Proceedings of the Nutrition Society (2012), **71 (OCE2)**, E207 doi:10.1017/S0029665112002649

Summer Meeting hosted by the Irish Section, 16–19 July 2012, Translational nutrition: integrating research, practice and policy

Identification of malnutrition in hospitalised children within the UK and Ireland

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The implications of malnutrition for growth and clinical outcomes in children are well recognized[1]. In addition, there are long term consequences of malnutrition on foetal, infant and childhood growth which can predispose a child to increased risk of chronic disease in adulthood[2]. Currently it is estimated that between 9 and 47% of hospitalised children are at risk of under-nutrition[3]. Apart from certain disease states known to predispose to under-nutrition, such as cystic fibrosis, cardiology and cancer conditions, these prevalence estimates are highly dependent on the indices used to define under-nutrition[3]. Furthermore, no comparable data are available to estimate the prevalence of over-nutrition in hospitalised children. The aim of this study was to establish the current prevalence of malnutrition in hospitalised children within the UK and Ireland.

The Children's Nutrition Survey was conducted throughout the UK and Ireland in April 2011. Centres were recruited through professional publications and specialist paediatric groups of the British Dietetics Association (BDA) and the Irish Nutrition and Dietetics Institute (INDI). Participating centres recorded routine clinical data for all children admitted over a defined 72-hour period. The proforma used was adapted, with permission, from those used in the BAPEN Adult Nutrition Screening Week 2010.

In total, 22 centres participated in the survey; clinical data were recorded for 932 children (573 boys, 427 girls, mean age 5.7 years). Weight measurements were recorded for 865 (93%) children while height was recorded for only 468 (50%). Data were referenced against UK-WHO growth reference data.

	N	Under-weight* N (%)	Acceptable† N (%)	Over-weight‡ N (%)
Weight z-scores	865	51 (6)	748 (86)	66 (8)
% weight-for-age	865	179 (21)	346 (40)	322 (37)
Height z-scores	468	37 (8)	399 (85)	32 (7)
% height-for-age	468	35 (7)	395 (84)	37 (8)
BMI z-score	390	7 (2)	334 (52)	49 (13)
% BMI-for-age	390	46 (12)	209 (54)	134 (34)
% weight-for-height§	448	87 (19)	224 (50)	136 (30)

BMI, Body Mass Index, *Classified as a z-score ≤ -2SD or ≤ 90%, †Classified as a z-score -2SD to $+2$SD or 90–110%, ‡Classified as a z-score $\geq +2$SD or ≥ 110%, §Calculated based on Shaw and Lawson (2007).

The results of this study suggest prevalence figures of 2–21% for under-nutrition and 7–37% for over-nutrition for children admitted to hospitals in the UK and Ireland. Of the clinical conditions considered, those with renal, respiratory and gastrointestinal disease were at highest risk of under-nutrition (12–16%). Under-nutrition decreased with age while over-nutrition increased with age (data not shown); however the prevalence estimates for both were highly dependent on the indices used. Although previous single centre studies have attempted to define the prevalence of malnutrition, this is the first multi-centre study to do so and to have considered both over and under-nutrition. Given the known adverse consequences of malnutrition and the potential risk of chronic disease in adulthood, there is a need for further research and expert clinical consensus to establish the most appropriate indices by which to define both over and under-nutrition in children.

Ms. Christine Russell for her help and support in obtaining permission for the use of BAPEN's nutrition screening proformas.

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2. Hankey GJ (2011) *Lancet Neurol* **11**, 66–81.
3. Puntis J (2010) *JPGN* **51**, S125–S126.