

Evaluation of Dietitians' Variation in Calculating Calorie and Protein Intake from a Standardised Hospital Menu and Development of a Menu-Based Calculator

Niamh Caulfield, Jack Boland, Rebekah Wilson, Ciara O'Shea, Lisa Gavin



Tallaght
University
Hospital

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An Academic Partner of Trinity College Dublin

Introduction

Accurate assessment of patients' calorie and protein intake is essential for effective nutritional management, impacting recovery and overall health outcomes. Dietitians calculate these values from dietary intake records, often based on information collected by nursing staff. These calculations are used to inform nutritional interventions, monitor progress and guide therapeutic diet planning, especially for vulnerable populations such as surgical, renal, oncology or critically ill patients. However, variability and discrepancies in dietitian calculations of calorie and protein content have been observed, which may arise due to differences in interpretation, calculation methods or data entry errors. Such inconsistencies can lead to inaccurate nutritional assessments, inappropriate dietary recommendations and suboptimal patient care. To address this issue, it is important to audit the current practices and identify the nature and extent of these discrepancies.

Aims and Objectives

- 1) Audit the variability in calorie and protein calculations using dietary intake records derived from the hospital menu
- 2) Develop a calorie and protein calculator tool based off the hospital menu analysis

Methods

Three days of completed dietary intake records were copied from anonymous patient records on the wards. These were distributed to 24 dietitians, who were instructed to estimate daily energy and protein intake as they would on the wards. The results were compared to the actual values derived from the hospital menu analysis.

Results

24 dietitians completed the audit (n = 24). Table 1. below demonstrates wide variations in estimate energy and protein intakes across all three days of dietary intake records compared with the actual values based on the hospital menu analysis.

Table 1. Dietitian Variation in Estimated vs Actual Energy and Protein Intake Across Three Days				
Day	Estimated Energy (kcal)	Actual (kcal)	Energy	Actual Protein (g)
1	1100-2172	1917	48-86	84.7
2	1310-2270	1776	53-94	85
3	890-2205	1580	40-84	61.4

Figure 1. shows the percentage of dietitians who calculated calorie and protein intake within +/- 10% of the actual value. For calorie estimations, this was low on day 1 (16%), increased on day 2 (50%), and remained below half on day 3 (39%). Protein estimates were generally more accurate, on day 1, 42% of dietitians estimated protein within +/- 10%, this increased to 50% on day 2, and remained as 42% on day 3.

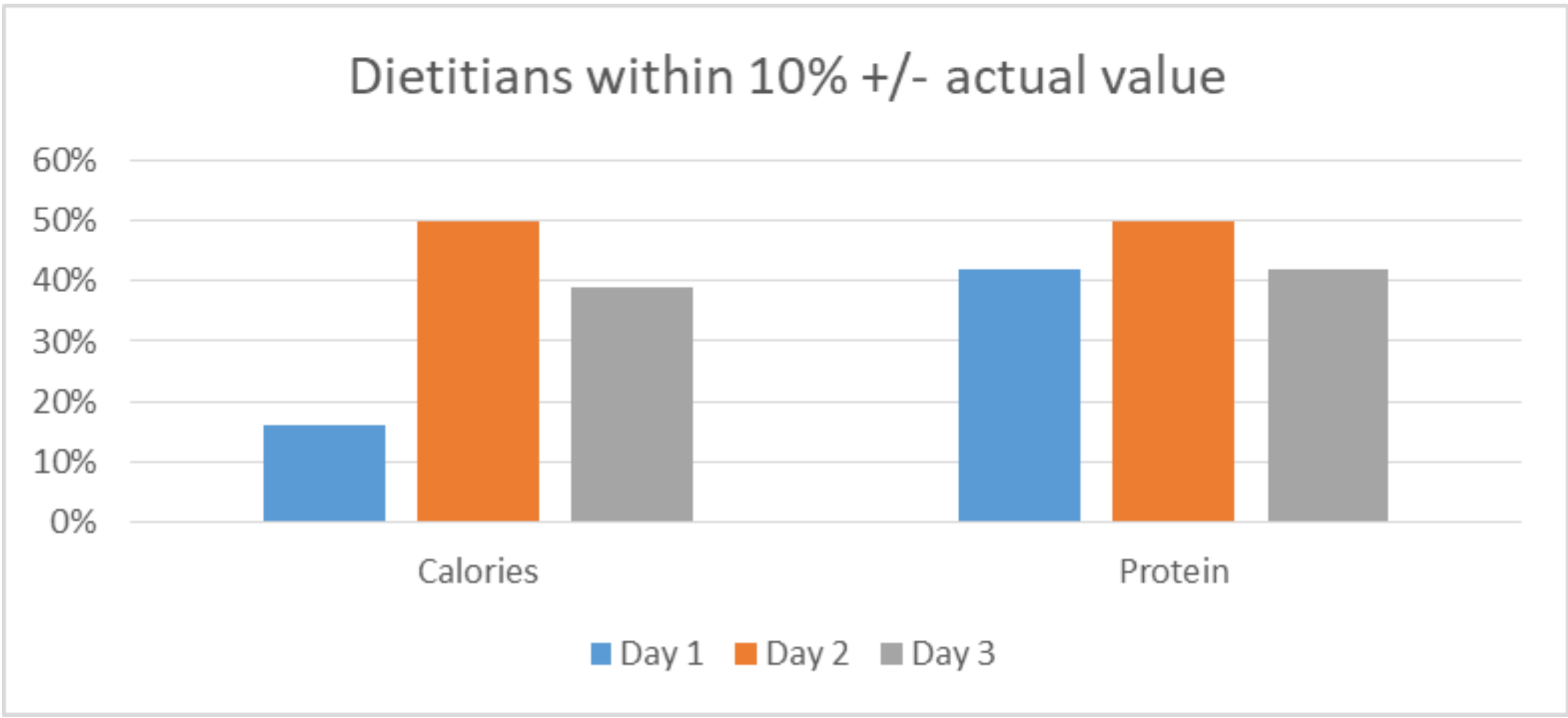


Figure 1. Percentage of dietitians that calculated energy and protein within +/- 10% of the actual values on day 1 (blue), day 2 (orange) and day 3 (grey) of the dietary intake records

ACCURACY OF DIETITIANS' ENERGY (KCAL) ESTIMATES ACROSS A 3-DAY MEAL PLAN

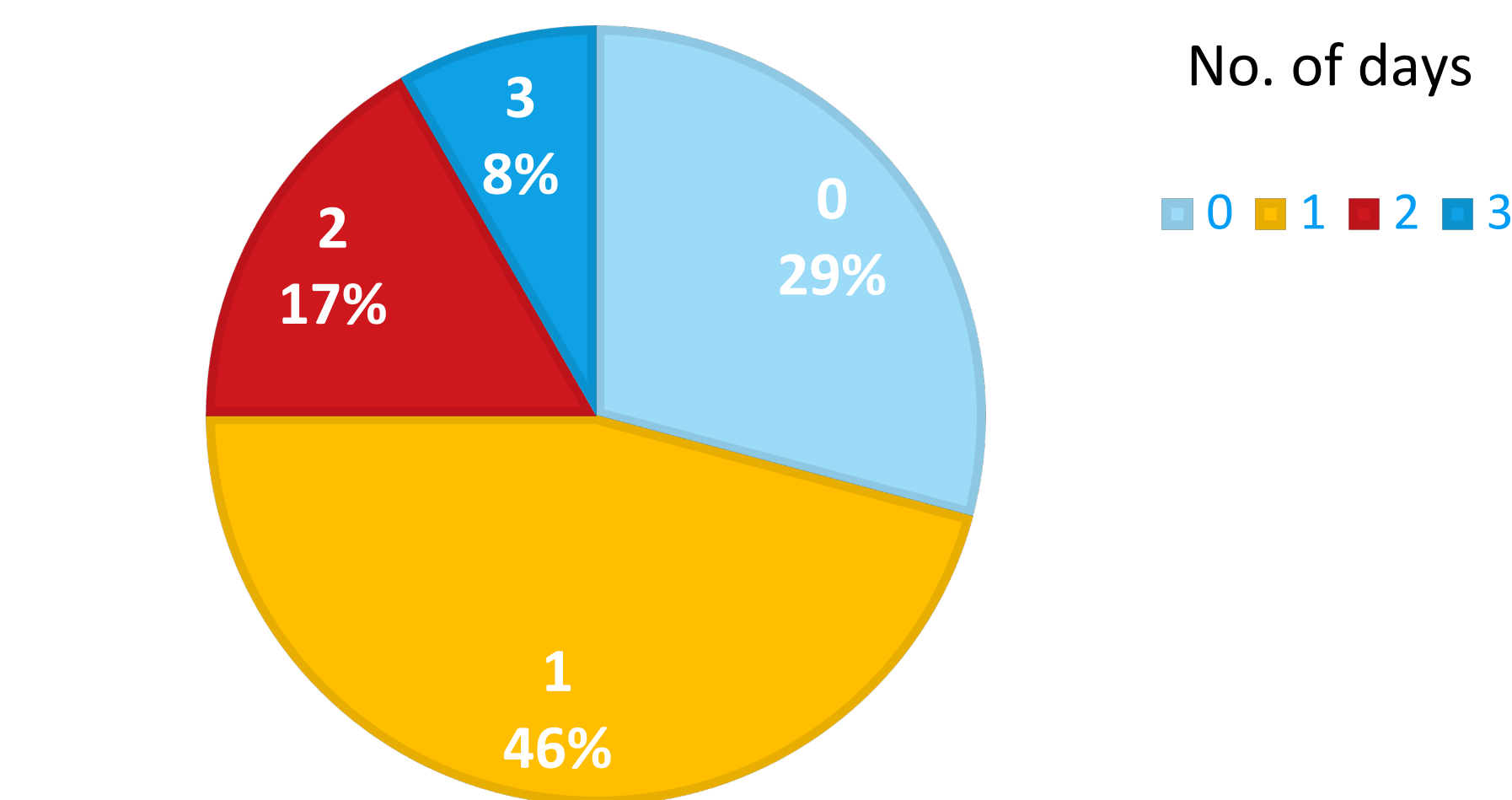


Figure 2. Percentage of dietitians that accurately estimated 0 days (blue), 1 day (yellow), 2 days (red) and 3 days (dark blue) of calorie intake from dietary intake records.

ACCURACY OF DIETITIANS' PROTEIN ESTIMATES ACROSS A 3-DAY MEAL PLAN

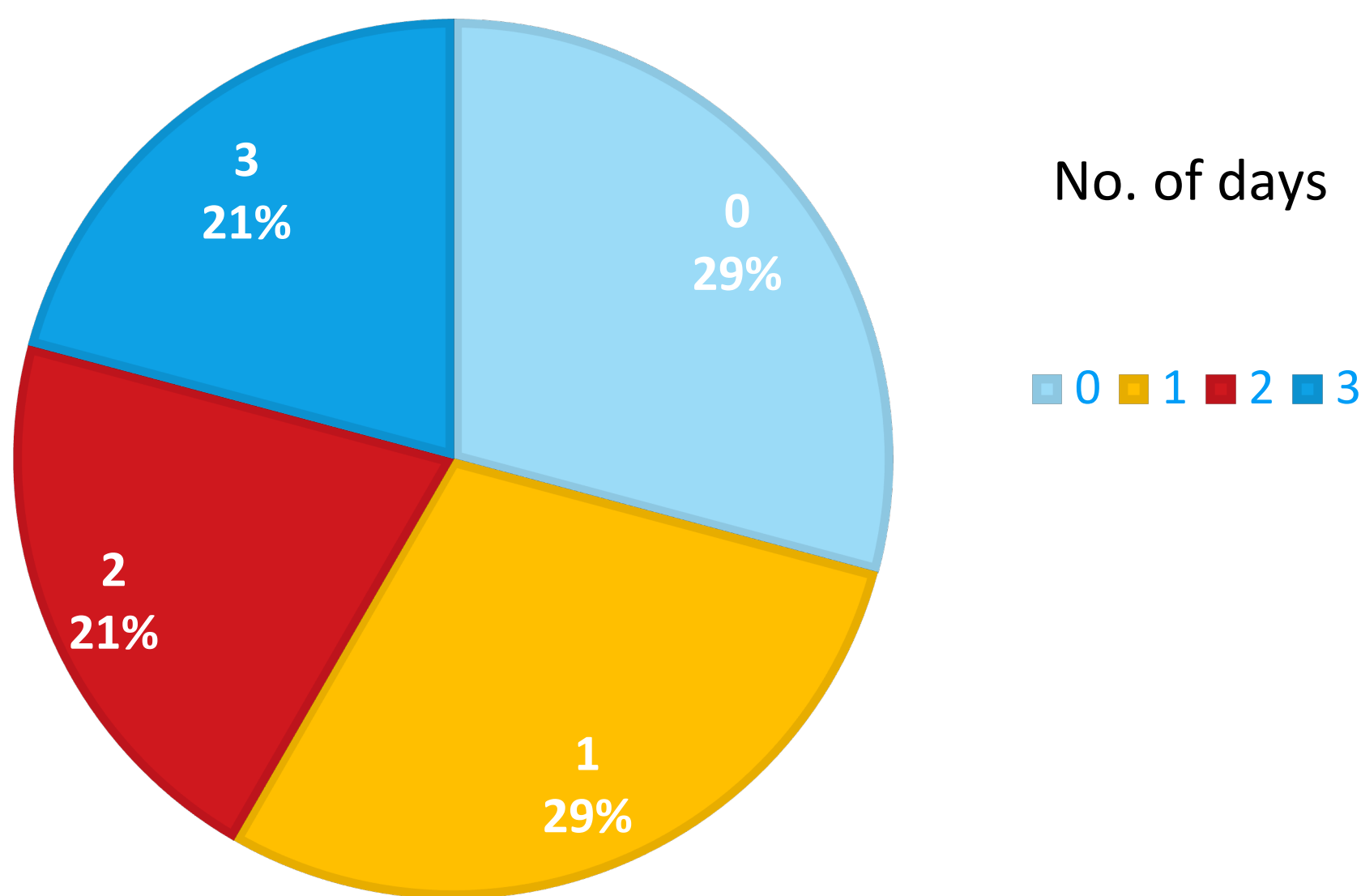


Figure 3. Percentage of dietitians that accurately estimated 0 days (blue), 1 day (yellow), 2 days (red) and 3 days (dark blue) of protein intake from dietary intake records.

When looking at all three days of dietary intake records, 29% of dietitians did not estimate calories or protein correctly (within +/- 10%) on any days. 8% accurately estimated calorie intake (within +/- 10%) on all 3 days while 21% of dietitians accurately estimate protein intake (within +/- 10% of actual value) on all 3 days. See Figure 2. and Figure 3.

Discussion and Conclusion

This study identified measurable variability in calorie and protein calculations performed by dietitians using dietary intake records. The findings suggest that discrepancies were present in both energy and protein estimations. Dietitian calculations both under and over-estimated intake. The calories and protein were underestimated by up to 817kcal and 37g protein, which is more than the nutritional value of two Fortisip Compact Protein supplements. Overestimates ranged up to 625kcal above and 23g protein, that is the equivalent of two Fortisip Comapct Fibre supplements.

A standardised, menu-based calculator was developed to improve consistency and streamline dietetic workflow.



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