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Qualitative study of patients and health-care professionals' views on the efficacy of the nutrition as medication oral nutrition supplement program

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Abstract

Aim The use of concentrated oral nutrition supplements dispensed in small volumes throughout the day at medication rounds is a common nutrition support strategy. Often termed 'Nutrition as Medication' or NAM, it is associated with excellent rates of patient consumption. However, administration of NAM has been described as suboptimal. The aim of the present study was to identify and explore factors influencing the efficacy of the NAM program from a qualitative perspective. This included exploring issues relating to knowledge, administration and patient consumption from a patient and health professional perspective. **Methods** Semistructured interviews with patients (n = 7) and eight focus groups with nursing, medical, pharmacy and dietetic staff (n = 63) were conducted. Interviews were conducted in the workplace and were recorded and transcribed verbatim. Data were analysed from a realist theoretical position using the thematic framework approach. **Results** Five themes were identified that impact on the efficacy of the NAM program. These include the need for clear role delineation among health professionals regarding responsibility for each aspect of NAM. Other themes that emerged included misconceptions about the importance and relevance of the treatment; perceptions of poor palatability and issues associated with the logistics of providing the supplements within the hospital setting. **Conclusions** Dietitians should be aware that there are a range of factors that influence the efficacy of the NAM strategy, including the knowledge and values of individual health professional staff. In addition, increased awareness is required by dietitians regarding the structural barriers to administration and receiving of NAM at the ward level.

Disciplines

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**Qualitative study of patients and health-care professionals’
views on the efficacy of the nutrition as medication oral
nutrition supplement program**

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Abstract

Aim: The use of concentrated oral nutrition supplements dispensed in small volumes throughout the day at medication rounds is a common nutrition support strategy. Often termed 'Nutrition as Medication' or NAM, it is associated with excellent rates of patient consumption. However, administration of NAM has been described as suboptimal. The aim of this study was to identify and explore factors influencing the efficacy of the NAM program from a qualitative perspective. This included exploring issues relating to knowledge, administration and patient consumption from a patient and health professional perspective.

Methods: Semi structured interviews with patients (n=7) and eight focus groups with nursing, medical, pharmacy and dietetic staff (n=63) were conducted. Interviews were conducted in the workplace and were recorded and transcribed verbatim. Data were analysed from a realist theoretical position using the thematic Framework Approach.

Results: Five themes were identified that impact on the efficacy of the NAM program. These include the need for clear role delineation amongst health professionals regarding responsibility for each aspect of NAM. Other themes that emerged included misconceptions about the importance and relevance of the treatment; perceptions of poor palatability and issues associated with the logistics of providing the supplements within the hospital setting.

Conclusions: Dietitians should be aware that there are a range of factors that influence the efficacy of the NAM strategy, including the knowledge and values

of individual health professional staff. In addition, increased awareness is required by dietitians regarding the structural barriers to administration and receipt of NAM at the ward level.

Keywords :

dietetic practice, protein-energy malnutrition therapy, Med Pass, nutrition supplementation

Introduction

Management of disease-related malnutrition in hospital patients is a costly and complex problem. Malnourished patients have impaired recovery from illness, longer hospital stays and higher mortality rates.¹ The health care costs of managing malnourished patients are twice those of well nourished patients with similar underlying illnesses.²

One strategy used to treat malnutrition is the use of concentrated oral nutrition supplements (ONS) dispensed in small volumes at medication rounds. This strategy is often termed 'Nutrition as Medication' (NAM)³⁻⁴ or 'Med Pass'.⁵⁻⁷ Implementation and administration of NAM at the ward level is often described as haphazard.^{4,8} One recent systematic review of oral nutrition supplements found compliance to the recommended prescription of ONS was lowest when administered as part of medicine rounds.⁹ Our research group has reported that only 58% of patients prescribed NAM actually received it.⁴ However when patients did receive NAM correctly as prescribed, compliance was excellent (consumption rates of 96%), as is consistent with previous literature.⁹⁻¹²

Few qualitative studies exist that have elucidated the possible factors behind poor compliance with the NAM strategy. One study using semi structured patient interviews identified that palatability was the main barrier to consumption of NAM.¹³ Research with health professional staff in the same study revealed a high regard for the role of the NAM in the management of malnutrition but few would consume the supplements themselves. The limitation of this study was that factors affecting administration and prescription were not recorded.

The aim of this study was to identify and explore factors influencing the efficacy of the NAM program at a major tertiary hospital in New South Wales, Australia, from a qualitative perspective. This included exploring issues relating to knowledge, administration and patient consumption from a patient and health professional perspective.

Methods

This qualitative study was embedded in a larger mixed method study using a sequential explanatory approach.⁴ This research design is characterised by collection and analysis of quantitative data, followed by a qualitative approach. The purpose of the qualitative aspect is to explain or give greater understanding to the quantitative data.¹⁴⁻¹⁵ It also enables data triangulation; that is to determine the convergence and divergence of the results obtained.¹⁴

The theoretical approach used for this research was an inductive approach using a realist research epistemology. This approach guided the design and implementation of the study. The rationale for utilising this approach was to attempt to understand the thoughts of patients and staff in the hospital environment, and the reasons that drive their actions. This approach allows people to represent themselves in their own words.¹⁶

The research was conducted at a metropolitan hospital that is the sole tertiary hospital in the local health district and the major teaching hospital for the local university. NAM has been routinely used at this hospital for nine years and was initiated by the dietitians in consultation with medical and nursing staff.

Dietitians are the predominant initiators of NAM and rely on medical staff to record the NAM prescription on the medication chart. Since inception, limited formal education on NAM has been provided to ward staff.

All patients enrolled in the quantitative aspects of the larger study on the NAM program were invited to participate at the time of study enrolment. Patients were required to be assessed as malnourished or at risk of malnutrition and not willing or unsuitable to consume standard hospital supplements. Permission was obtained from relevant Managers to undertake the research and approach their staff for recruitment.

Two different interview schedules were developed for patients and health professionals. The main aim was to explore knowledge and opinions about the NAM program. For health professionals, the interview questions also explored perceptions about their role in the NAM program.

Semi structured interviews were used to obtain data from patients. These were conducted over a two month period (1 July to 30 August 2009). Interviews were conducted by the Project Officer in a quiet room located on the ward or at the bedside, to allow for privacy and confidentiality. Family members were invited to be present if desired by the patient. A set of pre-prepared open ended questions with prompts was used as a guide (Table 1). Four of the seven interviews were audio recorded and in the remaining three patients who declined to be audio recorded, detailed notes were kept of the conversation and transcribed as soon as practicable after the interview. Interviews lasted between 15 and 25 minutes.

Permission to conduct the research with staff was obtained from the relevant management personnel. All nursing, medical and pharmacy staff rostered to work on the two study wards on a prearranged day were invited to participate in the focus groups. All dietitians rostered to work on a prearranged day were invited to participate in the focus groups. Focus groups were audio recorded. A topic guide (Table 2) was used to facilitate discussion and explored similar areas to patients but with differing prompts depending on the type of health professional present. Focus group length varied from 14 to 35 minutes.

The research team approached the process of coding without trying to fit it into any pre-existing coding frame.¹⁷ Once themes were identified, the meanings were assumed to be straightforward and directly reflect the experiences of the participants based on what people had said.¹⁷

Voice recordings were transcribed verbatim by the lead author (KL). All transcriptions were checked for accuracy by the study research assistants. Data were analysed using the Framework Approach.¹⁸ This is a highly systematised way of approaching thematic analysis and enables a clear audit trail of results generation as well as enabling comparison between and within groups.¹⁹⁻²⁰ In this study, familiarisation with the data was obtained via the constant re-reading of the transcripts. The process of identifying a thematic framework was achieved using in-vivo coding to retain participants own phrasing. The final three stages of indexing; charting; and mapping and interpretation were conducted manually using a cut and paste approach and enabled comparison and contrasting of themes within and between professional and patient groups.

Ethics approval was granted by the University of Wollongong and South East Sydney Illawarra Area Health Service research Human Research Ethics Committee. All participants provided written informed consent. Most interviews were conducted by a Project Officer not known to the participants to minimise bias.

Results

Seven patients were interviewed and were mostly elderly male patients (see Table 3). Eight focus groups were conducted involving a total of 63 health professionals. The characteristics of the participants of the focus groups are represented in Table 4.

Five main themes were identified that were common to all groups. Quotes in the text below were selected from both interviews and focus groups to illustrate the key themes whilst also reflecting the views of a range of participants.

Theme 1: Knowledge: knowing who, why, when, what and how

The theme of knowledge about the intricacies of the NAM process was common to all groups except dietitians. This is evident from the demographic data in Table 4 where all dietitians but only a minority of staff had ever attended any formal training on the NAM program. For patients, their knowledge of the process was only superficial and possibly reflected the manner in which the supplements were described to them:

“ All I know is that it has plenty of lovely vitamins and stuff in it to make me heal”(Female patient, 79 years old)

For staff, the lack of knowledge about the process, composition of the supplements used and the duration were often discussed as a source of frustration and bewilderment. For example:

“Young pharmacists or new interns do not know what the (NAM) is. They think oh it’s a drug ... and they and the nurses who are new are chasing around trying to find what it is”(Pharmacist)

This lack of knowledge was also described as a potential source of medication error with an example provided of an atypical supplement being written on the chart (Arginaid TM) being mistaken for Anginine:

“Um, and it, it looked like it could have been one of our anti - angina medications the way it was so poorly written”(Pharmacist)

In other cases, nursing staff described their poor understanding of the program rationale :

“I’m concerned – is it a short term thing or long term thing ? like we’re giving these people their nutrition but when they’re off it are they just gonna get malnourished again, does that make sense ?”(Nurse)

Medical staff expressed reluctance to transfer NAM orders onto discharge prescriptions due to a lack of knowledge about the cost and the process of obtaining NAM in the community. A common theme among nurses was the confusion associated with commencement on NAM for patients who are not obviously underweight or visibly malnourished, and reluctance to dispense the NAM to these patients:

*“Yeah some of the (patients) are quite...chunky, you know and I think why are **you** on this ?”(Nurse)*

Theme 2: Valuing the contribution of NAM

Dietitians felt strongly that nursing and medical staff did not understand or value the contribution that NAM could make to meeting a patient's nutritional requirements. This group felt that if other health professionals understood and valued the contribution more highly they would be more supportive and also actively 'sell' the concept to patients (and thus improve compliance and consumption). For example:

“Nursing staff valuing it... or understanding it...so, if they don't buy into it as being important, then they're not going to provide it as its charted”(Dietitian)

This was also described by nurses themselves who felt that a lack of knowledge did contribute to their undervaluing its potential role:

“We don't have a lot of information from the dietitian about how these things work and we just look at other areas and we just forget about their nutrition... The doctors or whoever it is just writes it on there and we just do it”(Nurse).

In contrast to this, despite a lack of knowledge about NAM, patients placed a high value on the strategy. This was typically expressed as a sense of trust that the health professional would be doing the 'right thing for their health'. For example:

“Oh I think it’s important. If a person in power is telling me, well, so that’s good enough for me”(Male patient, 80 years old).

Theme 3: Role delineation and making decisions about NAM

All groups (except dietitians) expressed confusion regarding the NAM process. Patients were unsure if they needed to ask the nurses for it to be delivered; medical staff believed they should be more proactive and identify malnourished patients who may benefit. Nurses discussed that dietitians should be more proactive and educate staff about the supplements used and the NAM process. This was perceived to lead to reduced time wasted by staff trying to obtain stock. Dietitians in contrast, felt that their role was clearly defined and that other staff understood the process well. The impact of this poor understanding led to many descriptions of the process. For example some nurses felt that it was ‘only’ a nutrition supplement and when stock was absent it could be missed. Other nurses reported that they made an individual judgment each time about dispensing the prescription and this led to adding more or less supplement. In some cases they also omitted it completely based on factors like previous blood sugar readings. This concept of staff making decisions about the NAM prescription is typified in one quote from a nurse which was strongly agreed to by all present:

“We are more than nurses on this ward. We know these people inside and out and we know... we think ‘gee they’re not eating anymore’ ...so we are nutritionists as well...its true, we are, we are, we are...but if

they're not eating and drinking ok, well you know (we) just give them the half glass (instead)"(Nurse)

Theme 4: 'Selling' NAM

There were two distinct opinions about the 'selling' or marketing of the NAM concept to patients. Medical staff felt that it should be described to patients in a didactic fashion to improve compliance. In contrast, dietitians felt that they should do so in a negotiated manner that included the patient's views. In addition, medical staff and dietitians repeatedly expressed the strong opinion that nursing staff were responsible for the continued selling of the concept to patients at each delivery.

"I think we need to get the nurses on side to emphasise just how important they are in, and just like they ensure the patients you know swallow the pills or tablets" (Doctor).

This view was not held by the nurses interviewed and they spoke negatively about their role, often describing it as a process of '*needing to twist a patient's arm to take it*', or '*feeling like we are shoving it down their throat*'. Nurses described that they often needed to 'think creatively' to convince patients to consume it. When this approach failed they often resorted to a didactic approach:

" then it's just like kids, slap em and say its gotta be given or else"
(Nurse)

Theme 5: Barriers to consumption of NAM

A number of sub categories emerged from the data that were related to the process of NAM administration and consumption and this was consistent across all groups. The perceived poor palatability of the oral nutrition supplement used was raised by all groups as a potential barrier to consumption, particularly the perceived overly sweet taste and unpleasant odour:

“I think I had one patient and I specially asked her about it and her specific words to me were ‘it’s bloody awful and I wouldn’t wish it on anybody’...and so I said she didn’t have to take it”(Nurse)

Several doctors reported that they devised their own variations of NAM to overcome potential palatability problems. These included variations to charting, such as providing one whole can each time or advising patients to dilute the supplement.

Most participants expressed the view that NAM should be used for a short duration rather than a prolonged period:

“I think tolerance tends to decrease over time...the longer they’re on it the less willing they are to carry on...the taste fatigue sets in and they just go and they say ‘it just makes me feel sick, so no more’”(Dietitian)

Concerns about packaging of NAM were raised by all groups, with staff reporting the need to decant a small volume into a cup as being problematic. This was often related to varying levels of cups in stock or to variations in the amount actually prescribed.

A final but significant issue discussed by all professional groups was the NAM charting. Pharmacists reported that it needed to be clearly identified as an oral

nutrition supplement and not medication. Dietitians expressed frustration at the time required to have a NAM prescription entered onto the medication chart. Some dietitians felt that being able to chart NAM themselves may facilitate more timely initiation of NAM. The concept of being able to 'trust' the accuracy of the medication chart was raised by all professional groups. Medical staff and dietitians often noted that a whole can would be left at the patient bedside despite the amount having been signed as delivered as 60ml qid. Nurses verified this observation, with agreement from all staff present that the behaviour occurred. In addition, the concept of adding more supplement than what was charted was also highlighted:

"I would too, I'd give them more, because I know that they're not having enough in that intake, so I just up it, and I know I am signing it as 60ml, but I am, ok, I am signing it as my 60ml, I'm sorry"(Nurse)

Dietitians reported that they used the medication chart to verify information about compliance with NAM that they obtained from patients. The timing of the NAM prescription was often manipulated by pharmacists to avoid drug-nutrient interactions or delayed by nursing staff due to environmental influences such as patient absences from the ward, nausea or inconvenience.

Discussion

This study has provided insights into factors that influence the efficacy of the NAM program at a tertiary Australian hospital. Five main themes emerged that demonstrate that factors such as knowledge and values as well as structural

factors relating to delivery and consumption of NAM were major determinants of administration and implementation of the supplementation strategy.

This study is consistent with previous research in several aspects. For example, evidence that oral nutrition supplement provision via NAM was associated with charting discrepancies is not new.^{8,10, 21} However the present study expands on previous research in the area by identifying a number of barriers in the successful implementation of NAM and these include: role confusion amongst health professionals regarding who is responsible for each aspect of NAM; misconceptions about the importance and relevance of the treatment; the patients' palatability issues with the intervention and the logistics of providing the supplements within the hospital setting.

We report here, for the first time, that deviations from prescribed dosages of NAM commonly occur because of nurses' subjective assessments of a patient's nutritional status or clinical condition. It is concerning that in this study there were intentional mistakes committed by staff, such as giving more or less of the NAM dose but signing it as correctly given. In addition, the practice of leaving the remaining contents of a can at the bedside may have implications for food safety as well as providing a confusing message to the patient as to how much they are required to consume. Other Australian authors have reported that medication errors often occur due to a lack of familiarity with protocols or a lack of knowledge.²² Whilst it is unlikely that NAM documentation errors have a potential for significant harm, they do result in potentially significant changes to a patient's nutrition supplement prescription. Documentation errors also indicate

a potential problem with medication reconciliation practices and a potential area for quality improvement.²³

Patients in this study expressed a dislike of the taste of the supplements provided on the NAM program. This is consistent with previous reports on the acceptability of oral nutrition supplements ²⁴⁻²⁶. The present research also appears to confirm previous suppositions that prescribing a nutrition supplement elevated its importance for the patient to that of a treatment rather than as a food.²⁷⁻²⁸ Patients in this study were willing to continue taking supplements due to the contribution they felt it was making to their recovery despite the poor palatability. Patients and staff involved in the present study were eager to provide practical suggestions to improve the palatability of the supplements. These included the need to investigate methods to decrease sweetness; ensuring it is chilled and offering a range of flavours. This is also consistent with previous literature.⁹

This study has identified that health professional staff lacked awareness and understanding of their role and that of others regarding the NAM process. A lack of clarity about the role of various health care professionals in the nutritional management of patients and a fragmentation of nutrition care into discipline specific tasks has been identified previously.²⁹ In our study, poor role delineation led to suboptimal variations of the nutrition prescription, often without the dietitian's knowledge. In contrast to previous studies,²⁹ this was often because the health professional staff felt empowered to act on cues that a person was eating poorly or appeared malnourished. It remains a challenge for dietitians to harness this enthusiasm by staff in order to maintain the efficacy of

the program. Strategies such as the provision of ongoing education for hospital staff and increasing awareness of NAM roles and responsibilities appear warranted.

The critical role and involvement of nurses in the success of NAM was a theme common to all groups. Nurses interact with patients multiple times each day. There are very few qualitative reports investigating the critical role that nurses play in encouraging oral supplement intake or providing nutrition care more broadly, especially in the hospital setting.^{13, 30-32} The results of this study suggest that the way NAM is described and offered to patients by staff has a large impact on administration, delivery and consumption. Research has shown that nutrition education of nursing staff can translate into changes in attitudes and an improvement in meeting individual patient needs.³³⁻³⁴ In a previous observational study of nursing encouragement of eating in a nursing home setting, nurses spent less than one minute encouraging consumption.⁸ Nurses in the present study varied nutrition prescriptions and the encouragement given to patients. Improved communication between all health professionals is required to ensure consistent good practice and optimal compliance to the NAM prescription.

Strengths of this study include the relatively large range and number of health professionals involved and the use of a qualitative approach that reached theoretical saturation regarding barriers to oral nutrition supplement consumption via the NAM strategy. Limitations include a lack of generalisability of the findings, as participants were mostly male patients recruited from two wards at one geographic location. The views of elderly males may not be

representative of the other patient groups. However, this context-specific study contributes to the sparse literature exploring factors that impact on the efficacy of the NAM strategy. It helps advance our limited understanding of NAM by highlighting structural, knowledge and attitudinal barriers that impact on both the prescription and administration of NAM.

These findings have important implications for dietitians involved in the provision of NAM. A recent systematic literature review indicated that compliance was greatest with supplements of higher energy density and when advised to consume as small volumes frequently i.e. via NAM.⁹ This may indicate that consideration be given to ONS provision via NAM as a first line therapy. To enhance the efficacy of NAM, several institutional aspects require consideration. Firstly, attention to potential knowledge deficits of staff is required. Implementation of basic training for all staff and for education to be delivered on a regular basis due to high staff turnover is warranted. Dietitians may also benefit from identifying a ward champion to maintain ward enthusiasm and commitment to the program. Attention to factors such as regular review, packaging, potential taste fatigue and documentation may also improve efficacy.

Given that malnutrition is a costly problem, ongoing research into the efficacy of methods used to treat malnutrition is important. Dietitians should be aware that there are a range of factors that detract or enhance the efficacy of the NAM strategy, including knowledge and values of individual health professional staff. In addition, increased awareness is required of the structural barriers to administration and receipt of NAM. This may require investigation into the most

effective strategies to improve health professional knowledge and promote positive behaviour change. Finally, attention to the issues pertaining to palatability and the role of encouragement will ensure that improvements can be made to the numbers of patients correctly receiving and consuming NAM as part of their clinical management. Studies in other countries utilising different models of NAM and with patient groups of different ages and sex are warranted.

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CONFLICTS OF INTEREST

None identified

AUTHORSHIP

Kelly Lambert: Data analysis; primary responsibility for writing the article.
Maureen Lonergan: Conceptualisation of study design; writing the article. Jan Potter: Conceptualisation of study design; writing the article. Linda Tapsell: Conceptualisation of study design; writing the article. Karen E. Charlton: Conceptualisation of study design; writing the article.

References

1. Lim SL, Ong KCB, Chan YK *et al*. Malnutrition and its impact on cost of hospitalisation, length of stay, readmission and 3 year mortality. *Clin Nutr* 2012; **31**: 345-350.
2. Guest JF, Panca M, Baeyens JP *et al*. Health economic impact of managing patients following a community-based diagnosis of malnutrition in the UK. *Clin Nutr* 2011; **30**: 422-429.
3. Jukkola, K. and MacLennan P. Improving the efficacy of nutritional supplementation in the hospitalised elderly. *Australas J Ageing* 2005; **24**,119–124
4. Removed for blinded peer review
5. Robinson GE Prevent weight loss...Push calories with meds. *Journal Amer Diet Assoc* 1997; **97**, A100.
6. Lewis DA and Boyle KD. Nutritional Supplement Use During Medication Administration. *J Nutr Geront Geri* 1998; **17**; 53-59.
7. Kerrigan N. Dispensing of a calorically dense oral supplement with medication pass: a creative approach to oral supplementation. *Journal Amer Diet Assoc*. 1996; **96**, A32.
8. Simmons SF and Patel AV. Nursing home staff delivery of oral liquid nutritional supplements to residents at risk for unintentional weight loss. *J American Ger Society*. 2006; **54**; 1372-1376.
9. Hubbard GP, Elia M, Hodoway A, Stratton RJ. A systematic review of compliance to oral nutrition supplements. *Clin Nutr* 2012; **31**, 293-312.

10. Whiteman E, Ward K, Simmons SF, Sarkisian CA, Moore AA. Testing the effect of specific orders to provide oral liquid nutritional supplements to nursing home residents: A quality improvement project. *J Nutr, Health, Aging*. 2008; **12**; 622-625.
11. Welch P, Porter J, Endres J. Efficacy of a Medication Pass Supplement Program in Long-Term Care Compared to a Traditional System', *J Nutr Geront Geri*. 2003; **22**: 19-28.
12. Doll- Shankaruk M, Yau WNC, Oelke C. Implementation and Effects of a Medication Pass Nutritional Supplement Program in a Long-Term Care Facility A Pilot Study. *J Geront Nurs*. 2008; **34**; 45-51.
13. Lad H, Gott M, Gariballa S. Elderly Patients Compliance and Elderly Patients and Health Professional's Views, and Attitudes Towards Prescribed Sip Feed Supplements. *J Nutr Health Ageing* 2005; **9**; 310-314.
14. Creswell JW and Plano-Clark VL. Designing and conducting mixed methods of research. Sage Publications, Thousand Oaks, CA. 2006.
15. Carr EJ. Understanding inadequate pain management in the clinical setting: the value of the sequential explanatory mixed method study. *J Clin Nurs*. 2008; **18**; 124-131.
16. Ritchie J and Lewis J. Qualitative Research Practice. A Guide for Social Science Students and Researchers. London. Sage Publications Ltd. 2003.
17. Braun V and Clark V Using thematic analysis in psychology. *Qual Res Psych*. 2006; **3**; 77-101

18. Smith J and Firth J. Qualitative data analysis: the framework approach.
Nurse Res 2011; **18**; 52-62.
19. Pope C, Ziebland S, Mays N. Qualitative research in health care:
analysing qualitative data. *BMJ*. 2011; **320**;114-116.
20. Green J and Thorogood N. *Qualitative Methods in Health Research*.
Sage Publications, London. 2004.
21. Remsberg RE, Sobel T, Cohen A, Koch C., Radu C. Does a liquid
supplement improve energy and protein consumption in nursing home
residents ? *Ger Nurs*. 2001; **22**; 331-335.
22. Nichols P, Copeland TS, Criab IA *et al*. Learning From Error: Identifying
Contributory Causes of medication Errors in an Australian Hospital. *Med
J Aust*. 2008; **188**, 276-279.
23. Hughes CF. Medication errors in hospitals: what can be done ? *Med J
Aust*. 2008; **188**, 267-268.
24. Gosney M. Are we wasting our money on food supplements in elder care
wards ? *J Adv Nurs*. 2003; **43**:275-280.
25. Methven L, Rahelu K, Economou N *et al* . The effect of consumption
volume on profile and liking of oral nutritional supplements of varied
sweetness: Sequential profiling and boredom tests. *Food Qual Prefer*.
2010; **21**: 948–955
26. Lawson RM, Doshi MK, Ingoe LE *et al* . Compliance of orthopaedic
patients with postoperative oral nutrition supplementation. *Clin Nutr*.
2000; **19**: 171-175.

27. Roberts M, Potter J, McColl J *et al.* Can prescription of sip feed supplements increase energy intake in hospitalised older people with medical problems ? *Br J Nutr.* 2003; **90**: 425-29.
28. King's Fund (1992) *A positive approach to nutrition as treatment.*
Available from
http://www.bapen.org.uk/pdfs/bapen_pubs/pub_kings_fund.pdf.
Accessed 30/10/12.
29. Ross LJ, Mudge AM, Young AM, Banks M. Everyone's problem but nobody's job: Staff perceptions and explanations for poor nutritional intake in older medical patients. *Nutr & Diet*; 2011; **68**: 41-46.
30. Bender S, Pusateri M, Cook A, Ferguson M, Hall JC. Malnutrition: Role of the TwoCal HN Med Pass Program. *Med Surg Nurs* 2000;**9**:284-295.
31. Breeveld-Peters JJL, Reijven PLM, Wyers CE *et al.* Barriers and Facilitators of Nutritional Intervention after Hip Fracture in Integrated Care As Perceived By Different Health Care Professionals: a qualitative interview study. *e-SPEN journal.* 2012; e182-e188.
32. Kayser-Jones J, Schell ES, Porter C *et al.* A prospective study of the use of liquid oral dietary supplements in nursing homes. *J Amer Ger Soc.* 1998; **46**: 1378-1386.
33. Christensson L, Unosson M, Bachrach-Lindstrom M, Ek AK. Attitudes of nursing staff towards nutritional nursing care. *Scan J Caring Sci.* 2003; **17**: 223-231.

34. Perry L. Nutrition: a hard nut to crack. An exploration of the knowledge, attitudes and activities of qualified nurse in relation to nutritional nursing care. *J Clin Nursing*. 1997; **6**:315-324