

Project Title

Validation of the 3-Minute Nutrition Screening (3-MinNS) Tool in Surgical Outpatients going for Elective Surgery

Project Lead and Members

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Organisation(s) Involved

National University Hospital

Healthcare Family Group(s) Involved in this Project

Allied Health (Dietetics), Nursing

Applicable Specialty or Discipline

Nutrition and Dietetics, Surgery, Ambulatory Care

Project Period

Start date: September 2017

Completed date: September 2021

Aims

To determine the validity of the 3-Minute Nutrition Screening (3-MinNS) tool in surgical outpatients going for elective surgery.

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Lessons Learnt

1. Regular training and engagement with nurses are important to ensure that nutrition screening is conducted properly.
2. Nutrition screening is only effective if it is followed up by nutrition assessment and intervention

Conclusion

See poster appended/ below

Additional Information

Best Poster Award for National University Cancer Institute International Surgical Oncology Symposium

Singapore Health & Biomedical Congress (SHBC) 2022: Best Poster Award (Allied Health) (Poster category) – (Gold Award)

Project Category

Applied/ Translational Research

Quantitative research

Keywords

Nutrition Screening, Malnutrition, Preoperative Nutrition

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Introduction

- Malnutrition in patients undergoing surgery has been associated with increased length of hospital stay, infectious complications including surgical site infections, and mortality.
- Pre-operative nutrition screening can help to identify at-risk patients for early nutrition intervention to optimize their nutrition status, and reduce the risk for postoperative complications.
- A validated nutrition screening tool is important for accurately identifying at-risk patients for early pre-operative nutrition intervention.

Aim

To determine the validity of the 3-Minute Nutrition Screening (3-MinNS) tool in identifying nutrition risk in surgical outpatients going for elective surgery.

Methods

- Adult patients aged ≥ 21 years and planned for elective surgery, were screened with the 3-MinNS tool by 1 of 4 trained nurses in the surgical outpatient clinic.
- A dietitian blinded to the screening results assessed the patient's nutrition status using the 7-point Subjective Global Assessment tool (7-point SGA) on the same day.
- Descriptive statistics were used to describe the study sample.
- Receiver operating characteristics (ROC) curve and contingency tables were used to determine sensitivity, specificity, and predictive values of the 3-MinNS tool.
- The greatest area under curve (AUC) shows the ideal sensitivity and specificity of the 3-MinNS tool.
- Youden's Index (J) was used to determine the optimal cut-off score of the 3-MinNS tool for identifying nutrition risk in the surgical outpatient setting.

Results

Study Sample	N = 133
Gender, n (%)	
Male	68 (51.1)
Female	65 (48.9)
Age, years (Mean \pm SD)	68.9 \pm 10
Race, n (%)	
Chinese	102 (76.7)
Malay	15 (11.3)
Indian	6 (4.5)
Others	10 (7.5)
Nutrition status, n (%)	
Well nourished	72 (54.1)
Mild to moderately malnourished	61 (45.9)
Reason for surgery, n (%)	
Malignancy	123 (92.5%)
Non-malignancy	10 (7.5%)

Table 1: Characteristics of participants

3-MinNS cut-off score	Sensitivity (%)	Specificity (%)	Youden's Index (J)
1	98.4	38.9	0.37
2	96.7	54.2	0.51
3	90.2 ^a	79.2 ^a	0.69 ^b
4	60.7	94.4	0.55
5	34.4	97.2	0.32
6	14.8	98.6	0.13
7	1.6	100.0	0.02
8	0.0	100.0	0.02
9	0.0	100.0	0.02
AUC		0.901	
<i>p</i> -value		<0.001*	

^aSensitivity and specificity of 3-MinNS in identifying malnutrition at its best cut-off score.

^bMaximum J (Youden's index = sensitivity + specificity - 1) represents best cut-off score

*Significant *p*-value for AUC

Table 2: Sensitivity and Specificity of 3-MinNS at different cut-off values

Results (cont.)

- Of the 133 patients, 51.1% were male and 92.5% were undergoing surgery for malignancy (Table 1).
- They had a mean age of 68.9 \pm 10.0 years (Table 1).
- Using the 7-point SGA, 45.9% of the patients were found to be mild to moderately malnourished (Table 1).
- The 3-MinNS tool has a high sensitivity (90.2%) and moderate specificity (79.2%) (AUC = 0.901, *p* < 0.001), with a positive predictive value of 90.5% and a negative predictive value of 78.6%. The optimal cut-off score to identify patients at risk of malnutrition is 3 (Table 2).

Conclusion

- Patients undergoing elective surgery have a high risk for malnutrition.
- The 3-MinNS tool is a valid nutrition screening tool for adult patients planned for elective surgery.
- Future research may explore the impact of early nutrition intervention on postoperative outcomes.

Acknowledgement

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