Abstract

Background: Evidence-based guidance on choosing Food-Based (FB) strategies, Oral Nutritional Supplements (ONS) or Combined Interventions (COMB) in the management of adult malnutrition is lacking and systematic reviews of their relative efficacy have been discordant. This study aimed to assess comparative use of each approach in the oral nutritional support practice of UK dietitians, and to assess the factors which influence these clinical decisions, as previously unknown.

Methods: A cross-sectional, anonymous, national survey of UK dietitians.

Results: The number of completed responses received was 207 (3% response rate). More dietitians reported using COMB (n=129, 62%) over FB (n=70, 34%) or ONS alone (n=8, 4%) (n=207, $p<0.001$). Intervention choice was associated with clinical setting (n=207, $p<0.001$) where dietitians working in the community reported more frequent use of FB or ONS alone (n=48, 59% FB or ONS alone vs. n=34, 41% COMB) compared with acute dietitians (n=83, 78% COMB vs. n=24, 22% FB or ONS alone). Intervention choice was also associated with clinical speciality (n=207, $p=0.017$), such that specialist nutrition support dietitians reported more frequent use of FB or ONS alone (n=22, 54% FB or ONS alone vs. n=19, 46% COMB) compared with non-specialist (n=17, 45% FB or ONS alone vs. n=21, 55% COMB) and other specialist dietitians (n=39, 30% FB or ONS alone vs. n=89, 70% COMB). In general, the factors reported as having the greatest influence on intervention use were ease of implementation (n=192, 93%), departmental protocols (n=184, 89%), professional management pathways (n=179, 87%) and published research (n=165, 80%). Patient circumstances (n=117, 57% and n=99, 48%) and ease of implementation (n=35, 17% and n=48, 24%) were reported as most influential in the first and second case scenarios respectively.

Conclusions: There are inconsistencies in oral nutrition support practice amongst UK dietitians. A lack of clear, evidence-based guidelines for choosing oral nutrition support approaches is causing dietitians to rely solely on their clinical judgement. Overall, dietitians' opinions favoured FB strategies while their reported clinical practice suggested COMB approaches were used most often. Ideally evidence-based practice should augment clinical judgement, therefore, there remains a need for further research to support this and patient-centred approaches in the management of adult malnutrition.

Introduction

Approximately three million people in the UK are either malnourished or at risk of malnutrition [1, 2], with 93% of these living at home [2, 3]. Adult malnutrition is associated with poorer nutritional, clinical and patient-centred outcomes as well as increased strain on health and social care budgets, much of which results from longer hospital stays and an increased likelihood of readmission [4–7].

National and international clinical guidelines recommend nutritional intervention in the management of adult malnutrition based on evidence of improved nutritional status, quality of life (QOL) and functional outcomes [8–19]. Dietitians are uniquely skilled in providing nutritional support to malnourished patients and employ mainly food-based, oral nutritional supplements, or combined (FB/ONS/COMB) approaches when oral intake is safe and possible. Although clinical guidelines specify when it is appropriate to use oral nutrition support interventions, there remains a lack of evidence-based guidance on which approach (FB/ONS/COMB) to use. Several systematic reviews have sought to determine the relative efficacy of oral nutritional support interventions but studies were heterogeneous and of variable quality with some findings being discordant [20–23] resulting in confusion amongst clinical decision-makers and presenting a challenge to the implementation of evidence-based dietetic practice [24]. In the absence of evidence, other factors, including organisational priorities may be guiding the choice of intervention rather than patient-related considerations.

A lack of evidence-based guidance potentiates inconsistent management of adult malnutrition in clinical settings and the impact on patient care remains unknown. There were previously no data indicating the frequency with which FB/ONS/COMB interventions are used or the factors which influence clinical judgement in choosing amongst them. Discordance in the published literature in this area leaves the relative efficacy of FB/ONS/COMB interventions uncertain. It is conceivable that in practice, clinical decisions around the choice of oral nutrition support intervention may be influenced by an array of factors combined with the individual clinical judgement of the dietitian. Clinical decisions based primarily on clinical judgement and individual professional opinion are potentially highly variable, making it difficult to quantify their clinical effectiveness. Given the high prevalence of malnutrition in adults, and the fact that oral nutritional support is the preferred first-line approach in its clinical management, understanding of current dietetic practice in the use of oral nutritional support interventions and characterisation of the factors which influence clinical judgement during their practical application, was merited. This would give some indication of what dietitians are doing in practice in order to inform future

research into the relative efficacy of FB/ONS/COMB interventions. Clear evidence-based guidance resulting from this could potentially be translated into improvements in patient care. Furthermore, clinical judgment and evidence-based practice could and should be employed in collaboration. Therefore, this study aimed to assess clinical practice when prescribing oral nutritional support amongst UK dietitians, and to examine the factors which influence clinical decisions.

Methods

A cross-sectional, anonymous, online survey of UK dietitians was used. Ethical approval was obtained from the City, University of London's School of Health Sciences Research Ethics Committee.

Survey development

A questionnaire was developed specifically for this study. Face and content validity were established [25] by piloting the survey using both subject experts (n=4) and clinical dietitians (n=3) currently practising in this area of dietetics, nominated by the subject experts. Subject experts were asked to assess the content validity of the questionnaire using a separate content validity assessment form (Appendix S1) based on published recommendations, which required rating of each questionnaire item on 4 x 4-point scales according to its relevance, clarity, simplicity and ambiguity within the questionnaire[25]. Free text space was also provided after each section for qualitative feedback. For each assessment criterion, questionnaire items which scored 4 by a majority of subject experts remained unmodified; those which scored between 1 and 3 were revised as suggested in the free-text feedback and those which scored 1 for "relevance" by a majority of subject experts were removed from the questionnaire altogether. During the content validity assessment phase, the subject experts were asked to nominate one clinically practicing dietitian to be invited to participate in the next phase of the questionnaire, in order to maintain objectivity. Following content validity assessments, the questionnaire was then assessed for face validity and piloted by a small sample of dietitians (n=3) to ensure clarity, comprehension and ease of access prior to national distribution. As clinical dietitians regularly using nutrition support to manage disease-related malnutrition, they were asked to comment on the ease of access, readability, logical flow and time taken to complete the questionnaire. A pilot and face validity assessment form was used (Appendix S2). Any required changes to the survey highlighted during the piloting phase were made prior to national distribution.

The final questionnaire comprised forty-six questions including one consent question, six study eligibility questions and thirty-nine survey questions divided into seven main sections (Appendix S3). Section A comprised questions about professional/career history and current job role. Sections B-D asked about usual dietetic practice and the factors which influence clinical decisions when choosing oral nutrition support interventions in the management of adult patients who are malnourished or at risk of malnutrition. In sections E-F, participants were then asked to work through two short hypothetical scenarios designed to reflect common clinical cases

encountered in dietetic practice. The survey questions included a mixture of closed questions with categorical responses, statements with possible responses measured on a Likert-type scale, ranked order responses measured on a 6-point ordinal rating scale and open-ended questions.

The online survey-based software Smart Survey (Smartline International Ltd, Tewkesbury, Gloucestershire, U.K.) was used for distribution.

Sampling and recruitment

The study population was UK registered dietitians. A convenience sample of dietitians who were active members of the British Dietetic Association (BDA) formed the sampling frame, which covered a broad demographic range and professional practice area. Dietitians were approached via an email invitation distributed by the BDA and a survey link shared via the BDA's social media platforms. A reminder was sent one month later via the BDA's monthly members' E-zine, social media platforms and BDA Specialist groups.

Inclusion criteria comprised dietitians who were registered with the Health & Care Professions Council (HCPC), currently practicing within the UK, and regularly seeing adult patients who were malnourished or at risk of malnutrition requiring oral nutrition support. Exclusion criteria comprised non-practising dietitians, retired dietitians, paediatric dietitians, exclusively academic dietitians, student dietitians and dietitians practicing outside of the UK. All participants were asked to complete a short questionnaire to establish study eligibility as inclusion criteria were self-applied within the survey. Those who met the exclusion criteria were redirected to a 'Thank You' page, whilst those meeting the inclusion criteria were directed to the questionnaire. A Participant Information Sheet (PIS) at the start provided details of the study. The survey remained open for approximately two months from August 2014.

Statistical analysis

Prior to national distribution, possible responses to closed-ended questions were pre-coded for entry and analysis in IBM SPSS Statistics, Version 19 (SPSS, Chicago, Illinois, USA). Responses to open-ended questions were not pre-coded and are not presented in this report. Descriptive statistics were used to describe the overall data set and frequencies for the categorical data [26]. For continuous variables, tests of normality were conducted using the Shapiro-Wilk test. Medians and interquartile ranges were used to describe continuous, non-parametric data [26]. Data from partially completed questionnaires were discarded. For analyses relating to the two case scenarios, where dietitians were unable to make a decision on an oral nutrition support intervention

and stated they would require further information to do so, the data were excluded. For both case scenarios, the sample was too small to reliably investigate any association between country of training, geographical location and choice of oral nutrition support intervention. Data were summarised as counts and percentages and analysed using Chi-Square tests for categorical data, and the non-parametric Spearman Rank correlation, Mann Whitney U test and Kruskal Wallis test where appropriate, all with $p<0.05$ indicating statistical significance. Chi-square tests were considered valid and reported only if the proportion of cells with expected values of less than 5 was below 20%. A multiple regression approach to analysing contingency tables [27] was used to conduct post hoc analyses for the Chi-square tests.

Results

A total of 279 individuals completed or partially completed the survey. Data for 46 individuals who only partially completed the survey were discarded. Of the 233 remaining participants, 228 consented to participate and were directed to complete the survey. Data on five individuals who did not consent and/or did not meet the eligibility criteria were excluded. A total of 207 dietitians successfully completed the survey.

BDA membership at the time of the survey was 7,551 members, including 6486 UK-based, fully practicing members. A total of 6176 emails were sent out, of which 6029 were delivered. Approximately 20% of recipients opened the email and 6% (n=379) clicked on the survey link. A broad estimate of the response rate on the basis of the number of email invitations delivered (n=6029) and number actually commencing the survey (n=279) is 5%. However, as only 207 surveys were fully completed, a more appropriate estimate of the response rate is 3%.

The main characteristics of the survey respondents are summarised in Table 1. A supplementary extended version of this table is available in Appendix S4.

Dietitians' opinions about oral nutrition support practice:

Dietitians' opinions, represented by their level of agreement or disagreement with statements relating to the choice of an oral nutrition support intervention for adult patients who are malnourished or at risk of malnutrition, are summarised in Table 2. Eighty one percent (n = 188) of dietitians surveyed agreed (n=83, 40%) or strongly agreed (n=84, 41%) that a food first approach should be adopted in the management of nutritionally vulnerable patients. Most dietitians (87%, n = 179) mildly disagreed, disagreed or strongly disagreed that ONS should be used as a first-line strategy. There was no clear distinction between responses to the statement that suggested a combined approach should be used first, with 54% (n = 111) of dietitians expressing agreement (mildly agreed, agreed, and strongly agreed) and 46% (n = 96) expressing disagreement (mildly disagreed, disagreed, and strongly disagreed). Overall eighty three percent (n = 171) of dietitians agreed with the statement that current oral nutrition support practice is evidence-based and an overwhelming majority (98%, n= 203) also agreed with the statement that oral nutrition support is largely based on the clinical judgement of the dietitian. Most dietitians (89%, n = 185) disagreed with the statement that ONS are clinically superior to FB approaches whilst nearly all dietitians surveyed (98%, n = 203) agreed that FB strategies may improve outcomes. Furthermore, there was a negative correlation between dietitians' total number of post-qualification years practicing and the opinion that ONS should be used as a first-line strategy (rho=-0.154, n=207, p=0.027) and likewise

a negative correlation between dietitians' total number of post-qualification years practicing and the opinion that FB strategies improve outcomes. (rho=-0.143, n=207, p=0.040).

Modes of patient contact used by dietitians:

Respondents were asked to indicate the healthcare setting in which patients requiring oral nutritional support were most usually seen. The results are summarised in Table 3. Most contact for both first appointment and review appointments took place in the hospital setting, with face-to-face ward visits (or equivalent) or the outpatient clinic setting being reported as the most frequently used mode of contact for both new (48%, n=99 ward and 25%, n=51 outpatient) and review (45%, n=94 ward and 23%, n=48 outpatient) patients requiring oral nutrition support. Both domiciliary visits and telephone consultations were used less frequently for both new patients and those being reviewed (21%, n=43 and 17%, n=34 respectively for domiciliary visits, and 5%, n=10 and 13%, n=27 respectively for telephone consultations).

Types of oral nutrition support interventions most often used:

When asked which type of intervention was used most often in the management of a patient at nutritional risk, 129 (62%) dietitians reported that they use COMB interventions more often than FB alone (n=70, 34%) or ONS alone (n=8, 4%) interventions. Analysis of responses according to work setting showed that dietitians working solely in the primary care setting were more likely ($p<0.001$) to use FB or ONS alone as individual interventions (n=48, 59%) over COMB interventions (n=34, 42%), whereas those based in the acute setting were more likely ($p<0.001$) to use COMB interventions (n=83, 78%) rather than either FB or ONS interventions alone (n=24, 22%) as shown in Figure 1. In fact, of the 48 community dietitians who reported using FB or ONS alone, all reported using FB most often, and none selected ONS as their most frequently used intervention. There was no difference in the reported relative use of COMB interventions (n=19, 46%) versus individual FB or ONS interventions (n=22, 54%) amongst specialist nutrition support dietitians (p=0.062), and non-specialist dietitians (p=0.611). However, dietitians working in other specialities were more likely (p=0.024) to use a COMB intervention (n=89, 70%) over a FB or ONS intervention alone (n=39, 31%). There were no associations between frequency of use of particular interventions (COMB or FB/ONS only) and Agenda for Change (AfC) banding, geographical location, country of training or membership of a BDA specialist group.

Factors influencing practice around oral nutritional support of dietitians:

Dietitians rated the influence of 9 factors potentially related to oral nutritional support practice, as well as suggesting any additional factors. Ratings of the influence of each factor, ranging from no influence to strong influence, are summarised in Table 4. Ease of implementation, departmental protocols, professional management pathways and published research were rated as having the greatest influence (moderate or strong influence) on practice (93%, n=192; 89%, n=184; 87%, n=179 and 80%, n=165 respectively). Cost to the healthcare provider, cost to the patient and 'The Multidisciplinary Team (MDT)' had a "moderate influence" on practice (50%, n=103, 49%, n=101 and 36%, n=75 respectively). Work colleagues mainly exerted a "minor influence" (48%, n=100) on the dietitians surveyed, while the influence of a professional mentor was split between "no influence" (24%, n=50), "minor influence" (34%, n=70) and "moderate influence (36%, n=75). Many dietitians (73%, n=152) did not report an additional influential factor. Some (18%, n=37) did report additional influential factors, given as open-ended responses, which are not presented in this report. Furthermore, there was a positive correlation between the total number of post-qualification years practicing and the influence of published research (rho=0.144, n=207, p=0.039) and a negative correlation between the total number of post-qualification years practicing and the influence of a professional mentor (rho=-0.186, n=207, p-0.007). The number of post-qualification years of practice was also positively correlated with dietitians' confidence in oral nutrition support (rho=0.248, n=207, p<0.001).

Choice of intervention and influences in theoretical case scenario 1 (community-based patient):

The first case-based scenario (see Appendix S1) involved an older male patient with conservatively managed oesophageal and gastro-oesophageal junction adenocarcinoma living alone and referred for poor oral intake (currently only managing 625kcal, 22g protein per day) and clinically significant (9%) weight loss over the preceding 3-month period. Dietitians who responded to this question (196/207) were more likely to recommend a COMB approach (65%, n=128) over a FB (30%, n=58) or ONS (5%, n=10) intervention (p <0.001). The choice of oral nutrition support intervention (COMB or FB/ONS only) was not associated with AfC banding (p=0.854), clinical speciality (p=0.588), work setting (p=0.133), or membership of a BDA specialist group (p=0.874). Of the 207 dietitians surveyed, nearly two-third (57%, n=117) indicated that the greatest influence on their decision was the patient's circumstances, with ease of implementation of the intervention being the second most influential factor (17%, n=35).

Choice of intervention and influences in theoretical case scenario 2 (hospital-based patient):

The second case-based scenario (see Appendix S1) involved a nutritionally vulnerable patient in hospital, who also lived alone at home. In hospital, she was referred for dietetic input due to a

Malnutrition Universal Screening Tool (MUST) score of 2. She had been losing weight gradually but the period over which she had experiencing weight loss was unquantifiable due to poor recall. She was only managing 41% of her estimated nutritional requirements on the ward with large deficits. The patient was discharged from hospital 6 days later and followed up at home. Dietitians who responded to this question (198/207) were more likely to recommend a COMB approach (70%, n=138) over a FB (19%, n=38) or ONS (11%, n=22) intervention ($p < 0.001$). More dietitians selected FB and ONS-based approaches alone in the community patient (FB: 30%, n=58; ONS: 5%, n=10) compared to the hospital-based patient (FB: 19%, n = 38; ONS: 11%, n=22). For the hospital-based patient, dietitians still reported that they would recommend a COMB intervention over FB or ONS alone. There were no associations between choice of oral nutrition support intervention (COMB or FB/ONS only) and AfC banding (p=0.699), clinical speciality (p=0.508), work setting (p=0.699), or membership of a BDA specialist group (p=0.152). A greater proportion of dietitians indicated that they would change the intervention post-discharge, compared with those that would make no change (58%, n=121 and 42%, n=86 respectively, p=0.015). Again, almost half of dietitians (48%, n=99) reported that the greatest influence on the nutritional support intervention chosen for the hospital-based patient was the patient's circumstances and the second most influential factor was also the ease of implementation of the intervention, with 24% of dietitians (n=48) reporting this.

Discussion

This is the first study to examine dietetic practice when prescribing oral nutritional support interventions amongst UK dietitians and the factors which influence decisions. Overall, dietitians' opinions about oral nutrition support practice favoured FB approaches over ONS, however, combined interventions (COMB = FB + ONS) were reported to be used most often in practice, and were also the most popular choice in each case study. Choice of oral nutrition support intervention was associated with work setting and clinical speciality. Dietitians working in community settings and specialist nutritional support dietitians reported more frequent use of FB or ONS interventions alone, compared with acute and non-specialist dietitians, who reported more frequent use of COMB interventions. The most common factors reported to influence choice of intervention in clinical practice were ease of implementation, departmental protocols, professional management pathways, and published research. In the case studies, the factors having most influence on choice of intervention was patient circumstances, followed by ease of implementation. Professional management pathways referred to any published expert consensus statements in relation to the management of malnutrition. Ease of implementation referred mainly to the convenience of a chosen intervention particularly for the dietitian. Patient circumstances referred to the patient's physical, psychological, social, environmental, emotional state. A greater proportion of dietitians indicated that they would alter their choice of intervention for the hospital-based patient upon discharge back into to the community, compared to those who would not, suggesting an influence of setting on practice. Despite the rise in telemedicine in dietetic practice [28, 29], the dietitians surveyed reported that they provided most oral nutrition support via face-to-face consultations. It is also evident that some aspects of oral nutrition support practice, dietitians' opinions, clinical judgements and confidence in such clinical decisions may be influenced by the number of years of clinical experience.

Whilst the National Institute of Clinical Excellence (NICE) specify the indications for oral nutrition support in the management of adult malnutrition in the UK [9], they do not stipulate the type of intervention to be used and under what circumstances. Professional consensus management pathways for adult malnutrition, encourage optimisation of dietary intake with a "food first" approach reserving ONS for situations where FB measures alone have proved to be inadequate in improving oral intake [30], recommendations also echoed by many local departmental policies. However, clinicians are cautioned as FB interventions may not provide nutritionally complete supplementation [30, 31]. Hence there remains controversy about the optimal method of oral nutritional support in managing malnourished patients. There is an underlying assumption in many policies that FB and ONS are able to achieve the same outcomes. The evidence base for the use of

either option has inconsistencies but appears stronger for ONS. In reality, local policies do vary [32] but there is an overall focus on FB approaches, with ONS being seen as an escalation option. The impact of this approach on longer term outcomes such as hospital admissions, number of prescriptions, length of hospital stay has not been studied [33]. Despite this, the results of this study suggest that despite a professional push towards FB strategies, COMB approaches are still preferred amongst clinically practicing dietitians. In a recently published study, despite professional guidelines for energy and protein content of the food available on hospital menus and the appropriate role of ONS and FB interventions within that setting, a recent audit demonstrated that, in practice, these standards were not being met for the majority of patients [34]. The authors suggest that an exploration of the factors which contribute to this disparity could help close the gap in a tailored, patient-centred fashion in addition to a uniquely placed, dedicated food services dietitian [34].

In this study, the reasons why most dietitians in practice prefer a combined intervention approach rather than choosing either intervention alone are not known. Although dietitians cited published research as an important influence on choice of method, the literature in this area tends to focus on FB approaches and ONS as separate entities, whereas in practice dietitians are tending to adopt combined approaches. Although the evidence in this area is inconsistent and sometimes patchy [20–23, 35], there is a significantly greater body of evidence for ONS and although dietitians may perceive that research evidence is important, their practice does not support the fact that it is a key factor. This has also been observed in other areas of dietetic practice. Even in the presence of clear, evidence-based clinical guidelines to support early post-operative oral feeding amongst adult patients in a non-critical state of illness, adherence to those guidelines was poor with frequent delays to post-operative feeding [36]. Although the authors speculated over the contribution of patient-related, clinician-driven, and organisational factors to this lack of adherence, it is clear that the existence of evidence-based guidance has had a minimal effect on habitual clinical practice [36]. Therefore, unsurprisingly, in the absence of clear, specific evidence-based guidance, dietetic practice in oral nutrition support relies predominantly on clinical judgement. Furthermore, the results of this study suggests that evidence-based practice is not a substitute for the clinical skill and judgement of the dietitian. It has been argued that in clinical encounters, the judgement of the clinician is irreplaceable by evidence-based practice, particularly in situations when the clinician must weigh up a complex range of factors in making a clinical decision for a particular patient [37]. Indeed, the two scenarios used in this study presented two patients both with complex circumstances and nutritional dilemmas with some ambiguity about management to assimilate a real-life clinical encounter where the dietitian has to make a clinical judgement. Whilst the evidence-base is important, the dietitian must consider the complex social, environmental, medical

and other influences to provide patients with a dietary recommendation which can be incorporated into their daily lives and routines. The impact of this strong social component and its effects on a patient's ability to comply with an intervention should not be underestimated. Evidence-based care helps to minimise huge variations in the practices of healthcare professionals and helps to ensure the best, most effective care is provided to patients, in an environment where financial resources are limited [38], whilst clinical judgement reflects the demands of the real life environment. Ideally evidence-based practice and clinical judgment should be used in conjunction to provide the best nutritional care for patients. Whilst dietitians reported being influenced by a patient's individual circumstances in the case scenarios, the ease of implementation of the intervention was also an influential factor in the decisions about oral nutrition support. In hospitals, where the provision of FB interventions that are appealing to acutely unwell patients can be challenging, ONS may be considered an 'easier and often cheaper option'.

Departmental protocols, professional management pathways and published research were three of the four main factors influencing practice by the majority of dietitians surveyed. This is in agreement with other online survey studies in the literature. Judges et al [39], found that 70% of 678 dietitians who took part in a UK-wide survey, indicated that there was a relevant departmental protocol in place and 45% of respondents were influenced 'a lot' by departmental protocols when commencing new enteral tube feeding regimens. Sixty six percent of respondents who reported mandatory application of NICE guidelines [9] within their dietetic departments indicated that the guidelines exerted 'a lot' of influence [39]. A survey of renal dietitians in Australia reported that practice in 62 out of 65 respondents was significantly influenced by evidence-based practice guidelines, but was unaffected by the age, gender, location, years of experience in renal practice or research experience of the dietitian [40]. However, the positive correlation between years of experience and confidence in oral nutrition support practice observed in this study was also observed in the study by Judges and colleagues [39] which found that dietitians with more years in practice were more influenced by clinical experience when devising a new feeding regimen. Inclusion of case scenarios within this survey which tested clinical application, suggested that opinion and attitude about influences on practice was contrary to actual practice, which might reflect the lack of specific guidance in this area or the overriding dependency on clinical judgement when faced with a real-life situation.

In clinical practice, the cost to the patient and healthcare provider may vary dramatically by clinical setting, although this does not necessarily represent cost effectiveness. While ONS in hospital may be conceivably cheaper for acute healthcare providers due to industry tendered contracts, they are potentially more costly for primary care providers when prescribed in the community, where FB interventions may be implemented at a greater cost to the patient. It is no

surprise that costs to the patient and healthcare provider almost equally divided the dietitians sampled. Dietitians in primary care reported using individual interventions, specifically FB interventions, more than any other group, despite a recent systematic review which highlighted that more favourable clinical and financial outcomes were associated with ONS use in community settings and therefore ONS were deemed more cost effective in that context [33]. However, given the aforementioned focus on reducing prescriptions for ONS in this area, the greater use of FB approaches highlights the strong influence of costs and local guidelines on practice.

Despite the interesting findings in this study, it has some limitations. Firstly, lack of a pre-existing questionnaire which has been rigorously tested for reliability and validity [26, 41, 42] led to a bespoke questionnaire being designed for the study, but because of limited time and resources, assessment of validity was minimal. Secondly, given the response rate achieved in this study (3%), it is questionable whether the dietetic profession was adequately represented by the study sample. The response rate achieved was considerably lower than the 60-75% response rate considered acceptable in survey research [41] and threatens the representativeness of and external validity of the study. Other similar studies have also had variable success in achieving a good response rates amongst dietitians using a variety of sampling approaches [39, 43–46]. Thirdly, this study captures reported practice rather than actual clinical practice, an inherent limitation of a self-completed questionnaire study design [42]. As this study was cross-sectional and descriptive, the results are limited in their ability to capture fully the influences on clinical decision making or to illuminate in-depth understandings of clinical reasoning where the patient perspective comes into play and likely requires a qualitative or mixed method approach. One element which is completely absent is the patient perspective and practice in the real-world context may be very different from that reported here. Finally, despite the clinical relevance of the results observed in this study, many of the statistical correlations reported carried small effect sizes according to Cohen guidelines [47].

Given the plethora of research evidence and clinical guidelines to suggest that dietary intervention in disease-related malnutrition amongst adults offers a number of clinical benefits, there is no reason to suggest that patients should not continue to be referred to a dietitian for oral nutrition support. Clinical guidelines derived from high quality trials, rather than consensus expert opinion, that outline whether FB/ONS/COMB interventions are more appropriate under particular clinical circumstances would facilitate an evidence-based approach to the clinical decisions dietitians have to make in oral nutrition support practice. At present, these decisions are left to the clinical judgement of the dietitian and may be highly variable. The implications for patient outcomes remain unknown. To advance as a profession, dietitians must continue to demonstrate evidence-based practice, however, although many dietitians have indicated favourable views about evidence-based practice, few reported that they had the skills and knowledge to apply it to their

practice [44]. As clinical guidelines do not exist for every area of dietetic practice, dietitians must be capable of reviewing the evidence for a particular clinical question and applying skills of critical appraisal in making clinical decisions. Evidence-based care and skills of critical appraisal should also be actively encouraged in the training of student dietitians, extending beyond the academic setting so that evidence-based practice can also be observed and applied within the clinical setting.

Data on the use of FB/ONS/COMB strategies and the factors which influence their application in clinical settings within the UK were previously lacking. This study highlights inconsistencies in clinical management and reiterates the need for further research into the experiences and views of patients on the receiving end of these oral nutrition support interventions. Furthermore, dietitians' opinions in relation to oral nutrition support approaches appeared to conflict their reported clinical practice. Research endeavours continue to try to define similarities and differences between the FB and ONS interventions and should data provide clear support for specific strategies in defined patient groups, it will be important to understand current management practices when developing implementation strategies. This could potentially also inform targeted training when areas of practice are outside of recommendations. As observed in other areas of dietetics [34, 36], there appear to be inherent differences between recommendations and clinical practice. It is difficult to say that this study is further evidence of this, as this was not an audit of practice against recommendations specifically, but the variation in practice found, suggests that there might be differences. Greater use of FB only in the community suggests that maybe local guidance is being followed in this area. Perhaps the employment of procurement dietetic posts has placed a greater focus on managing practice within the recommendations. This study offers some tentative explanations about why practice varies, although this would need to be followed up in a more focused study. Future research in this area should focus on studies with designs incorporating both observation and triangulation of approaches to allow greater understanding of the choices made by dietitians as well as capturing the patient perspective and impact on outcomes. This would more clearly illuminate what dietitians are doing in practice and inform the debate on efficacy of different approaches to oral nutrition support.

Overall, a need remains for evidence-based clinical guidance based upon robust studies comparing the long-term clinical effectiveness the various forms of oral nutritional support, in order to inform dietetic practice. This will facilitate more effective, consistent clinical management of malnourished patients through the use of FB/ONS/COMB interventions as appropriate for optimal patient benefit.

Transparency Declaration

The lead author affirms that this manuscript is an honest, accurate, and transparent account of the study being reported. The reporting of this work is compliant with STROBE guidelines. The lead author affirms that no important aspects of the study have been omitted and that any discrepancies from the study as planned have been explained.

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