THE UNIVERSITY OF MELBOURNE

Comparing the effect of metabolic-bariatric surgery with a very-low energy diet (VLED) on preference for highly palatable foods.

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125 YEARS ST VINCENT'S HOSPITAL MELBOURNE

Conflicts of interest

- None to declare.

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Clinical context

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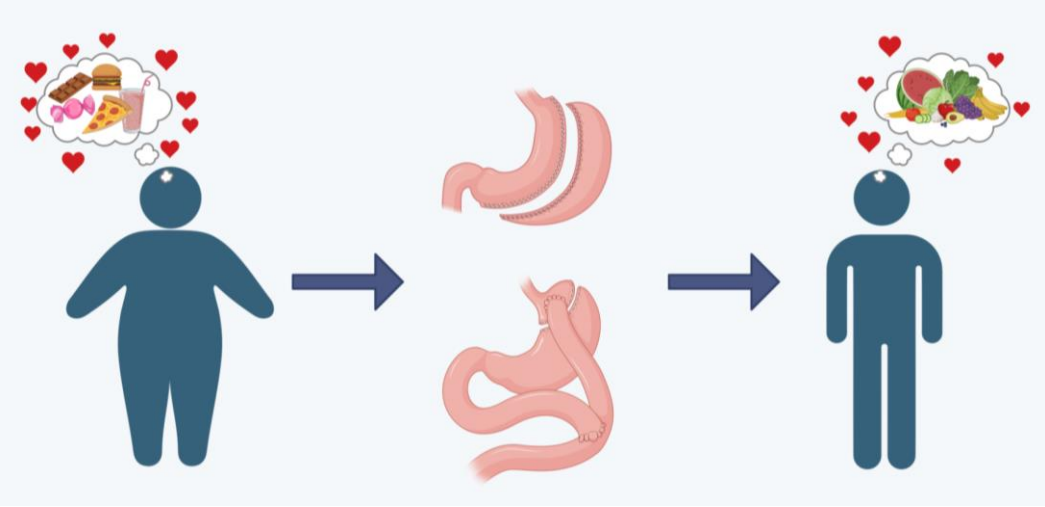
- More than 2 billion adults are living with obesity globally (WHO, Overweight & Obesity, 2025).
- Consumption of food high in sugars and fats is associated with increased risk of obesity (Beslay et al. 2022).
- Metabolic-bariatric surgery is the most effective and durable treatment for obesity and its related diseases *(Pipek et al. 2024)*.
- Up to 75% of patients report a reduced preference for sweet and fatty foods post-surgery (Coluzzi et al. 2016).



MBS & food preferences

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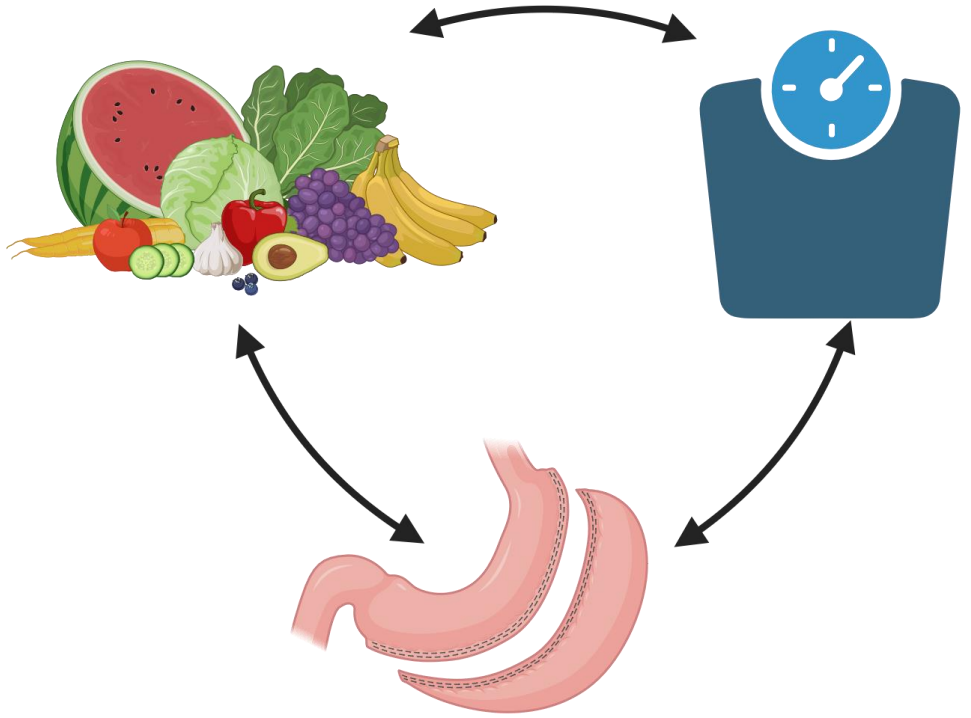
- Possible mechanisms of post-surgical food preference changes:
  - Intrinsic – e.g. resulting from gastrointestinal rearrangement
  - Secondary to weight loss
  - Conditioned dietary avoidance
  - Responsibility to meet clinician expectations



Aims and hypothesis

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1. **To investigate the effect of metabolic-bariatric surgery (MBS) and very low-energy diet (VLED) on preference for highly palatable food.**
   - *Preference for sweet and fatty foods will be reduced after MBS but not VLED.*

2. **To investigate the relationship between food preference changes and weight loss after VLED and MBS.**
   - *Reduced preference for sweet and fatty foods will be associated with greater weight loss post-surgery.*

Study design

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- Observational, pre-post study
- Food preference changes measured using:
  - **Sweet Taste Questionnaire (STQ)** (Kampov-Polevoy et al. 2006)
  - **Fat Preference Questionnaire (FPQ)** (Ledikwe et al. 2007)

Inclusion criteria	Exclusion criteria
• Adults (≥18 yrs) • Primary laparoscopic sleeve gastrectomy or Roux-en-Y gastric bypass. • BMI ≥40 kg/m2, or ≥35 kg/m2 with at least one obesity-related comorbidity.	• Medication for diabetes and/or weight management • Other MBS procedures – e.g. revisional surgeries, OAGB. • Unable to provide informed consent in English

Study timeline

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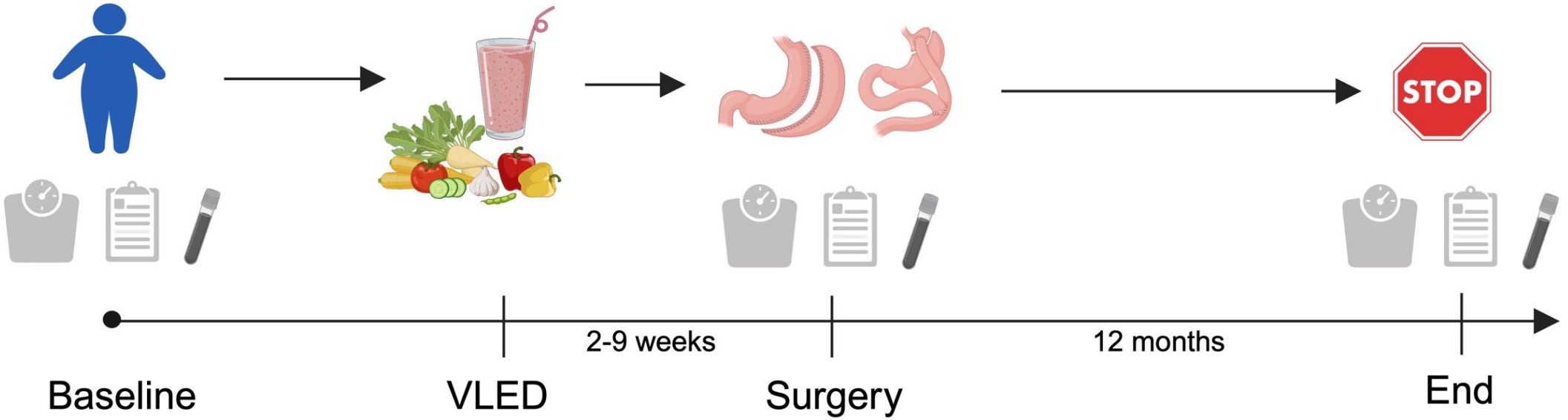
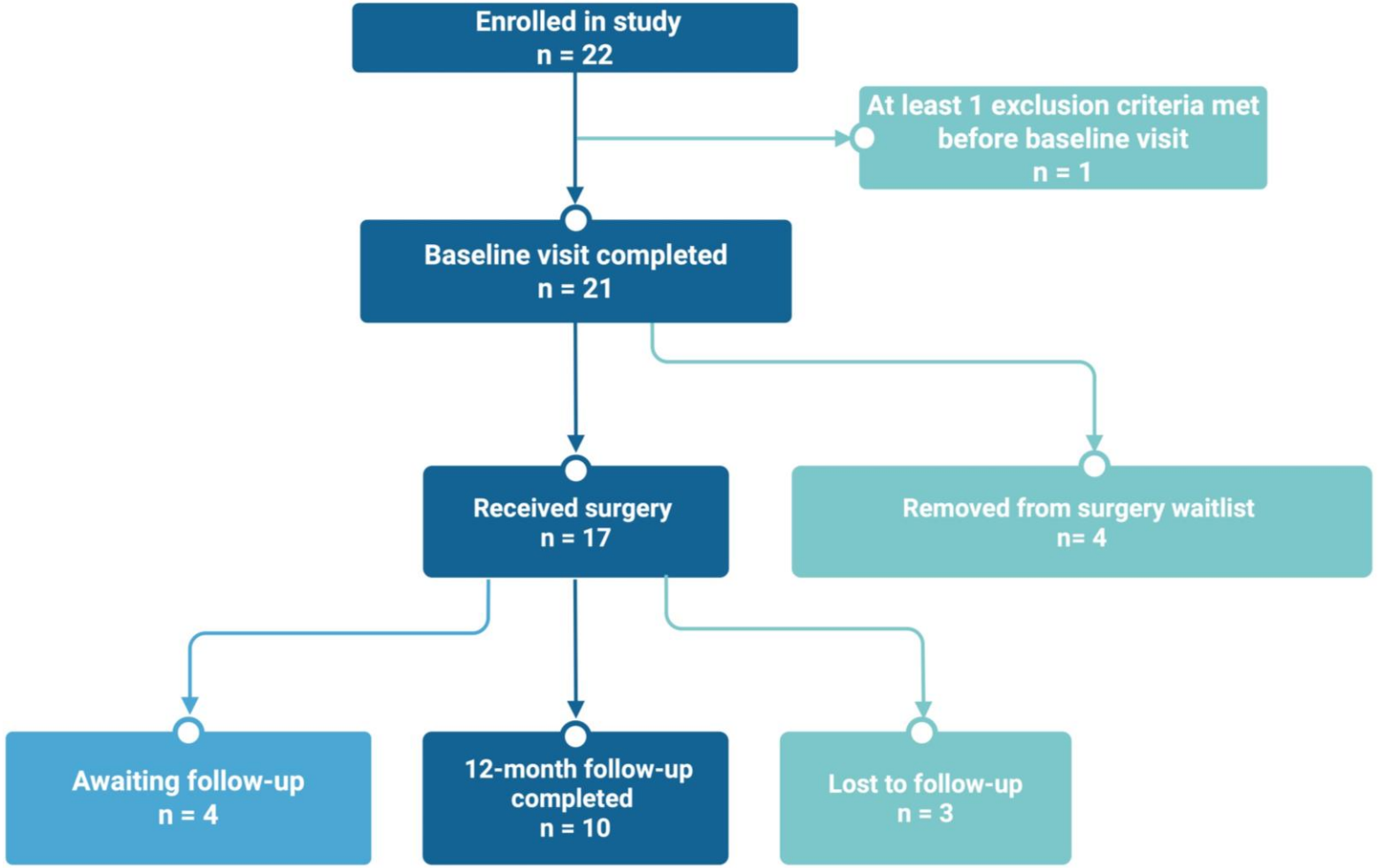


Participants at baseline



	Baseline
N	10
Age (y)	52.5 ± 18.5
Female sex (%)	6 (60%)
Weight (kg)	146.0 ± 17.5
BMI (kg/m^2)	52.5 ± 6.6
HbA1c %	6.0 ± 0.7
Insulin (mmol/L)	14.0 ± 11.8
Total cholesterol (mmol/L)	4.8 ± 2.1
Triglycerides (mmol/L)	1.3 ± 0.9

Weight loss and metabolic improvements occur after surgery and VLED

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	Post-VLED		Post-surgery	
	value	*Δ from baseline*	*value*	*Δ from post-VLED*
Weight (kg)	140.0 ± 16.0	**-5.8 ± 12.3***	95.0 ± 29.5	**-41.0 ± 17.3****
BMI (kg/m²)	49.5 ± 4.3	**-2.3 ± 3.9***	35.1 ± 7.1	**-14.8 ± 6.0****
HbA1c %	5.7 ± 0.7	**-0.2 ± 0.4***	5.1 ± 0.6	**-0.3 ± 0.5****
Insulin (mmol/L)	6.0 ± 15.5	-6.0 ± 10.0	3.0 ± 4.3	**-3.0 ± 9.0***
Total cholesterol (mmol/L)	3.6 ± 1.0	**-1.4 ± 1.0****	4.2 ± 0.8	+0.8 ± 1.4
Triglycerides (mmol/L)	1.5 ± 0.6	+0.3 ± 1.0	0.9 ± 0.4	**-0.9 ± 1.0****

*Analysed using Wilcoxon matched-pairs signed rank test. Presented as difference between medians (± IQR). *P<0.05 **P<0.001*

Bariatric surgery but not VLED reduces preference for high fat foods

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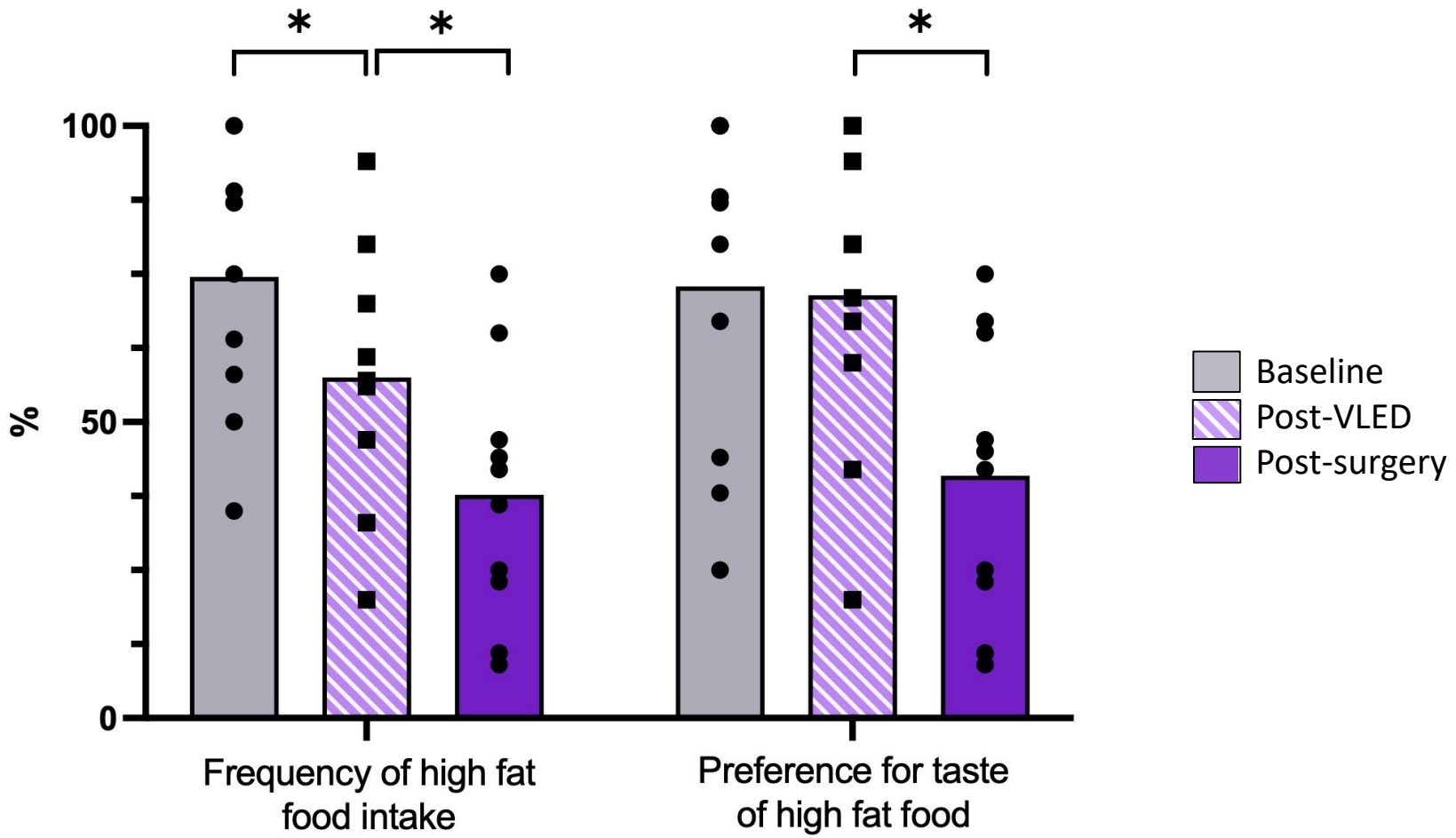

*Fat Preference Questionnaire. Analysed using Wilcoxon matched-pairs signed rank test. Presented as difference between medians (± IQR). *P<0.05*

No significant change to sweet preference after either intervention

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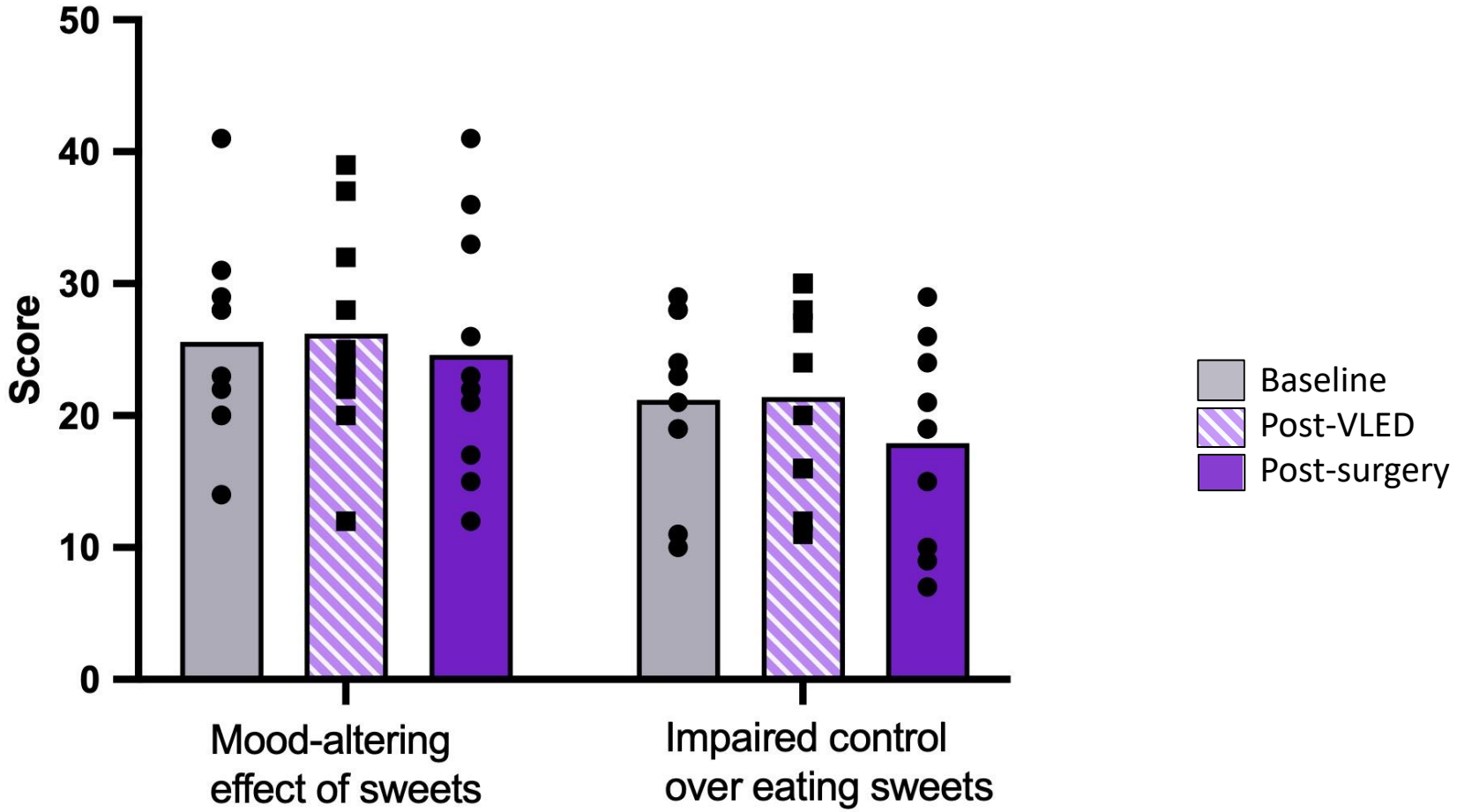

*Sweet Taste Questionnaire. Analysed using Wilcoxon matched-pairs signed rank test. Presented as difference between medians (± IQR). *P<0.05*

Changes to food preference were not associated with weight loss

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	Post-VLED (day-of-surgery)		Post-surgery (12-month follow-up)	
	Spearman r	p-value	Spearman r	p-value
%TWL - Δ STQ mood	0.25	0.48	0.00	0.99
%TWL - Δ STQ control	0.01	0.99	0.20	0.62
%TWL - Δ FPQ frequency	-0.47	0.17	0.10	0.81
%TWL - Δ FPQ taste	0.09	0.27	0.32	0.41

Analysed using Spearman correlation. VLED, very low-energy diet; %TWL, percentage total weight loss; STQ, sweet taste questionnaire; FPQ, fat preference questionnaire.

What does this mean?

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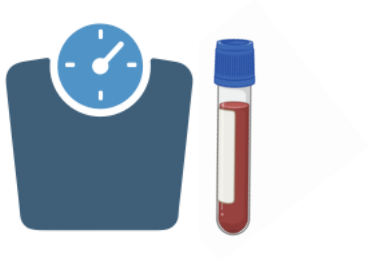

1.

Both **MBS** and **VLED** can produce meaningful weight loss and **metabolic improvements. lower intake of, and preference for, high at foods,** compared to VLED.

2.

MBS results in significantly **reduced preference for high fat foods,** compared to VLED.

No change to sweet preference was found after either intervention.

3.

Changes **in food preference** are **not associated** with **weight loss** after either intervention.

Next steps & future directions

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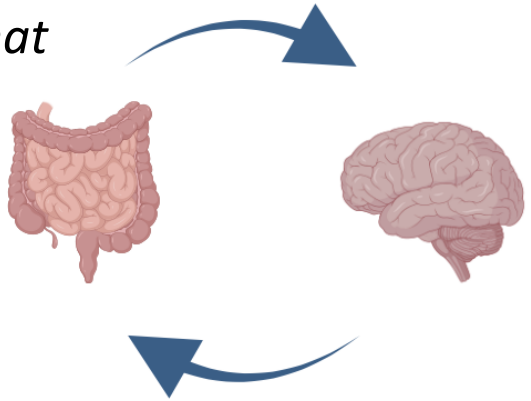
1. **Investigate the association between food preference changes and long-term weight loss maintenance.**
   - *Longitudinal studies comparing food preference changes between patients that maintain weight losses long-term and those that regain the weight.*



2. **Investigate gut-brain mechanisms associated with post-surgical changes in food preference.**
   - *Stomach, duodenal, and jejunal mucosal biopsies obtained at baseline, post-VLED, and 12-months post-surgery.*
   - *Using spatial transcriptomics to map gene expression in enteroendocrine cells and vagal afferent neuronal terminals.*

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Thank you.

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Limitations

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1. **Current sample size**
   - *Unable to analyse sleeve gastrectomy (n=2) and Roux-en-Y gastric bypass (n=8) separately.*

2. **Observational study design**
   - *Prevented standardisation of VLED prescription.*

3. **Sweet Taste Questionnaire**
   - *Does not specifically target 'preference' rather the 'power' of sweet taste.*