

Dietitians' Attitudes and Experiences of Blended Tube Feeding in Paediatrics

K. O'Sullivan^{1,2}, M. O'Sullivan³, S. Quigley⁴, A. Delahunt⁵, S. Sugrue¹

1. School of Biological and Health Sciences, Technological University Dublin, City Campus, Kevin Street, Dublin 8, Ireland
2. School of Medicine, Trinity College Dublin, The University of Dublin, Ireland
3. Central Remedial Clinic Waterford, Dunmore Road, Waterford, Ireland
4. Community Nutrition & Dietetic Service, Health Service Executive, Community Health Organisation 2, Ireland
5. Tallaght University Hospital Dublin, Ireland

Abstract

Aims

To examine; (a) the number of registered dietitians (RDs) with blended tube fed (BTF) patients, work setting and caseload; (b) attitudes and experiences towards BTF; (c) current BTF supports and future resources required.

Methods

An online survey collected information from Irish RDs over one month. Data was examined using cross-tabulations and Mann-Whitney U tests. Free-text was categorized into thematic domains.

Results

A significant number of RDs with HEN paediatric patients concurrently managed BTF patients ($n = 27/48$, 56.3%, $p < 0.05$). The majority were based in tertiary hospitals (HEN; $n = 20/48$, 41.7%, BTF; $n = 12/27$, 44.4%). Equal numbers were willing to support BTF or on a patient-case basis ($n = 36/77$, 46.8%). International guidelines were most used to inform RDs ($n = 40/69$, 58.0%). Professional training workshops were the preferred learning method ($n = 60/73$, 82.2%).

Conclusion

Overall, BTF appears to be a growing practice. Community services, professional guidelines, training and information are needed.

Introduction

Blended tube feeding (BTF) is defined as the provision of puréed foods administered via a gastrostomy tube and has emerged as part of the home enteral nutrition (HEN) spectrum in recent years¹. In Ireland, due to the absence of a national HEN register, the true prevalence of both this feeding practice and BTF use among those patients receiving enteral nutrition remains relatively unknown. However, rates of HEN activity are increasing annually nationwide and at an international level²⁻⁴ and are most commonly reported among paediatric patients with neurodisabilities e.g. cerebral palsy, chromosomal and metabolic disorders⁵.

While the majority of tube fed children use commercial formula (CF), the use of BTF has increasingly been considered as a viable alternative by registered dietitians (RDs), parents and caregivers ⁶⁻⁹. International recommendations generally do not advocate BTF use ^{10,11-16} and national dietetic regulatory bodies including the Irish Nutrition & Dietetic Institute (INDI) and the Irish Society for Clinical Nutrition & Metabolism (IrSPEN) have not issued any guidance for RDs pertaining to this area of dietetics. In the UK, the British Dietetic Association (BDA) released a policy statement which endorsed only licensed, sterile formulae ¹⁷. However, the onus on the RD to provide tailored advice so that an informed decision on feeding can be made by patients and their carers was also acknowledged and subsequently the BDA Practice Toolkit ¹⁸ was developed. The emergence of professional documents and local policies regarding BTF use have provided RDs with limited guidance ^{19,20}. Furthermore, the American Society for Enteral and Parenteral Nutrition (ASPEN) Standards for Nutrition Support (endorsed by the Academy of Nutrition and Dietetics (AND) formerly the American Dietetic Association (ADA)) provided expert consensus on BTF ²¹ and this acknowledgement suggests that it is a growing practice but one which requires judicious use. The popularity of BTF in the US and Canada may reflect funding mechanisms, where reimbursement for enteral feed costs may not be included by health insurance providers. In addition, psychosocial factors may also motivate families including the opportunity to use whole foods in blends and inclusion in family meals ^{6,22}.

Appropriate patient selection, with due consideration of the risks associated with BTF is a key issue for RDs and the multidisciplinary team (MDT) ^{10,22}. It has been suggested that medically stable patients who display appropriate weight and linear gains, tolerance to bolus feeds and a well healed gastrostomy site with no infection may be suitable ^{10,22}. The necessity of a motivated patient and carer is also recognised as important as more consideration, preparation and overall time are required in the provision of this feeding modality ²². Contraindications to BTF include acute illness or immunosuppression, narrow gastrostomy tubes, fluid restrictions, jejunostomy tubes, continuous drip feedings, restrictive diets and food allergies or intolerances ²². Useful resources including a patient algorithm and a readiness questionnaire ²³ have been developed and such screening tools may be of value in practice for the identification of patients who may be deemed appropriate for BTF implementation.

The RD has an integral role in the medical management team required to support patients and is responsible for the calculation of nutritional requirements and ongoing modification of the blended diet ^{21,24}. Routine monitoring of the feed composition is essential to ensure adequate nutrition is delivered in the home setting. Early detection of sub-optimal nutrient intakes allows for rectification and prevention of deficiency. A full blood count including 25-hydroxyvitamin D, selenium, zinc and iron in addition to urine sodium and electrolyte levels ^{24,25} at baseline have been recommended but definitive monitoring protocols are lacking at present. Reports that patients and caregivers may not seek guidance from an RD when commencing a blended diet ⁹ are concerning and there are increased risks to the patient in the absence of professional input. Moreover, among the dietetic community there appears to be a great demand for standardised BTF guidelines, in addition to practical training and resources to enhance clinical knowledge ⁶⁻⁸.

The purpose of this study is to explore the prevalence of BTF use among HEN paediatric patients and to examine the attitudes and experiences of RDs towards this feeding method. Furthermore, the primary resources used by this cohort to manage BTF patients will be investigated, in addition to the establishment of supports required for future practice.

Methods

A fifty-item online survey study was conducted across healthcare settings in the Republic of Ireland (ROI) and Northern Ireland (NI). Dietitians with Health and Social Care Professionals Council (CORU) or the Health and Care Professions Council (HCPC) membership were considered eligible to participate. The survey tool was generated using Survey Monkey© software based on a pre-existing validated research questionnaire ¹⁰. Estimated time for completion was 10-15 minutes. A combination of multiple choice, Likert scale and free-text response style questions were included to collect objective and subjective information. Open-text options were also included where appropriate. A small pilot study was undertaken to assess the validity of the survey using a convenience sample of RDs. The approved version was issued via the INDI and BDA Northern Ireland (NI) databases. Volunteers were required to click on the attached survey link.

Anonymised survey responses were exported to a Microsoft Excel spreadsheet©. Statistical analysis was performed using the Statistics Package for Social Sciences (SPSS)® Software for Windows, Version 24 (IBM Corporation, Armonk, New York). Demographic and attitudinal characteristics of the sample were examined using descriptive statistics and

presented as counts and frequencies. The Mann-Whitney U Test was used to compare the median and interquartile ranges (IQR) between groups in the case of non-normally distributed data. A series of Chi-square tests for independence were conducted and a two sided p value of <0.05 was selected to denote statistical significance. Thematic domains were constructed based on free-text responses. Ethical approval was granted by the Dublin Institute of Technology (DIT) Research Ethics Committee in February 2018. A full disclosure agreement and declaration of consent was obtained prior to participation.

Results

Potential participants were identified through the INDI and the BDA NI ($n \approx 1,170$). Eighty-two dietitians completed the survey with an overall response rate of 7.0%. Among respondents, a greater proportion had paediatric experience than those who did not ($n = 69/82$, 84.1% vs. $n = 13/82$, 15.9%, $p = 0.001$). The geographical distribution of dietitians across Ireland included; $n = 66/82$, 80.5% in the ROI and $n = 16/82$, 19.5% in NI respectively. No statistical significance was found between HEN and BTF status and geographical location ($p > 0.05$ for all). Within the paediatric experienced group ($n = 69$), a large number of participants managed HEN patients ($n = 48/69$, 69.6%). A significant number of those who actively supervised HEN patients also supported BTF patients ($n = 27/48$, 56.3%, $p < 0.05$). There was no association between paediatric experience and HEN use ($p > 0.05$). Of the sixty-nine dietitians with paediatric experience, those with BTF patients ($n = 27$) had greater paediatric experience compared to those who did not (median years = 12, IQR 8-15 vs. median years = 4, IQR 0.2-14, $p = 0.004$).

Table B.1: Distribution of a Cohort of Registered Dietitians with Home Enteral Nutrition and Blended Tube Fed Paediatric Patients across Irish Healthcare Settings.

Healthcare Setting	Dietitians with HEN ^a Patients ($n=48/\%$ Total)	Dietitians with BTF ^b Patients ($n=27/\%$ Total)
Secondary Hospital	9 (18.8)	3 (11.1)
Tertiary Hospital	20 (41.7)	12 (44.4)
Voluntary Body- Section 38 and 39	2 (4.1)	1 (3.7)
Community Care- Disability	5 (10.4)	5 (18.5)
Community Care- Primary	3 (6.3)	1 (3.7)
Private Practice	2 (4.1)	1 (3.7)
Other ^{c,d}	7 (14.6)	4 (14.8)

^a HEN = Home Enteral Nutrition.

^b BTF = Blended Tube Feeding.

^c 'Other' refers to dietitians with HEN patients on their caseload who worked across multiple settings including Secondary Hospital and Community Care Primary ($n = 3$), Community Care Disability and Community Care Primary ($n = 3$) and Tertiary Hospital and Community Care Primary ($n = 1$).

^d 'Other' refers to dietitians with BTF patients on their caseload who worked across multiple settings including Community Care Primary and Community Care Disability ($n = 2$), Secondary Hospital and Community Care Primary ($n = 1$) and Tertiary Hospital and Community Care Primary ($n = 1$).

Forty-eight dietitians reported a total of 1,589 HEN patients on their caseload (median = 15, min-max: 1-450). Of the twenty-seven dietitians who managed BTF patients, a total of 113 patients were on their current caseloads (median = 1, min-max: 1-55). Within the total HEN paediatric population, a considerable number of BTF patients were reported ($n = 113/1589$, 7.1%).

Table B.2: Attitudinal Characteristics of Registered Dietitians towards the Use of Blended Tube Feeding among Paediatric Patients within Irish Healthcare Settings.

Variable	Respondents (n/% Total)
Perception of BTF^a use (n = 77/82 reporting)	
Definitely Recommend ^b	8 (10.4)
Might Recommend ^c	25 (32.5)
No opinion either way	22 (28.6)
Would not recommend	18 (23.4)
Advise against	4 (5.2)
Willingness to Support (n = 77/82 reporting)	
Yes-“I would be willing to support BTF patients”	36 (46.8)
No-“I would not be willing to support BTF patients”	5 (6.5)
Case Dependent-“Depends on the patient”	36 (46.8)
Confidence to Support (n = 77/82 reporting)	
Very-“I would feel confident to support BTF patients”	10 (13.0)
Moderately-“I may or may not feel confident to support BTF patients”	26 (33.8)
Not at all-“I would not feel confident to support BTF patients”	41 (53.2)

^a BTF = Blended Tube Feeding.

^b Definitely Recommend = RDs who would definitely recommend BTF to tube-fed patients.

^c Might Recommend = RDs who may or may not recommend BTF to tube-fed patients.

Table B.3: Current Resources used by Irish Registered Dietitians to Inform Professional Knowledge on Blended Tube Feeding.

Variable	Respondents (n)	Respondents (% Total)
BTF^a Resources Used choose all that apply; (n = 69/82 reporting) ^b		
Textbooks	21	30.4
Journal articles	31	44.9
Online websites	30	43.5
Social media	17	24.6
International guidelines/policy	40	58.0
Colleagues/MDT members	14	20.3
Family/patient case reports	6	8.7
Nutritional analysis software	2	2.9
Perception on BTF Resources (n = 73/82 reporting)		
Adequate	1	1.4
Inadequate	59	80.8
No opinion either way	13	17.8

^a BTF = Blended Tube Feeding.

^b Multiple responses allowed (hence total number of responses was >69 and total % was >100). This represents a total of 69 dietitians.

Table B.4: Requested Resources Required to Support Blended Tube Feeding in Clinical Practice as reported by a Cohort of Irish Registered Dietitians.

Variable	Respondents (n)	Respondents (% Total)
Information Required choose all that apply ^a ; (n = 72/82 reporting)		
Nutritional adequacy	64	88.9
Blend preparation and recipes	69	95.8
Nutritional monitoring guidelines	56	77.8
Risk of tube blockage	61	84.7
Equipment	58	80.6
Adequate storage guidelines	63	87.5
Use outside of home setting	54	75.0
Patient experience	49	68.1
Preferred Learning Method choose all that apply ^b ; (n = 73/82 reporting)		
Printed material	49	67.1
Webinar	47	64.4
Professional training course/workshop	60	82.2

^a Multiple responses allowed (hence the total number of responses was >72 and total % was >100). This represents a total of 72 dietitians.

^b Multiple responses allowed (hence the total number of responses was >73 and total % was >100). This represents a total of 73 dietitians.

Discussion

In the absence of a national HEN register, this study illuminates the prevalence of home enteral tube feeding practices within the Irish paediatric population. Over half of RDs who managed HEN patients also reported BTF patients on their caseloads (n = 27/48, 56.3%, p <0.05). This confirms anecdotal reports that BTF has become an increasingly elected feeding method^{3,5,6}.

The largest cohort of RDs with BTF patients were located in the tertiary hospital and community care disability setting exclusively (n = 12/27, 44.4%; n = 5/27, 18.5%). This illustrates that BTF patients are managed by RDs within both the acute and community services and highlights the gap in community enteral nutrition services as outlined in the current literature². Furthermore, this is the first study to establish the number of BTF patients across Ireland (n = 113/1589, 7.1%).

Most RDs reported that they had not recommended the use of BTF (n = 62/82, 75.6%) in line with present recommendations¹¹⁻¹⁷, while the majority stated that they “might recommend BTF” (n = 25/77, 32.5%) or had “no opinion either way” (n = 22/77, 28.6%). Additionally, almost half of RDs said they would be willing to support a patient if requested or would do so on a patient-case basis (n = 36/77, 46.8%) which demonstrates a consideration of duty of care towards patients but a more reactive than proactive approach. A large proportion (n = 57/77, 74.0%) stated that guidelines would alter their perspective on the use of blends.

Present resources were regarded as “inadequate” by most (n = 59/73, 80.8%) and international guidelines and policy documents were the primary materials used (n = 40/69, 58.0%). The majority said they would like more information on all aspects of BTF as reflected by existing research^{6,7}. Blend preparation and recipes and nutritional inadequacy were of most interest which emphasises the need for RDs to have access to nutritional software⁶. Provision of nutritionally analysed meal plans would promote a shift towards the standardization of BTF use and would permit greater freedom when preparing feeds⁹. The number of dietitians requesting professional training courses and workshops underlines the lack of professional knowledge in this area. Notably, the least sought after resource used to improve professional knowledge was “patient experience”. This suggests that BTF remains a demand-led service

which requires more evidence to support RDs in their role. As HEN training is largely funded and provided by commercial companies in Ireland, national non-commercial funding would be required to provide necessary BTF training and resources.

Of those who managed patients on blends, the main benefits reported were improved feeding tolerance and psychosocial benefits including the opportunity for caregivers to consider, plan and prepare feeds and patient inclusion in family meals. When asked about the perceived benefits of a blended diet, one RD with BTF patients stated *“It [BTF] encourages the social aspect of eating, rather than solely nutritional. Nutrients available in the food-matrix which are not found in commercial formulae may benefit the health of the patient”*. Among RDs who did not have BTF patients on their caseloads, the most frequently described concerns associated with blended diets included inadequate resources to support practice and medicolegal issues. Another participant cited *“training of support staff, use of equipment off-licence and lack of facilities when admitted to an acute setting”* among the primary perceived challenges. Of note, both RDs with or without BTF patients expressed the need for professional support in this area with one RD stating *“If professional bodies were more open to the use of blended diets then I think more dietitians would be open to trialling same”*.

A research strength was the sizeable number of RDs with BTF experience (n = 27/82, 32.9%) which resulted in comparative analysis between those with none. The survey tool was a robust instrument based on a validated questionnaire ⁸, thereby enabling comparison with recent evidence ⁶⁻⁸. Interestingly, a smaller cohort of Irish RDs would not recommend or advise against the use of BTF (n = 18/77, 23.4%; n = 4/77, 5.2%) respectively compared to a Scottish based survey by Armstrong et al., ⁸ which reported that a greater number would not recommend (n = 34/77; 44.2%) or advise against blended diets (n = 11/77, 14.3%). This may reflect that BTF has become more widely accepted in the time interval between both studies. The small sample size and potential response bias from those more favourably disposed towards its use must also be considered. Additional limitations included the cross-sectional design which was subject to self-selection bias. An underestimation of the prevalence of HEN and BTF use was likely due to the short duration of the research period. Exploration of the attitudes and experiences of patients and caregivers towards this type of feeding is greatly required. The efficacy of a practical training course could also be investigated to assess its potential to enhance professional competency in this area.

In conclusion, a number of HEN patients and caregivers are adopting this feeding approach. A national HEN/BTF register would facilitate the development of community enteral nutrition services. Future research to elucidate the risks, benefits and costs associated with this mode of nutrition would serve to inform professional recommendations and resources which constitute safe practice.

Declaration of Conflict of Interest

The authors have read and understood the IMJ policy on declaration of interests and have no competing interests to declare.

Corresponding Author

Ms. Katie O’Sullivan,
Department of Clinical Nutrition & Dietetics,
Cork University Hospital,
Wilton Road,
Cork,
Ireland.
Email: katie.osullivan4@hse.ie

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