The role of a hospital Nutrition Support Team

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Abstract

Nutrition and health are so interrelated that each has a bearing on the other. Malnutrition and undernutrition make children more vulnerable to infections and chronic illness. Similarly chronic illness can affect nutritional wellbeing adversely. The prevalence of malnutrition amongst children in hospital in the developed world is between 15 and 30%. Early Nutrition Support Team involvement and intervention can prevent and/or treat malnutrition by choosing appropriate nutritional interventions and help in early identification and prevention of central line infections. In addition they facilitate the appropriate initiation of parenteral nutrition and avoid unnecessary episodes of parenteral nutrition. Staff education is also a key role. This review explores malnutrition, the role of a paediatric Nutrition Support Team in hospital along with its clinical and financial benefits.

Keywords malnutrition; malnutrition screening tool; nutrition; Nutrition Support Team; STAMP; undernutrition

Poor nutrition can be defined simply as the imbalance between the provision and requirement of energy, protein and micronutrients including vitamins, minerals and trace elements, which cause measurable adverse effects on physiological functions and clinical outcome. It is a spectrum with protein energy malnutrition at one end and obesity related issues at the other. Over the past two decades the prevalence of malnutrition amongst children in hospital, has stayed the same across the developed world, between 15 and 30%, depending on the criteria used to determine malnutrition and the study patients' characteristics. Currently around 16.8% of boys and 15.2% of girls between 2 and 15 years age are classified as obese in UK from 2008 data. Nutritional problems are still of major importance in today's developed society.

The frequency of nutritional deficits in the developing world has improved but still remains a huge challenge. Latest WHO data state that the percentage of underweight children under 5 years has dropped from 25% in 1990 to 18% in 2005 and 16% in 2010. However, globally 104 million children are still undernourished, of which 20 million suffer from severe acute malnutrition. Stunting in children less than 5 years age has decreased globally from 40% to 27% during the same period. World Health Statistics estimates that 186 million children under 5 years old are still left affected by stunted growth in 2005. Strikingly, over one-third of all child deaths are linked to malnutrition.

Malnutrition can be caused by inadequate/suboptimal nutrition or a disease process. Clinical malnutrition adversely affects outcome and has serious implications for recovery from disease, trauma and surgery. Morbidity and mortality due to disease, both acute and chronic, in children with background malnutrition is higher, an effect that is seen graphically in the developing world. Suboptimal nutrition leads to increased rates of infection, impaired growth, with delayed development and brain function. The Barker hypothesis recognizes the lifelong importance of nutritional programming in early life. Children born with intrauterine growth retardation and low weight at 1 year age have long-lasting consequences due to adverse nutritional programming of different organs and systems, leading to early diabetes, hypertension, and heart attacks in adult life. Boys who are small at birth but catch up by 1 year age are at lesser risk of long-term consequences compared to those who do not catch up. Interestingly, weight at 1 year age in girls had less or no such influence on long-term consequences in some studies.

Poor nutrition is not only a consequence of many diseases, but also is a common feature of chronic illness, major surgery and poor oral intake or absorption. The skills required for assessment, prescription, administration and monitoring of treatment increasingly fall outside the expertise of single practitioner. Thus there is a need for multidisciplinary Nutrition Support Teams in hospitals, especially paediatric patients. Such teams require experts with complementary skills.

Specialists in paediatric Nutrition Support Team and their roles

Paediatrician
- Knowledgeable in nutrition related issues and their effect on disease processes
- In units with high intensity surgical procedures a surgeon should be involved

Nurse specialists
- Training and education of the hospital staff in care of gastrostomies & central venous lines.
- Recognizing side effects and complications of stomas/central lines
- Training families for home nutrition

Dietitians
- Evaluation of nutritional requirements for both enteral and parenteral nutrition
- Knowledge of nutritional supplements
- Training families for home enteral nutrition

Pharmacist
- Preparing parenteral nutrition
- Advice on drug interactions/safety and interaction of parenteral nutrition
- Advice on storage and compatibility with other medical products

Paediatric surgeon/radiologist
- Insertion of central venous lines, gastrostomies where needed
- Post surgical care and management skills

Speech and language therapist
- Advice on desensitization, and the safety of oral feeding and swallowing.

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Costs of undernutrition

In addition to the medical consequences of undernutrition, there is huge financial burden at the national level. In a recent estimate, the cost of adult undernutrition was estimated at £7.3 billion annually in the UK; but the potential cost of undernutrition in children has yet to be determined.

Screening tools for malnutrition

Current practice in assessing nutritional status relies largely on clinical judgement and anthropometric data. Unfortunately clinical assessment alone is inadequate in accurately assessing nutritional status in children. Only 36% of the clinical assessments done by an experienced medical, nursing and dietetic panel were consistent with anthropometric data, with assessors uniformly poor in identifying severe malnutrition and classifying infants to appropriate group. Simple weight and height recordings may not be sufficient as growth rates and proportions vary at different ages. A variety of different paediatric screening tools have been developed. These include, Paediatric Yorkhill Malnutrition Score [PYMS], Paediatric Subjective Global Nutritional Assessment [SGNA], Screening Tool for Assessment of Malnutrition in Paediatrics [STAMP]. There exists still a lack of a universally easy to use, reliable screening tool for children.

Children who are at risk of becoming malnourished or who are malnourished at admission are often suboptimally managed due to inadequate recognition and a lack of nutritional awareness/assessment combined with a poor basic knowledge about artificial nutritional support among medical and nursing teams.

Anthropometry

In the 1950s Gomez described nutritional status among hospitalized children with inadequate food availability in Mexico and classified malnutrition into three groups [based on percentage weight-for-age], those in the most malnourished group [weight-for-age less than 60%] were most likely to die of infections. Two decades later, Waterlow described a new classification based on height/length criteria that has been adopted by WHO as a universal definition of malnutrition allowing meaningful comparisons. Waterlow used percentage expected weight-for-height and height-for-age that are indicative of acute and chronic malnutrition respectively.

Based on definitions by Waterlow, acute malnutrition is classified as mild if weight-for-height is between 80 and 89% of expected value [expected value equates to 50th centile], moderate if between 70 and 79% and severe if less than 70%. Likewise, chronic malnutrition is classified as mild if height-for-age is between 87.5 and 95%, moderate if between 80 and 87.4%, and severe malnutrition if less than 80%.

Following the recently revised child growth standards, the WHO has reviewed the criteria to diagnose severe acute malnutrition in 2006, for children between 6 months and 60 months, as weight-for-height less than 3 SD reference, presence of clinical oedema and mid arm circumference [MAC] less than 115 mm [previously 110 mm]. These new standards have been endorsed by international bodies and adopted by more than 90 countries worldwide.

Rationale for screening tool

The earliest sign of malnutrition in children is absence of weight gain, followed by weightloss; signifying acute effects of malnutrition. Later in the course, it leads to height stunting, signifying chronic malnutrition. Malnutrition either in the background or due to illness will have an adverse effect on recovery and duration of stay in hospital. Children with chronic illnesses such as intestinal failure, inflammatory bowel disease, and cystic fibrosis have a background burden that will be exacerbated by intercurrent illness or acute flare-ups that prolong their recovery.

Which screening tool?

There is no single screening tool that is universally accepted that can be used to identify hospital malnutrition at or soon after admission. In adults, amongst the many tools that are available, "MUST – Malnutrition Universal Screening Tool", has been approved by European Society of Parenteral and Enteral Nutrition (ESPEN) and is recommended by the British Association of Parenteral and Enteral Nutrition (BAPEN).

Manchester children's Hospitals have developed and validated a screening tool STAMP – Screening Tool for Assessment of Malnutrition in Paediatrics for children between 2 and 16 years, that is nurse administered and fulfils the criteria of a good screening tool; i.e., quick, easy to use and interpret, reliable and reproducible. To use this tool, frontline teams need some training so that all staff using the tool do so uniformly, making it reproducible and reliable. As nursing staff are the first to come in contact to children and families, it is practical and reasonable to empower them to screen for nutritional imbalances and follow the pathway developed locally or adopted regionally to initiate the cascade. STAMP has five steps; with steps 1–3 including elements that cover the background clinical condition, dietary intake by children and finally anthropometric data. All of these are scored and combined to give a nutritional risk score at Step 4. Step 5 guides through a care plan and the appropriate pathways for support.

There are some limitations of STAMP: some of the terms used in screening tool are vague, highlighting need for appropriate training and good communication with regular updates and clinical governance activities (Figure 1).

Gaps with existing care

The National Confidential Enquiry into Patient Outcome and Death [NCEPOD][a] reviewed patients who received parenteral nutrition (PN) anytime during a 3-month period in 2008 in the UK, by sending a questionnaire to the lead clinician. A copy of

[a] **Glossary of abbreviations**: BAPEN, British Association of Parenteral and Enteral Nutrition; ESPEN, European Society of Parenteral and Enteral Nutrition; MUST, Malnutrition Universal Screening Tool; ESPGHAN, European Society of Paediatric Gastroenterology, Hepatology and Nutrition Review; NST, Nutritional Support Team; NCEPOD, National Confidential Enquiry into Patient Outcome and Death; PN, Parenteral Nutrition; STAMP, Screening Tool for Assessment of Malnutrition; MAC, Mid Arm Circumference; PYMS, Paediatric Yorkhill Malnutrition Score; SGNA, Subjective Global Nutritional Assessment.