Nutrition screening in children – the validation of a new tool
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Background: The early identification and management of under-nutrition has been advocated for many years1. Nutrition risk screening using validated tools is well established as good practice in adult and elderly healthcare2. Currently there is no valid nutrition risk screening tool in the UK for use with children. Nursing staff working with children have a clear role in the identification of those at nutrition risk3, however the lack of a nutrition risk screening tool limits the effectiveness with which nurses can undertake this role.

Aim: To demonstrate the validity of a new nurse administered, paediatric nutrition risk screening tool within an acute hospital.

Methods: Full ethical approval was granted by Salford and Trafford Research Ethics Committee prior to undertaking this study. All children (aged 2-17 years) admitted over a four month period to the study wards (two general medical, two surgical) of a large paediatric centre in Manchester, UK, were screened for nutrition risk on admission using a new nurse administered paediatric nutrition risk screening tool (NST). The NST consisted of three elements: clinical condition, nutritional intake and anthropometric measurements. Each element was scored and children with an overall score of 4 or more were considered at nutrition risk. Of those screened a sample of children were further assessed for nutrition status by a registered dietitian (RD). The full nutrition assessment consisted of a face-to-face interview obtaining dietary and social information and anthropometric measurements. Medical information was retrieved from case notes.

Data were analysed using Chi-Square tests to compare groups and the $\kappa$ statistic to compare agreement in the prevalence of nutrition risk between the screening tool and the full nutrition assessment.

Results: The majority of 238 the participants who underwent a full nutrition assessment by a RD were male (56%), the mean age was 8.4 ± 4.6 years. Medical and surgical admissions were equally represented (51% and 49% respectively). Nutrition risk was identified in 18% of the sample by both the NST (total score of 4 or more), and the full nutrition assessment by the RD. The prevalence of nutrition risk identified was not significantly different between males and females (by either method), but was statistically higher (by both methods) in medical compared to surgical admissions (Figure 1).

Compared to the full nutrition assessment by the RD, the NST demonstrated 70% sensitivity and 91% specificity with a $\kappa$ statistic value of 0.56 (0.40, 0.71) indicating fair to substantial agreement in identifying those at nutrition risk (Table 1).

Table 1 Agreement between full nutrition assessment by a registered dietitian (RD) and the nutrition screening tool (NST) for identification of nutrition risk (NR)

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<tr>
<th></th>
<th>At NR</th>
<th>Not at NR</th>
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<tbody>
<tr>
<td>RD</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td>NST</td>
<td>18</td>
<td>177</td>
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$k = 0.56 (0.40, 0.71)$

Discussion: The NST validated in this study utilises information routinely collected by nursing staff during the admission process, thus minimising the time, training and resource implications of routine use in clinical practice. The NST demonstrated fair to moderate agreement with the identification of nutrition risk from a full nutrition assessment by the RD. This suggests that this new NST would be effective in the early identification of children requiring further detailed nutritional assessment and appropriate interventions.

Conclusion: The results of this validation suggests that this newly developed, nurse administered paediatric NST is valid and reliable for the identification of children at nutrition risk on admission to hospital.

Further investigation of the validity of the NST will focus on nutrition risk by different clinical conditions and clinical settings.

References:
1 Lennard-Jones JE (1992) A positive approach to nutrition as a treatment. London: King’s Fund Centre