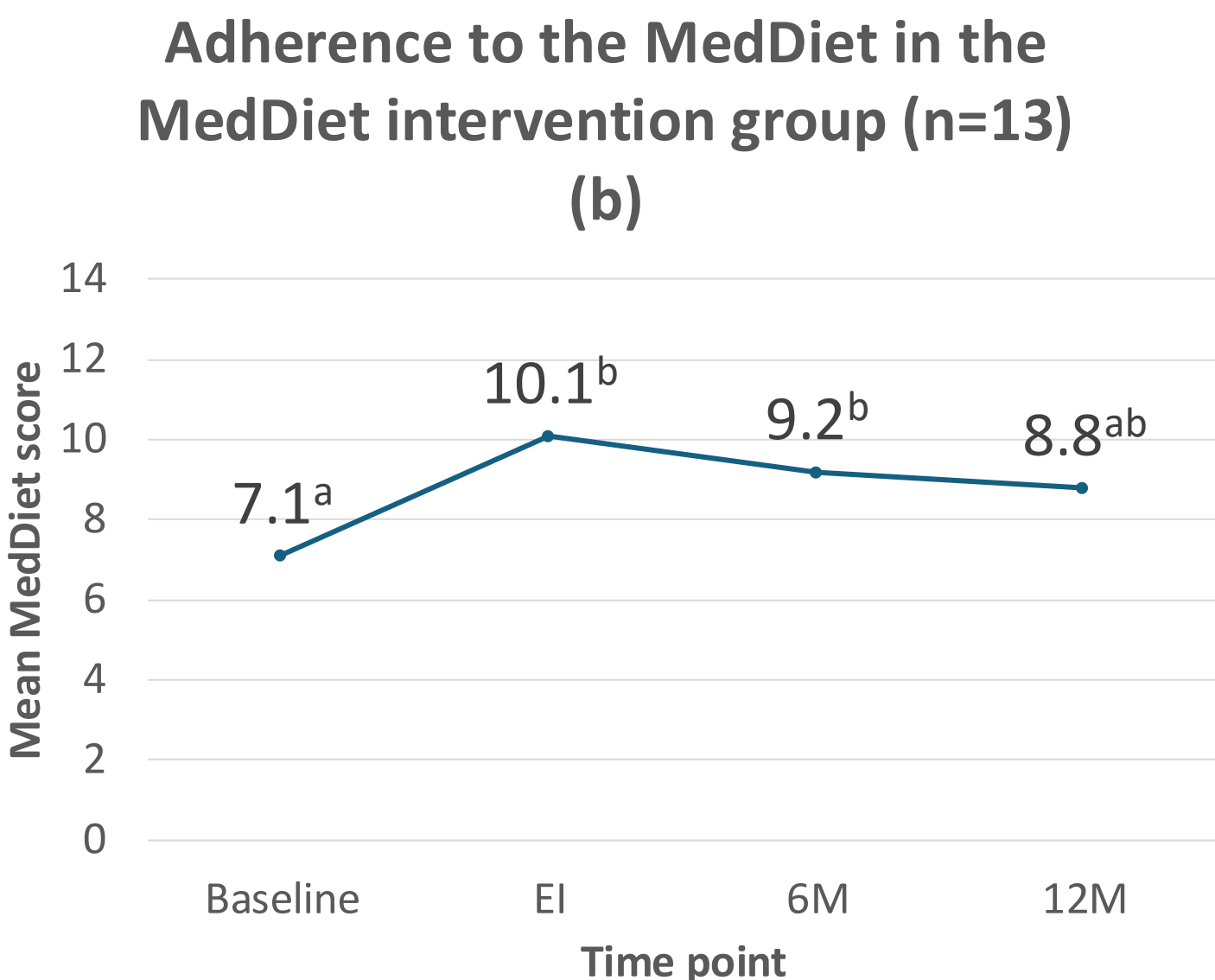
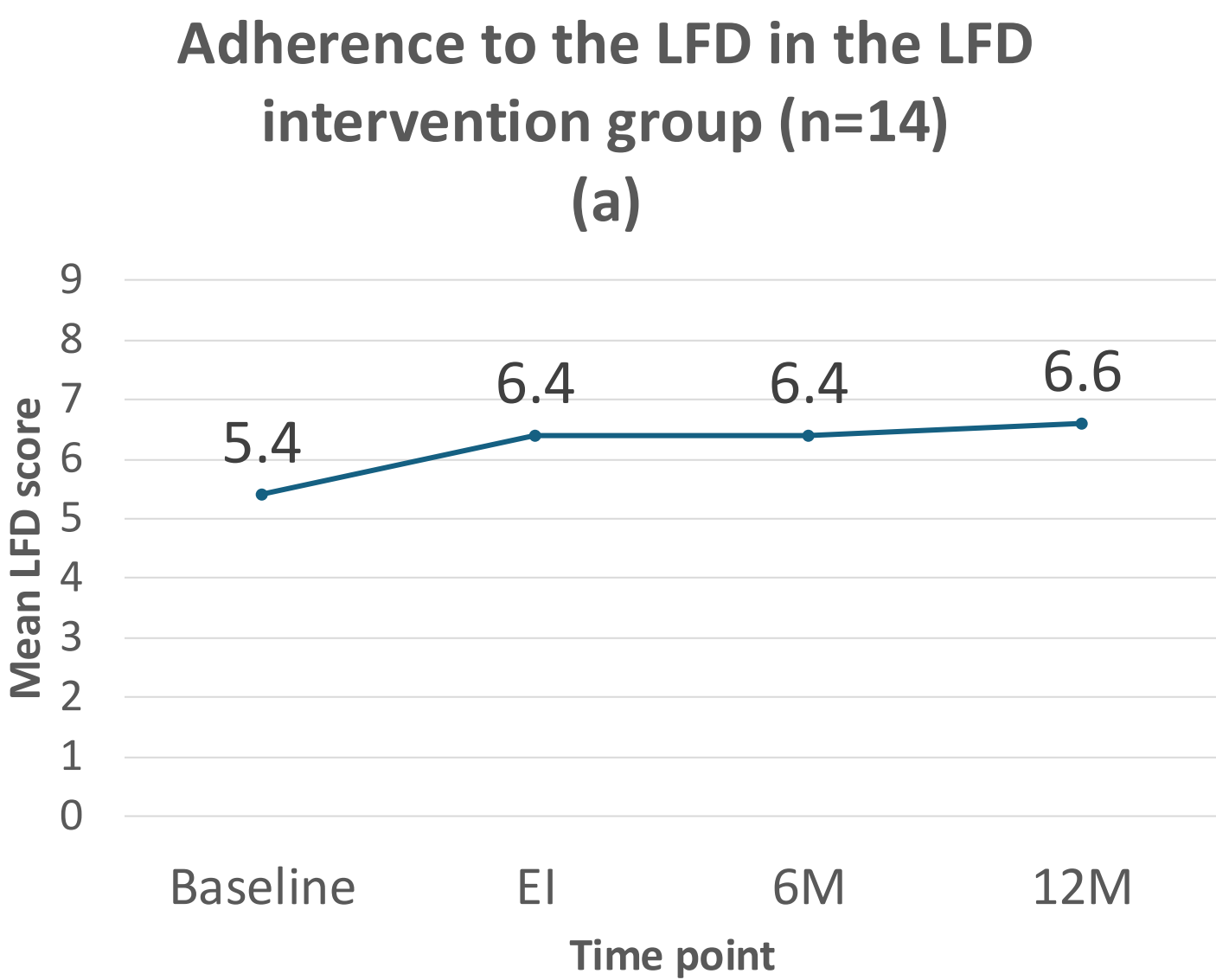
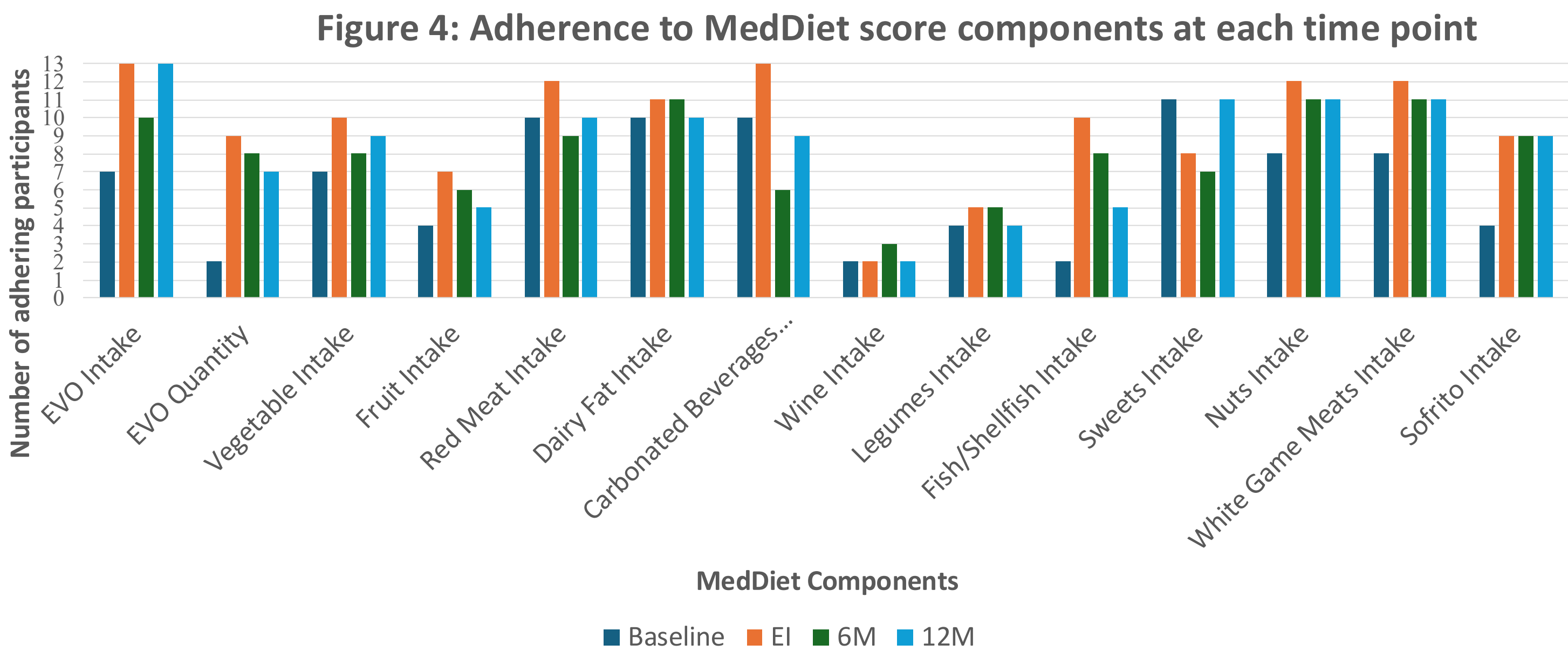
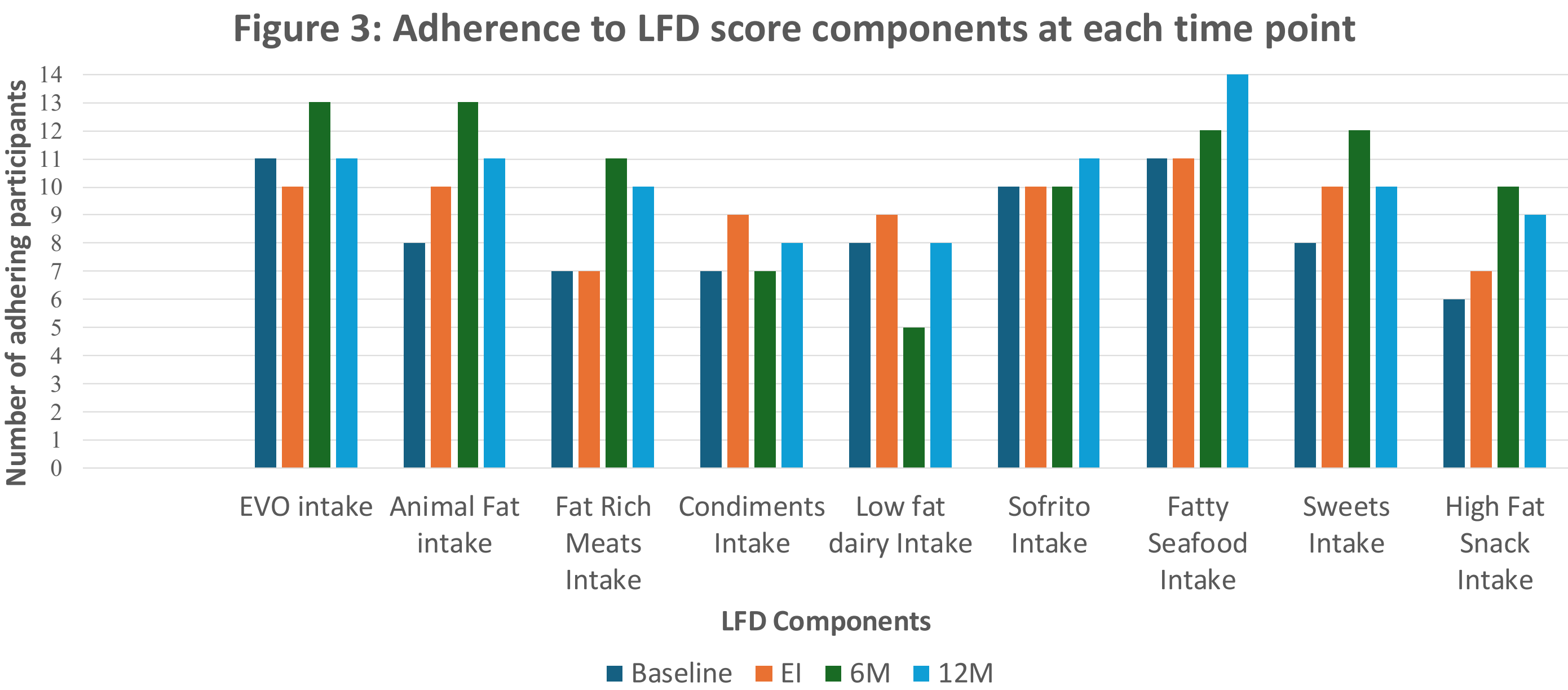


Figure 2: (a) Mean dietary adherence scores for the LFD at each of the four time points; (b) Mean dietary adherence scores for the MedDiet at each of the four time points. Different superscript letters (a, b) indicate statistically significant differences between time points based on post-hoc comparisons ($p < 0.05$).

- There were no significant differences in baseline demographic characteristics between diet groups for the 27 participants that completed a 12M follow-up appointment after the MEDINA intervention.
- No significant changes in dietary adherence were observed in the LFD group across all time points ($p > 0.05$ for all). The MedDiet group showed significantly improved adherence from baseline to the end of intervention ($p = 0.006$) and baseline to 6 months ($p = 0.009$). The MedDiet group showed significantly greater improvement in dietary adherence than the LFD group from baseline to EI ($p = 0.025$).



Figures 3 and 4: The number of participants that adhered to each of the MedDiet and LFD components at each time point.

- Adherence to both the MedDiet and LFD interventions improved over time. In the MedDiet group, the greatest adherence was observed at the end of the intervention, particularly for EVO, fruits, vegetables, legumes, fish, nuts, and reduced sweets and carbonated beverage intake. In the LFD group, adherence also increased from baseline and remained above baseline at 12 months, with the highest adherence reported at 6 months post-intervention.
- Participants were stratified above and below the mean 12-month dietary adherence score within each diet group to assess associations between dietary adherence and clinical outcomes. Anthropometric variables assessed included body weight, BMI, waist circumference, fat mass, visceral fat, and blood pressure. Across both the Low-Fat Diet (LFD) and Mediterranean Diet (MedDiet) groups, participants with higher dietary adherence generally trended toward more favourable anthropometric outcomes; however, these differences were not statistically significant (all $p > 0.05$).
- Inflammatory markers assessed included adiponectin, resistin, IL-6, and leptin. Participants above the mean MedDiet adherence score demonstrated lower IL-6, resistin, and leptin concentrations compared with those below the mean adherence score. Although no statistically significant differences were observed, the overall direction of findings suggests that greater long-term dietary adherence may contribute to improved metabolic and inflammatory profiles in individuals with MASLD.

Conclusion

Neither diet produced sustained anthropometric or inflammatory changes at 12 months. However, clinically meaningful improvements in cardiometabolic markers were evident. These findings suggest ongoing behavioural and dietetic support is likely required to maintain long-term adherence and optimise clinical outcomes.

References

1. Haigh, L., Kirk, C., El Gendy, K., Gallacher, J., Errington, L., Mathers, J.C., and Anstee, Q.M. (2022) 'The effectiveness and acceptability of Mediterranean diet and calorie restriction in non-alcoholic fatty liver disease (NAFLD): A systematic review and meta-analysis', Clinical Nutrition, 41(9), 1913–1931, available: <https://doi.org/10.1016/j.clnu.2022.06.037>.

2. George, E.S., Reddy, A., Nicoll, A.J., Ryan, M.C., Itsiopoulos, C., Abbott, G., Johnson, N.A., Sood, S., Roberts, S.K., and Tierney, A.C. (2022) 'Impact of a Mediterranean diet on hepatic and metabolic outcomes in non-alcoholic fatty liver disease: The MEDINA randomised controlled trial', Liver International, 42(6), 1308–1322, available: <https://doi.org/10.1111/liv.15264>.