Identifying Nutritional Risk Among Pregnant Women with Hyperemesis Gravidarum

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Introduction

- Nutritional intakes can be drastically reduced or altered in those with hyperemesis gravidarum (HG), with potential adverse perinatal outcomes[1].
- Nutritional screening tools are commonly used to identify service users at risk of malnutrition and guide dietetic referral pathways[2].
- No studies to date have evaluated the use of nutritional screening tools in populations with HG specifically.
- Aims:
  - To screen for nutritional risk in a population with HG.
  - To evaluate the effectiveness of nutritional screening tools in identifying those at greatest risk of malnutrition.

Methods

Study design and data collection

Medical chart review

Retrospective, cross-sectional review of medical charts of participants receiving care for HG at the National Maternity Hospital (NMH) in Dublin (n = 198).

Data collected on demographic characteristics, medical/obstetric/HG history, and anthropometry.

Food diaries

Completed by a subset of participants (n = 74) who attended a specialised HG day-clinic (IRIS clinic) at the NMH at two time points:

— 1st presentation at IRIS clinic

— 6 to 8 weeks later

Nutritional screening (n = 198)

	Nutritional Screening Tools		
	Malnutrition Universal Screening Tool[3] (MUST)	**Pregnancy adapted MUST[3] (MUST-Pregnancy)**	**Obstetric Nutritional Risk Screening tool[4] (Obstetric-NRS)**
Criteria	• BMI • Weight loss • Acute illness + no nutritional intakes[1]	• Pre-pregnancy BMI • Weight change • Acute illness + no nutritional intakes[1]	• BMI • Weight loss • Disease severity • Nutritional intakes
Risk Stratification	• Low risk • Medium risk • High risk	• Low risk[2] • Medium risk[2] • High risk[2]	• At risk • Not at risk
Application	• n = 27 at 1st presentation • n = 94 at discharge	• n = 27 at 1st presentation • n = 94 at discharge	• n = 192

[1] Score assigned if Pregnancy-Unique Quantification of Emesis and Nausea (PUQE) score ≥13 (severe)[5]
[2] Modified scoring system created to reflect MUST risk categories given the absence of a points based scoring system in the MUST-pregnancy tool.

Food diary analysis (n = 74)

Energy and protein requirements

- Estimated from European Food Safety Authority trimester-specific requirements[6, 7].

Energy and protein intakes

- Estimated from food diaries using Nutritics software (version 5.82).

Statistical analysis

- IBM SPSS Statistics (version 29) was used for all analyses.
- Normality testing, descriptive statistics, and inferential statistical tests e.g., Chi-square tests, independent samples t-tests were conducted.
- Two-sided p-values of <0.05 were reported as significant.

References

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Acknowledgements

G Shimmons was supported by a 2025 Health Research Board summer scholarship.
This research was part-funded by grants from the Nursing and Midwifery Planning and Development Unit and the Bikkja Trust.

Results

Table 1. Characteristics of participants in the full cohort versus in the subset that completed food diaries

Variable	Full cohort (n = 198)	Food diary subset (n = 74)
Age (years)	32.43 ± 5.63	32.49 ± 5.32
Body Mass Index (BMI) (kg/m^2)		
1st presentation	26.43 ± 6.16	25.52 ± 4.89
Discharge	27.64 ± 5.89	27.02 ± 5.06
Gestation (weeks)		
1st presentation	9 (8–12)	9 (7–12)
Discharge	18 (13-33)	18 (13-32.25)
Parity		
Nulliparous	71 (35.9%)	34 (45.9%)
Uniparous	79 (39.9%)	24 (32.4%)
Multiparous	48 (24.2%)	16 (21.6%)
History of HG	(n = 127)	(n = 40)
Yes	72 (56.7%)	24 (60.0%)
No	17 (13.3%)	5 (12.5%)
N/A[1]	38 (30.0%)	11 (27.5%)

Continuous variables are presented as a mean ± standard deviation if parametric tests were used or as a median (interquartile range) if non-parametric tests were used. Categorical variables are presented as number (%).
[1] No data available for history of HG.

Table 2. Results of nutritional screening (n = 198)

Nutritional screening tool:	MUST 1st presentation (n=27)	MUST discharge (n=94)	MUST-Pregnancy 1st presentation (n=27)	MUST-Pregnancy discharge (n=94)	Obstetric-NRS (n=192)
Malnutrition risk					
Low risk	11 (40.7%)	72 (76.6%)	1 (3.8%)	32 (34%)	—
Medium-high risk[1]	16 (59.3%)	22 (23.4%)	26 (96.2%)	62 (66%)	—
Not at risk	—	—	—	—	159 (82.8%)
At risk	—	—	—	—	33 (17.2%)
P-value		.119		.389	

Data presented as number (%). Fisher's exact test was used to determine p-values.
[1] The MUST and MUST-Pregnancy tools stratify risk using low-, medium- and high-risk groupings. These were recoded into dichotomous variables ("low risk" and "moderate-high risk") to enable comparison with the dichotomous variables used in the Obstetric-NRS tool: "at risk" and "not at risk".

Table 3. Comparison of energy intakes with nutritional risk scores in a subset of the population with food diaries (n=74)

Variable	Nutritional screening tool	Risk stratification	n	Mean ± SD	P - value
Energy intakes (% requirements) on admission to IRIS clinic	MUST 1st presentation	Low risk	5	44.57 ± 25.28	
		Medium-high risk	7	45.57 ± 6.16	0.935
	MUST-Pregnancy 1st presentation	Low risk	1	43.77	
		Medium-high risk	11	45.28 ± 16.69	0.932
	Obstetric-NRS	Not at risk	7	53.05 ± 19.01	
		At risk	7	40.58 ± 22.85	0.289
Energy intakes (% requirements) 6-8 weeks later	MUST discharge	Low risk	29	57.77 ± 23.85	
		Medium-high risk	5	53.49 ± 32.74	0.728
	MUST-Pregnancy discharge	Low risk	16	51.56 ± 22.46	
		Medium-high risk	18	62.11 ± 26.33	0.221
	Obstetric-NRS	Not at risk	27	59.31 ± 26.29	
		At risk	10	52.41 ± 22.70	0.468

P-values determined using independent samples t-tests.

No statistically significant associations were observed between energy or intakes and nutritional risk scores for any of the tools at either time point. Similar results were observed with protein intakes.

Conclusion

- These findings suggest that established nutritional screening tools may not be effective at identifying and stratifying nutritional risk in populations with HG. However, small sample sizes may have limited the statistical power of the findings.
- It may be useful to develop a more sensitive, HG-specific screening tool.
  - Consider alternative criteria e.g., mid-upper arm circumference measurements, PUQE score[5].