Effect of Ramadan Fasting on Weight, Nutritional Status, Lifestyle and Depression Among Bariatric Patients at Selected Government Hospital

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Conflict of Interest of Disclosure

I have no potential conflict of interest to report

Ethical Considerations

This study is approved by the IRB (NMRR/MREC)

Background

- Muslims practice Ramadan fasting where they are refrained from consuming foods and drinks from sunrise until sunset.
- With an average 13 hours of fasting up to 30 days, the nutritional status of bariatric patients becomes a concern

Research Question

Does dietary support during Ramadan fasting affect the nutritional status among bariatric patients?

Primary Objective

To compare nutritional status between adherent and non-adherent bariatric patients during Ramadan fasting.

Secondary Objective

To compare weight, lifestyle, and depression between adherent and non-adherent bariatric patients during Ramadan fasting.

Methodology

Study Design

- Retrospective observational study
- Universal convenience sampling

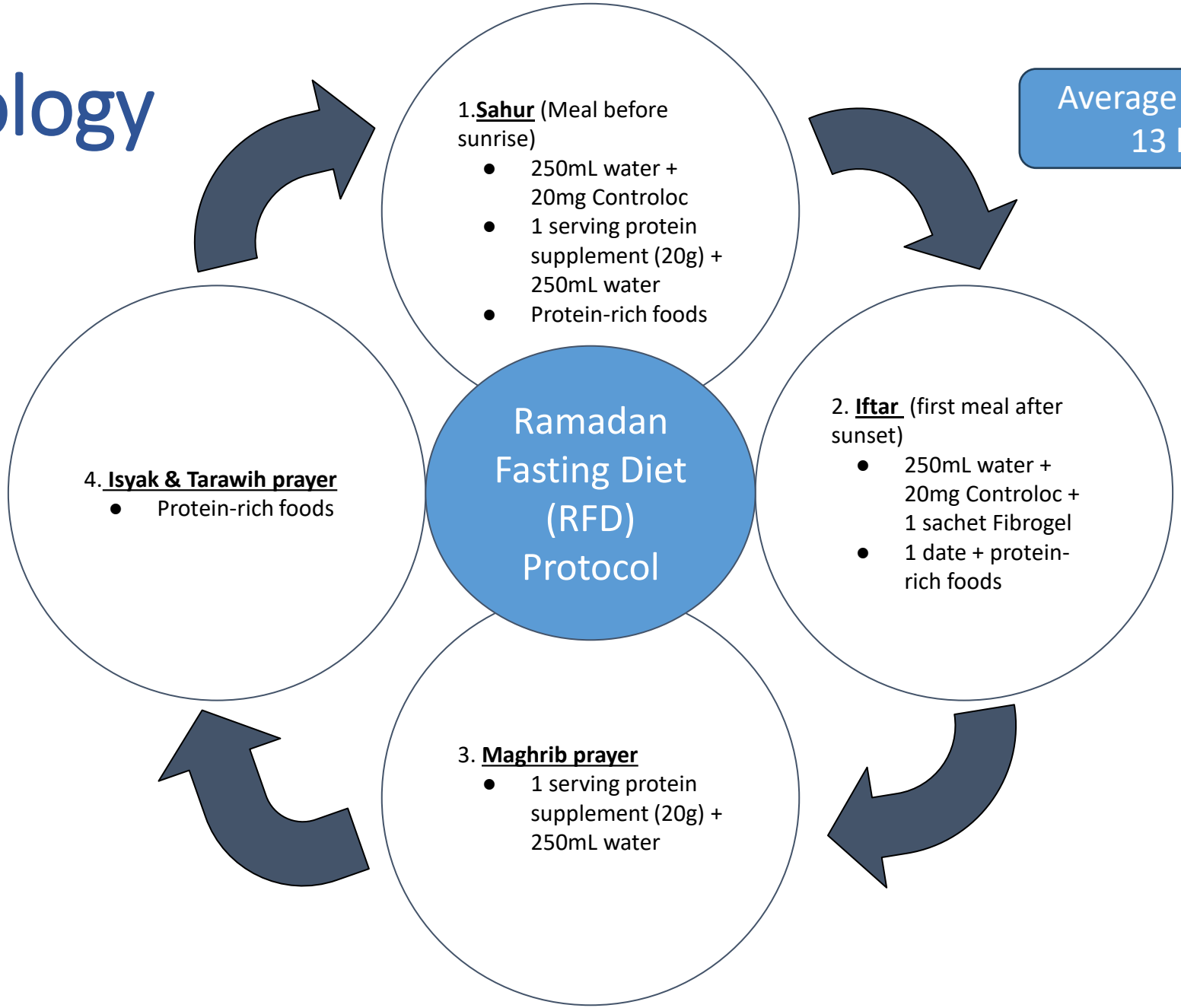
Patients' Recruitment

- Between 18 and 65 years old
- Undergone bariatric surgery
- Able to be fed orally
- Are medically fit to practise Ramadan fasting in 2023 as determined by surgeon

Sample Size

- Total participants: 80
  - Adherence group: 40
  - Non-adherence group: 40
- 60 g protein /day (ASMBS, 2022)
- 1.5 L water/day (ASMBS, 2022)

Methodology



Methodology

No.	Parameters	Pre-Ramadan Fasting (Baseline)	During Fasting Ramadan	Tools used
1.	Data on bariatric surgery	/		Medical records
2.	Sociodemographic data	/		Medical records
3.	Weight	/	/	Anthropometry measures
4.	Medical History	/	/	Medical records
5.	Dietary intake	/	/	3-days dietary recall
6.	Hunger & satiety	/	/	Validated Hunger and Satiety perception with a visual analogue (VAS)
7.	Sleep quality	/	/	Epworth Sleepiness Scale (ESS) questionnaire
8.	Physical activity	/	/	Validated Malay language version of short-form International Physical Activity Level Questionnaire (IPAQ)
9.	Depression	/	/	Validated 9-item Malay language version Patient Health Questionnaire (PHQ-9).

Result

Characteristic of study population (N = 80)

Characteristics	N = 80		
	Adherence group (n = 40)	Non-adherence group (n = 40)	p-value
Gender (%)			
Male (n = 21)	11 (27.5)	10 (25.0)	0.879
Female (n = 59)	29 (72.5)	30 (75.0)	0.911
Age in Years (Mean ± SD)	42.1 ± 9.6	43.0 ± 7.7	0.691
Duration of fasting days (Mean ± SD)	20.3 ± 5.3	19.8 ± 4.8	0.504
Number of months post-operative (Mean ± SD)	12.7 ± 6.1	12.3 ± 5.9	0.271

Characteristics	N = 80		
	Adherence group (n = 40)	Non-adherence group (n = 40)	p-value
Co-morbidities (%)			
Type 2 diabetes mellitus (n = 16)	7 (43.8)	9 (56.3)	0.825
Hypertension (n = 23)	11 (47.8)	12 (52.2)	0.710
Dyslipidemia (n = 41)	18 (43.9)	23 (56.1)	0.324
Type of bariatric surgery (%)			
Sleeve gastrectomy (n = 73)	37 (92.5)	36 (90)	0.504
Roux-En-Y gastric bypass (n = 7)	3 (7.5)	4 (10)	0.937

Result – Primary Outcome (Baseline)

Effect of Dietary Support on Nutritional Intake

	Adherence group (n = 40)	Non-adherence group (n = 40)	P-value
Pre-Ramadan			
Fluid intake in ml/day (Mean ± SD)	1637.3 ± 120.3	1544.6 ± 310.3	0.876
Total energy intake in kcal/day (Mean ± SD)	1334.4 ± 224.0	1312.7 ± 173.7	0.063
Total carbohydrate intake in g/day (Mean ± SD)	52.0 ± 13.1	48 ± 11.9	0.089
Total protein intake in g/day (Mean ± SD)	77.2 ± 16.9	75.1 ± 16.3	0.954
Total fat intake in g/day (Mean ± SD)	42.1 ± 8.7	38.9 ± 5.4	0.370

Result – Primary Outcome

Effect of Dietary Support on Nutritional Intake

	Adherence group (n = 40)	Non-adherence group (n = 40)	P-value
During Ramadan			
Fluid intake in ml/day (Mean ± SD)	1787.9 ± 212.1	1032.9 ± 273.4	**<0.001**
Total energy intake in kcal/day (Mean ± SD)	1211.9 ± 307.3	1339.3 ± 381.2	**<0.001**
Total carbohydrate intake in g/day (Mean ± SD)	49.0 ± 10.8	52.3 ± 18.9	**<0.001**
Total protein intake in g/day (Mean ± SD)	72.9 ± 10.2	39.6 ± 16.9	**<0.001**
Total fat intake in g/day (Mean ± SD)	45.0 ± 11.3	49.2 ± 6.7	**<0.001**
Having vomiting while fasting (%) (n = 6)	1 (2.5)	5 (12.5)	**<0.001**
Having dyspeptic symptoms while fasting (%) (n = 5)	1 (2.5)	3 (7.5)	**0.021**

Result – Secondary Outcomes

Effect of Dietary Support on Weight

	Adherence group (n = 40)	Non-adherence group (n = 40)	P-value
Pre-Ramadan (Baseline)			
Weight in kg (Mean ± SD)	107.1 ± 23.8	104.8 ± 34.9	0.703
Body mass index in kg/m² (Mean ± SD)	40.1 ± 6.3	41.7 ± 5.9	0.832
During Ramadan			
Weight in kg (Mean ± SD)	105.3 ± 22.6	103.1 ± 28.5	0.089
Body mass index in kg/m² (Mean ± SD)	39.6 ± 5.8	39.1 ± 7.9	0.134

Result – Secondary Outcomes

Effect of Dietary Support on Weight

	N = 80
Weight changes pre- and during Ramadan (%)	
Reduced weight (n = 44)	55.0
Did not change weight (n = 24)	30.0
Increased weight (n = 12)	15.0

Result – Secondary Outcome (Baseline)

Effect of Dietary Support on Hunger and Satiety

	Adherence group (n = 40)	Non-adherence group (n = 40)	P-value
Pre-Ramadan	How hungry do you feel? (Mean ± SD)		
Right before breakfast	3.1 ± 0.8	3.2 ± 1.3	0.749
Mid-day 12 pm	6.5 ± 1.2	6.9 ± 0.9	0.077
Right before dinner	6.9 ± 1.6	7.4 ± 1.3	0.061
Right before bedtime	2.4 ± 0.5	2.1 ± 1.1	0.068

Result – Secondary Outcome

Effect of Dietary Support on Hunger and Satiety

	Adherence group (n = 40)	Non-adherence group (n = 40)	P-value
During Ramadan	How hungry do you feel? (Mean ± SD)		
Right before Sahoor	2.1 ± 0.8	2.0 ± 1.3	0.563
Mid-day 12 pm	3.4 ± 1.6	4.3 ± 2.1	0.064
Right before Iftar	5.1 ± 2.3	5.9 ± 1.8	0.060
Right before bedtime	1.2 ± 0.9	1.1 ± 0.1	0.793

Result – Secondary Outcome

Effect of Dietary Support on Hunger and Satiety

	Adherence group (n = 40)	Non-adherence group (n = 40)	P-value
Pre-Ramadan (Baseline)	How full do you feel? (Mean ± SD)		
2 Hours after Breakfast	6.7 ± 1.2	6.8 ± 0.6	0.347
2 Hours after Dinner	7.9 ± 0.3	8.0 ± 0.1	0.711
During Ramadan	How full do you feel? (Mean ± SD)		
2 Hours after Sahoor	8.2 ± 1.3	7.9 ± 3.4	0.669
2 Hours after Iftar	7.2 ± 0.3	7.1 ± 1.8	0.713

Result – Secondary Outcomes (Baseline)

Effect of Dietary Support on Lifestyle

	Adherence group (n = 40)	Non-adherence group (n = 40)	P-value
Pre-Ramadan			
Epworth Sleepiness Scale (Mean ± SD)	2.1 ± 0.5	2.3 ± 1.2	0.097
Total hours of sleep/day (Mean ± SD)	7.1 ± 0.3	7.0 ± 0.9	0.140
Total walking in min/week (Mean ± SD)	359.7 ± 123.3	344 ± 137.1	0.101
Total moderate activity in min/week (Mean ± SD)	231.2 ± 80.2	228.3 ± 103.6	0.708
Total vigorous activity in min/week (Mean ± SD)	104.8 ± 23.7	98.9 ± 50.3	0.076

Result – Secondary Outcomes

Effect of Dietary Support on Lifestyle

	Adherence group (n = 40)	Non-adherence group (n = 40)	P-value
During Ramadan			
Epworth Sleepiness Scale (Mean ± SD)	2.8 ± 0.6	3.0 ± 0.5	0.852
Total hours of sleep/day (Mean ± SD)	6.9 ± 0.7	6.5 ± 1.6	0.640
Total walking in min/week (Mean ± SD)	298.6 ± 240.3	272.9 ± 205.1	0.734
Total moderate activity in min/week (Mean ± SD)	226.8 ± 190.8	215.8 ± 157.7	0.691
Total vigorous activity in min/week (Mean ± SD)	83.4 ± 41.9	75.4 ± 38.1	0.557

Result – Secondary Outcomes

Effect of Dietary Support on Depression

	Adherence group (n = 40)	Non-adherence group (n = 40)	P-value
Pre-Ramadan (Baseline)			
PHQ – 9 (Mean ± SD)	2.2 ± 0.4	2.1 ± 0.2	0.782
During Ramadan			
PHQ – 9 (Mean ± SD)	2.3 ± 0.4	2.3 ± 0.8	0.089

Discussion

1. Poor nutritional status was found among non-adherent group
2. There were no differences in weight between the two groups
3. Non-adherent group experienced a higher hunger score during mid-day and before Iftar

Conclusion

1. The nutritional status among Malaysian bariatric patients practising Ramadan fasting was adequate while the Ramadan fasting diet protocol is adhered

2. The physical activity level, sleep quality, total sleep time, hunger and satiety perception and depressive symptoms were not significantly affected pre- and post-Ramadan fasting.

Limitation

- Small sample size. Suggest a prospective observational study with a larger sample size
- Short study period. Suggest long term follow-up after Ramadan fasting to observe the possibility of weight regain
- Self-report dietary intake. Underestimating total calories intake

Strength

- Sample size was able to represent the general Malaysian population
- The results has demonstrated the importance of Ramadan fasting diet protocol

Thank you