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## Nutrient thresholds for categorisation of nutrition dashboard technology could increase sensitivity in identifying malnutrition risk in hospitals

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Malnutrition is a major contributor to poorer health outcomes and continues to be sub-optimally identified and managed<sup>(1)</sup>. The collection and availability of healthcare data is growing rapidly, strategies to harness data for optimal care is evolving<sup>(2)</sup>. A hospital nutrition informatics platform that presents food supply and intake data and categorises risk using energy and protein thresholds has shown potential for identifying malnutrition risk<sup>(3)</sup>. This study aimed to determine the Nutrition Dashboard's capability to predict malnutrition through analysis of multiple energy and protein thresholds. Data were extracted from medical files and food service records for 267 patients over a four-month period, in a 99-bed hospital. Energy (2500 to 8000 kJ) and protein (30 to 90 g) thresholds were applied for Nutrition Dashboard categorisation by supply and intake of food. Deficits in estimated requirements (105 kJ and 0.75 g/kg/day)<sup>(4)</sup> were also applied as a comparative screening method. The association between Nutrition Dashboard categories and Malnutrition Screening Tool (MST) score was explored using generalised estimating equations. A total of 267 patients and 1908 days of data were analysed. Patients at risk of malnutrition (MST  $\geq 2$ ) was 39.2%, of those patients at increased risk, 57% received a dietitian referral. The use of weight based estimated requirements for Nutrition Dashboard categorisation was not statistically significant predictor of MST  $\geq 2$ . Application of energy ( $\leq 6000$  kJ) and protein ( $\leq 65$  g) thresholds for categorisation was significant ( $X^2 = 9.50$ ,  $df = 3$ ,  $p = 0.023$ ). When 5000 kJ and 55 g of protein were used for categorisation, patients were more likely to be at nutritional risk (MST  $\geq 2$ ) if they were within low supply (OR 2.11,  $p = 0.002$ ) and low intake (OR 2.23,  $p < 0.001$ ) categories. When age, length of stay and weight were added to the modelling as covariates, the upper intake and protein thresholds of 5500 kJ and 60 g protein for Nutrition Dashboard categories one (low supply; OR 1.64,  $p = 0.046$ ) and two (low intake; OR 1.64,  $p = 0.041$ ) remained statistically significant predictors of at-risk nutrition status as measured by MST  $\geq 2$ . Age and LOS were not significant predictors of MST  $\geq 2$ , a static weight measure was found to be a predictor of at-risk nutrition screening (OR 0.97, CI = 0.95–0.97,  $p < 0.001$ ). Nutrition Dashboard supply and intake categories were associated with an increased risk of malnutrition when categorised using thresholds up to 6000 kJ and 65 g protein. The Nutrition Dashboard presents nutrition risk surveillance information directly to dietitians with high reliability in an easily accessed, interactive format. Technologies such as the Nutrition Dashboard present innovative opportunities for dietitians to utilise nutrition informatics to enhance and optimise nutrition care.

### References

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