Well-established nutritional structure in Scandinavian hospitals is accompanied by increased quality of nutritional care

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Well-established nutritional structure in Scandinavian hospitals is accompanied by increased quality of nutritional care

Short title: Clinical nutrition improved by structure

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Abstract

Background and aims
Treating undernutrition is shown to be complicated in practise. The aim was to investigate self-reported attitudes, barriers and structure for nutrition practise among Scandinavian hospital nurses.

Methods
A questionnaire based investigation among 6000 nurses in Scandinavian hospitals including demographic data, attitudes and practise, knowledge, education and barriers. A definition of well defined organisation structure (w-DS) concerning nutritional aspects and less well defined structure (p-DS) was made according to ESPEN recommendations.

Results
Overall 2759 (46%) nurses responded. More than 90% had a positive attitude to the nutrition care process, however elements of the process were only practised in 13-48% (p=0.0005). A well defined structure was found in 49.4% of the departments. Routines concerning the nutritional care process in w-DS vs. p-DS: Screening (81 vs. 46%), nutritional requirements (88 vs. 41%), registration of food intake (80 vs. 57%) and a nutrition care plan (60 vs. 31%), p < 0.0001. Barriers were most often: screening (24%) calculating energy intake (53%) and making nutrition plans (61%)(p=0.0005). However, most had an interest in nutrition (77%).

Conclusions
There were a major discrepancy between attitude and practise concerning the nutritional care process. However, a well defined organisation structure positively influenced this process. Generally more education and focus on making nutrition plans are needed.
Introduction

The prevalence of disease-related undernutrition is reported in more than 30% of hospitalized patients when admitted, and even more patients increase or develop undernutrition during hospital stay (1-4). Hospitalized, diseased patients often have an increase in resting energy expenditure, thus, the energy and protein requirements are increased. During disease however, most patients have an interrupted regulation for the feeling of hunger and appetite. Also early satiety, nausea and pain, are amongst problems that compromise patients ability to respond adequate to the nutritional demands of increased metabolism. This way a shortage of energy, protein and other nutrients quickly appear as adverse effects on body shape, size, composition and function, and is the understanding of undernutrition in this article.

The association between undernutrition and increased side effects has been well documented (6-8) such as a higher rate of pressure ulcers, pneumonia, cystitis (2,6,9), and depression (10). In addition, undernourished patients are known to have altered need of nursing care (11-16). All these elements prolong length of hospital stay and convalescence (1,13,14,17), as well as deteriorate quality of life for the patients (2,11,18). It has been determined, that inadequate knowledge, lack of instructions and the attitude amongst hospital staff towards recognizing undernutrition, as well as lack of support from leaders, are considerable barriers to inadequate nutritional care in hospitals (3,14,19-21).

During the last decades, guidelines to prevent and treat undernutrition in hospitals have been prepared from different interest societies around the world. In Europe, the European Society of Clinical Nutrition and Metabolism (ESPEN) recommends screening-tools targeting hospitalized patients, and elderly patients in nursing homes respectively, in order to find patients at nutritional
risk. When patients are found to be at risk, ESPEN Guidelines recommend a detailed assessment and an individual care, treatment, monitoring, and follow-up plan.

Also, the Council of Europe recommends that all patients should be screened for nutritional risk using an evidence-based method that considers age, sex, cause, and severity of disease.

To ensure the quality of preventing and treating undernutrition in hospitals, recommendations for organisation and structure are also considered by ESPEN (7, 25). These recommendations include nutrition education for hospital staff and instructions for assignment of responsibility between the task-forces. Furthermore, they include staff knowledge of quality-goals, and whether the staff understands the consequences for the patients, if the quality goals are not met. The leaders and managers are recommended to give priority to nutritional aspects in the daily work and to participate in multi-professional nutrition teams, which should be established in every department.

Within the recent years, Scandinavian investigations have suggested that standards for nutrition organisation and structure in hospitals might not fulfill the standard criteria’s established by Council of Europe and ESPEN Guidelines (3, 19). Furthermore, investigations have concluded, that patients still develop undernutrition during hospital stay (2, 9, 21). Recent intervention-studies showed, that neither patients, nor hospital staff considered nutrition as part of the treatment (22), and it is still a frequent failure to recognize and treat undernutrition in hospitals (4, 16, 21, 24). Mowe et al. (19) of which the present study is a part, focused on doctors and nurses attitude to nutritional practise, and the accordance to self-assessed practise. The article concentrated on the difference and the similarity within the nutrition attitudes and practises in the Scandinavian countries, and discussed reasons for these results. The presence of national clinical guidelines was discussed and found important. The article furthermore concluded that there was a wide discrepancy between attitudes
and practice, and that implementing good clinical practise within nutrition was difficult to accomplish.

However, the recommendations concerning the organisational structure and the link between structure and good nutrition practice in hospitals have not been thoroughly described. Some initiatives, however have suggested, that organisation concerning nutrition in the departments is crucial for practical success (14, 20, 23). According to these initiatives the assumption could be made, that there is a correlation between the organizational structure and nurse-experienced actual practice concerning nutrition, however the documentation for this is superficial. Therefore a more in depth evaluation regarding organisational structure of the units seems relevant.

**Aim:**

The aims of this study were:

- To describe nurses’ attitudes towards good nutrition practice according to ESPEN guidelines, versus the nurses self reported actual nutrition practice.
- To evaluate the importance of selected barriers for dealing with clinical nutrition according to nurses self reported data.
- To explore whether nurses working in departments with a well defined organisational structure concerning the management of clinical nutrition as recommended by ESPEN Guidelines, have a better nutrition practice according to these guidelines.

**Study population and Methods**

A questionnaire based investigation among nurses in the Scandinavian countries regarding self emphasized nutritional routines, education and the nutritional structure in their department. This
questionnaire was part of a larger survey amongst doctors, dieticians and nurses, carried out in the Scandinavian countries in 2004 (19), now focusing on the nurses attitudes and practise and the organisational structure.

The questionnaire consisted of 32 questions. In addition to questions pertaining to demographic data, the questionnaire dealt with the following areas:

• Performance versus attitude within the areas of screening for nutritional risk, treatment plan for at-risk patients and monitoring.
• Knowledge, education guidelines and tools.
• Organisation.
• Possible barriers to implementation of nutritional screening and therapy.

The questionnaire was previously tested among Danish doctors and nurses (25). A definition of a well-defined and a poor-defined structure was made, and retrospectively the nurses’ answers were divided into the two structural groups.

Study population
The questionnaire was sent to 6000 nurses in Denmark (DK), Sweden (S) and Norway (N), 2000 in each country. The investigation was part of an inter-disciplinary study, also including 6000 physicians and all registered clinical dieticians. As a central database for nurses was not available, the nurses were found through randomly selected physicians from national databases, by sending five to ten questionnaires to the head nurse in the same department as the selected physicians. Departments of internal medicine, medical gastroenterology, oncology, general - and gastrointestinal surgery, orthopaedic surgery and intensive care were included.
The head nurse was asked to keep one questionnaire, and give out the others consecutively to the first nurses she met in the ward on that particular day. In this way, questionnaires were sent to nurses who were working in the same departments as the doctors. The participants received each an envelope which contained written information about the study. The information emphasized that participation was voluntary. Participants were asked to focus their answers on their opinion of own actual practice and department, and to return the questionnaire anonymously in the enclosed and prepaid postage envelope. Approximately 2 weeks later a reminder was sent.

**Questionnaire**

Demographic questions

Five questions considering age, gender, completion of nursing studies, current place of work and working speciality started off the questionnaire.

Attitudes and routines

The questionnaire covered the following main issues: nutritional screening, monitoring, treatment plan, knowledge, education, tools and guidelines as well as organization and possible barriers to implementation of good nutritional standards. The questions probed participant nurses self reported attitudes to-, and management of nutritional problems. In order to evaluate attitudes and routines regarding the nutrition care process (screening and assessment, initiation of nutrition care plan, monitoring and communication), the nurses were asked to respond on statements concerning what he/she believed ought to be/ was standard practice in their own department. The responses were graded on a 4 point ordinal scale, ranging between entirely/largely agree or entirely/largely disagree.
Barriers

The questionnaire also included statements about self-assessed education and knowledge within clinical nutrition, insight in the importance of adequate nourishment, experience of the use of tube- and parenteral feeding and difficulties with managing the nutrition care process. Barriers were investigated with statements assessed by the answers “totally agree; moreover agree; moreover disagree; disagree”. I.e.:” Nutrition is a permanent part of the staff education programme?”, and “My education has given me a sound basis for decision making around clinical nutrition?” The questionnaire is also described in a previous article (19).

Structure

Definition of a well-defined and a poor-defined structure

The clinical units were defined as having a well-defined structure (w-DS) if the participants reported in the questionnaire (i.e., answered with yes), that they were organised with three or more of the following five organizational structure markers, recommended for organisations by ESPEN Guidelines: 1) A multidisciplinary nutrition team 2) A resource person within nutrition, 3) Guidelines for identification of patients at risk of undernutrition, 4) Assignment of responsibility, 5) Education for nursing staff. Furthermore, these structure markers were selected according to previous Danish results, that showed these were very important structure makers in implementation of nutrition practise (20,22).

The clinical units were defined as having a poor-defined structure (p-DS) if they had two or less of the five organizational markers in the departments.

The two different structures (w-DS and p-DS) were secondly compared to the nutrition care process as defined by ESPEN; 1) Nutritional status evaluated on the patients admission, 2) Energy intake
taken into account on ward rounds, 3) Patients weighed on admission, 4) Energy requirements determined before prescribing nutrition therapy, 5) Monitoring of energy intake and 6) Description of nutritional regime in patient records.

**Statistical methods**

The results for the three countries were analysed together. All incoming questionnaires were included. In case of missing answers, the answers provided were included. Descriptive statistics was used to calculate the response frequency. To test the statistical difference between two independent groups (w-DS vs p-DS) we used for nominal data, Chi-square ($\chi^2$) test and for ordinal data, Mann–Whitney U-test. A multiple logistic regression analysis with organizational structures (well-defined vs. poor-defined) as dependent variables, and age, time since graduation, type of hospital, education and knowledge as independent variables was done. Test for linearity of both time since graduation (years) and knowledge (10-point scale) was done, and these were included as continuous variables. The level of significance was defined as $p < 0.05$. Data were analysed using SPSS.

**Ethical considerations**

The study was performed according to the Helsinki declaration for human studies and was approved by the ethical committees.

**Results**

**Demographic data**

In total 2759 nurses, responded to the questionnaires. Demographic data are presented in table 1. More than 90% of the nurses completely fulfilled the questionnaire. The majority of the respondents were women and about two thirds were between 30 and 49 years old. About half of the nurses had
been educated for less than ten years. The responders were almost equally divided within the three countries (DK: 35%, N: 32%, S: 33%). The responding nurses were fairly dispersed in age, with the majority (63%) between 30 and 49 years. The Norwegian nurse responders separated themselves by being more often below 30 years of age (28%), and the Swedish by being more often (23% vs. 15% and 11%) between 50 and 60 years old (p<0.0005).

Table 1. Demographic data concerning 2759 nurses in three Scandinavian countries

<table>
<thead>
<tr>
<th>Demographic data</th>
<th>Total %</th>
<th>*DK %</th>
<th>*N %</th>
<th>*S %</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of responders N = 2759 nurses</td>
<td>46</td>
<td>35</td>
<td>32</td>
<td>33</td>
<td>ns</td>
</tr>
<tr>
<td>Response rate</td>
<td>46</td>
<td>35</td>
<td>32</td>
<td>33</td>
<td>ns</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>7</td>
<td>35</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>93</td>
<td>32</td>
<td>91</td>
<td>92</td>
</tr>
<tr>
<td>Age (y)</td>
<td>&lt; 30</td>
<td>19</td>
<td>17</td>
<td>28</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>30-39</td>
<td>31</td>
<td>33</td>
<td>27</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>40-49</td>
<td>32</td>
<td>34</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>50-60</td>
<td>16</td>
<td>15</td>
<td>28</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>&gt; 60</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Graduated year</td>
<td>&lt; 1974</td>
<td>9</td>
<td>9</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>1975-1984</td>
<td>21</td>
<td>23</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>1985-1994</td>
<td>27</td>
<td>29</td>
<td>22</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>1995-2004</td>
<td>45</td>
<td>38</td>
<td>57</td>
<td>39</td>
</tr>
<tr>
<td>Working at</td>
<td>University hospital</td>
<td>40</td>
<td>38</td>
<td>45</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Other hospitals</td>
<td>60</td>
<td>62</td>
<td>54</td>
<td>65</td>
</tr>
</tbody>
</table>

*DK=Denmark, N=Norway, S=Sweden

The sex quote was common for the nurse profession, majoring female nurses in 93% (mean total).

Regarding clinical experience, the nurses experience range was rather wide, concentrating the majority within 10 years past their nurse registration.

The respondents working places were more often other hospital settings, compared to university hospitals (p<0.0005), but no differences between countries. Other hospital settings cover acute intake hospitals with no university functions, but educational function for nursing students.
Attitudes, routines and barriers regarding the nutritional care process

Data for attitudes, routines and barriers are presented in table 2. Ninety percent of the respondents had a positive attitude towards screening the patients’ for nutritional status on admission. Barely one third of the nurses actually performed nutrition screening routinely for all patients on admission (DK 43%; N 15% and S 21%)(p<0.0005). Almost all the respondents agreed that a nutritional care plan should be initiated within 72 hours for patients with compromised nutritional status or those with reduced dietary intake. The nurses more often weighed the patients on admission, than during hospital stay or at discharge. While almost fifty percent had a routine to weigh all patients on admission, only six percent undertook this at discharge. There was an around 45% discrepancy between what the nurses wanted regarding weighing their patients, and what they actually experienced was carried out in their wards. Nearly all nurses agreed that the patients’ energy requirements should be determined before prescribing nutritional therapy. Similarly they agreed that energy intake should be monitored for those at nutritional risk. Only between 15% and 31% of the nurses, answered that this was routine for all patients in their departments. The frequency of monitoring patients’ nutritional intake was very different between the countries. In DK, N and S respectively, 56%, 20% and 28% stated that it was a routine in their unit, to monitor nutrition intake in patients at nutritional risk. On ward rounds, 37% of the responders found it a clinical routine to consider nutrition risk in more than half of their patients. Documentation of nutrition care plan in patients’ records was regarded important by a majority of the nurses (93%). Only a minority answered that such documentation was always included in the patient records in their daily practice (13%).
Table 2. Attitudes and practice concerning the nutritional care process in departments with a well defined structure and a poor defined structure in Scandinavian hospitals.

<table>
<thead>
<tr>
<th>Nutritional care process</th>
<th>Attitude Entirely or largely agree</th>
<th>Practice Yes, this is a routine in all patients at my department</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total group %</td>
<td>Total group %</td>
</tr>
<tr>
<td>Nutrition status should be evaluated in all patients on admission</td>
<td>90</td>
<td>27</td>
</tr>
<tr>
<td>All patients should be weighed at admission</td>
<td>93</td>
<td>48</td>
</tr>
<tr>
<td>Energy intake should be taken in account on wards rounds</td>
<td>92</td>
<td>15</td>
</tr>
<tr>
<td>Energy requirements should be determined before prescribing nutrition therapy</td>
<td>97</td>
<td>31</td>
</tr>
<tr>
<td>Ongoing checks of risk-patients achieving the desirable level of 24-hour energy intake</td>
<td>97</td>
<td>19</td>
</tr>
<tr>
<td>Nutrition care plan should be included in the patients’ records</td>
<td>93</td>
<td>13</td>
</tr>
</tbody>
</table>

w-DS = well defined structure, p-DS = poor defined structure

* p-values refer to a comparison between departments with w-DS and p-DS

# Percentages refer to the total group who take care of the nutritional process in practise

Differences in routines between nurses working at departments with a well-defined structure (w-DS) compared to nurses working in departments with a poor-defined structure (p-DS)

All 2759 respondents replied to the questions implemented in the structure definition. Table 2 shows the differences in the nutrition care process compared to the organizational structure for nutrition. A well defined structure (w-DS) was found in 49% of the participants departments in total, while 51% had a poor-defined structure (p-DS) for the organisation of nutrition matters.
The nurses who worked at departments with w-DS had a higher frequency for screening and weighing the patient on admission, opposed to the nurses working in departments with p-DS (p<0.0001). Simultaneously, they had a higher rate of actually determining the patients’ energy needs, monitoring energy intake for those at nutritional risk and for documentation of the nutritional care plan in the patients records (p<0.001).

No significant difference was found in the structure between those working at university hospitals, and those working in other hospital settings (51 % vs. 49%, ns). The three countries however, were quite different in their organisation structure for nutrition. Denmark in 75%, Norway in 23% and Sweden in 49%, fulfilled the definition for w-DS (p<0.0001). The distribution of five different organizational structures in Denmark, Norway and Sweden is shown in Figure 1. Generally, each of the five structures were found more often in Denmark v.s Norway and Sweden (p<0.0001).

The distribution of structural markers for nutritional aspects showed that in the various countries, having a resource person, guidelines and education programme were the elements that most often selected a department into the group of departments with well-defined structure(p<0.0001). In all countries, the division of responsibility within the task forces was the element most rarely seen in the group of w-DS(p<0.0001).

*Significant differences were found between Denmark vs. Norway and Sweden in all structure elements (p<0.0001)

Figure 1. Distribution of five different organizational structures in Denmark, Norway and Sweden.
Self reported attitudes concerning education, knowledge, interest and barriers for working with clinical nutrition

Personal opinion about education, knowledge, interest and barriers is shown in table 3. Less than two thirds of the nurses responded, that they had a sound basis of knowledge about clinical nutrition through their education, and that they had sufficient knowledge to care for malnourished patients. Education concerning undernutrition had been undertaken in 59% of the nurses departments, and nearly all the nurses found education in clinical nutrition a good idea. Education in clinical nutrition was performed most often in Denmark (72%) vs. Norway (53%) and Sweden (51%) (p<0,005). A significant higher level of knowledge concerning clinical nutrition (measured on a ordinal scale 1-10, > 6 defined as a high level of knowledge) was found in medical and surgical gastroenterology, oncology and geriatrics (p<0,0001). About one third of the respondents found it difficult to identify patients with nutritional problems. Just above half of the respondents found it difficult to calculate the patients’ energy needs. Organising a nutrition programme for the undernourished patients was found difficult by almost two thirds of the nurses.

In departments with a well defined structure for dealing with nutritional aspects, 67% of all respondents found, that their knowledge about clinical nutrition was > 6 (ordinal scale 1-10), vs. 33% in departments with a less defined structure (p<0,0001)

Furthermore, in departments with w-DS, 58% of all respondents found, that their education had given them a sound basis for making decisions regarding clinical nutrition, vs. 37% in departments with p-DS (p<0,0001).

The distribution of well defined structure (w-DS) in different specialities compared between the three Scandinavian countries is shown in table 4. Overall a well-defined structure was most
frequently seen in oncology and medical gastroenterology (p<0.0001). The lowest frequency of w-DS was seen in orthopaedic surgery, especially in Norway and Sweden (p<0.0001).

A multiple regression analysis considering w-DS vs. p-DS as dependent variables showed, that time since graduation and knowledge were both strongly significant independent variables (p<0.001), and less significant were type of hospital (p<0.03) and education (0.04) Table 5.

Table 3. Personal opinion about education, knowledge, interest and barriers

<table>
<thead>
<tr>
<th>Education, insight and routines</th>
<th>Total group</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Scores 1-4 from 1=entirely agree- 4=totally disagree)</td>
<td>%</td>
</tr>
<tr>
<td>My education has given me a sound basis for making decision about clinical nutrition</td>
<td>60</td>
</tr>
<tr>
<td>I personally have sufficient insight into the importance of adequate nourishment for the general progress of the patient</td>
<td>78</td>
</tr>
<tr>
<td>I personally have sufficient routine experience in the use of tube feeding</td>
<td>77</td>
</tr>
<tr>
<td>I personally have adequate routine experience in the use of parenteral feeding</td>
<td>79</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overall knowledge and interest</th>
<th>Total group</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Scores &gt;5 on a scale from 1= inadequate to 10 = very good knowledge)</td>
<td>%</td>
</tr>
<tr>
<td>How well is your knowledge in the treatment of malnourished patients?</td>
<td>61</td>
</tr>
<tr>
<td>How interested are you in the treatment of malnourished patients?</td>
<td>77</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Total group</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Scores 1-4 from 1=entirely agree- 4=totally disagree)</td>
<td>%</td>
</tr>
<tr>
<td>I find it difficult to identify the patients who are in need of nutritional measures and support</td>
<td>24</td>
</tr>
<tr>
<td>I lack techniques for identifying malnourished patients</td>
<td>39</td>
</tr>
<tr>
<td>I find that it is difficult to calculate the patient’s energy requirements</td>
<td>53</td>
</tr>
<tr>
<td>I find it is complicated to organise a nutrition programme</td>
<td>61</td>
</tr>
<tr>
<td>Patients` resistance against having placed a tube is a barrier against introducing tube feeding</td>
<td>44</td>
</tr>
<tr>
<td>Parenteral nutrition is easier for the staff to handle than tube feeding</td>
<td>32</td>
</tr>
<tr>
<td>Risk of complications can refrain the department from using parenteral nutrition</td>
<td>12</td>
</tr>
</tbody>
</table>
Table 4. Well defined structure (w-DS) in different specialities compared between three Scandinavian countries.

<table>
<thead>
<tr>
<th>Speciality</th>
<th>Total number</th>
<th>*Total w-DS%</th>
<th>Denmark n (%)</th>
<th>Norway n (%)</th>
<th>Sweden n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical gastroenterology</td>
<td>60</td>
<td>52</td>
<td>26 (79)</td>
<td>22 (36)</td>
<td>12 (57)</td>
</tr>
<tr>
<td>Oncology</td>
<td>63</td>
<td>58</td>
<td>25 (78)</td>
<td>21 (44)</td>
<td>17 (59)</td>
</tr>
<tr>
<td>Internal medicine / geriatrics</td>
<td>451</td>
<td>57</td>
<td>258 (80)</td>
<td>30 (20)</td>
<td>163 (51)</td>
</tr>
<tr>
<td>Surgical gastroenterology</td>
<td>105</td>
<td>53</td>
<td>69 (86)</td>
<td>16 (20)</td>
<td>20 (50)</td>
</tr>
<tr>
<td>Other surgical speciality</td>
<td>184</td>
<td>45</td>
<td>113 (67)</td>
<td>12 (12)</td>
<td>59 (43)</td>
</tr>
<tr>
<td>Orthopaedic surgery</td>
<td>124</td>
<td>47</td>
<td>83 (77)</td>
<td>7 (11)</td>
<td>34 (38)</td>
</tr>
<tr>
<td>Intensive care/anaesthesiology</td>
<td>229</td>
<td>48</td>
<td>100 (73)</td>
<td>57 (28)</td>
<td>72 (53)</td>
</tr>
<tr>
<td>Others</td>
<td>69</td>
<td>29</td>
<td>13 (43)</td>
<td>30 (21)</td>
<td>22 (38)</td>
</tr>
<tr>
<td>Total</td>
<td>1285</td>
<td>691</td>
<td>195</td>
<td>399</td>
<td></td>
</tr>
</tbody>
</table>

(1) = Respondents with w-DS in % of all respondents from the speciality
* Fraction of departments with w-DS within the different specialities
# Significant differences were found between specialities in each country (p<0.0001)

Table 5. Multiple logistic regression analysis with organizational structures (well-defined vs. poor-defined) as dependent variables, and age, time since graduation, type of hospital, education and knowledge as independent variables in three Scandinavian hospitals

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Regression analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR [95% CL]</td>
</tr>
<tr>
<td>Time since graduation (years)*</td>
<td>1.02 [1.01; 1.03]</td>
</tr>
<tr>
<td>Working place</td>
<td>Other hospital</td>
</tr>
<tr>
<td></td>
<td>University Hospital</td>
</tr>
<tr>
<td>Education</td>
<td>Entirely agree</td>
</tr>
<tr>
<td></td>
<td>Nearly agree</td>
</tr>
<tr>
<td></td>
<td>Entirely disagree</td>
</tr>
<tr>
<td></td>
<td>Completely disagree</td>
</tr>
<tr>
<td>Knowledge</td>
<td>1.57 [1.49; 1.66]</td>
</tr>
</tbody>
</table>

CL = confidence limits, other hospital = all other hospitals than university hospitals
*Age was not significant in the regression analysis, because both time since graduation and age were strongly correlated

Discussion

In the present study, a subgroup analysis of self reported attitudes and routines to clinical nutrition in hospital, among nurses in the Scandinavian countries, has been presented. The nurses’ nutrition practice in general, did not fulfill the criteria’s recommended by ESPEN Guidelines on nutrition care in hospitals (7). However, we found a significant association between departments with a well
organised structure and a good nutrition practice. As a manifesto, nurses working at departments with less developed organisation structure for handling nutritional aspects, showed to have a significantly poorer actual nutritional practice. Although more than two thirds reported to have a sound basis from their education, and sufficient insight and routine experience, one fourth or more found it difficult to deal with nutritional care for malnourished patients. The respondents reported lack of knowledge and assignment of responsibility, difficulty to identify malnourished patients and organising a nutrition programme as main barriers to nutrition practice. The age distribution of the respondents seems compatible with the age distribution experienced in practise, in the Scandinavian countries. The slight overweight of younger nurses in Norway and older nurses in Sweden, does not alone provide an explanation for the various differences in the nutritional practise throughout the countries, as it is responded by the nurses.

Data limitations: In acknowledgement of the relatively low response rate, conclusions should of course, be interpreted with caution. An analysis of the non-respondent group was however not performed. If the respondents were, as intended, chosen consecutively on appearance, the answers are not given by nurses who take the most interest in nutrition, and the data hereby provides a moreover general picture of nurses` knowledge, attitudes and practices towards nutrition, however coincidental. If this is not quite the fact, bias could be that the nurses are the most interested in nutrition, and thereby the responders would have increased knowledge and have more positive attitudes and see better practice regarding nutrition. Thus a bias toward respondents having the most interest in clinical nutrition cannot be excluded, since more than two thirds of the respondents were interested in the treatment of malnourished patients.

The nurses` attitudes towards how nutrition should be handled were found overall positive, regardless of actual practice and how the structure was concerning nutrition in the department. For instance there was a 90% positive attitude for screening the patients for nutritional risk, even
though only half of the nurses actually found it to be a general task undertaken in their department. Apparently the nurses considered nutrition screening as being important, even though many still found it difficult and some found identification of relevant patients a reason for not taking care of nutritional issues in their practice, as also reported by studies beforehand (20, 22). While 59% found that they had participated in education concerning nutrition, a convincing part of the nurses’ still find lack of knowledge to be one of the main barriers to not commonly take nutritional care into action. This is underlined by the fact, that knowledge and time since graduation are independent variables for a well defined structure, while education and type of hospital were not. As the Norwegian nurses were significantly younger, the good correlation between age, time of graduation and actual nutrition practise, could be one of more reasons, why Norwegian nurses tend to score the lowest in nutrition practise, regardless of speciality or organisational structure. The nursing education is however quite similar between the countries. Generally, participating in resent nutrition education was not significant for better nutrition practise. However, when data tells us that the nurses have recently participated in nutrition education, it does not tell, what level of nutrition teaching this was. One study has formerly indicated, that nursing staff with higher education, who also were the ones most interested in increasing their nutrition knowledge, also were the ones with the least close contact with the clients in primary health care (12). This could be a general problem in nursing care, if the well educated nurses are not somehow associated to clinical practise, either by taking care of nutrition practise close to the patient, in leadership or development positions.

Education by itself, was also found to be an independent factor for having a well-defined structure. Following, when the nurses in the present study wish to have more nutrition education, it is important that this leads to better knowledge, to ensure better nutrition care for the patients. Other implementation and intervention studies (3,13, 20) also imply, that teaching nutrition to
hospital staff does not alone improve the patients’ nutritional intake. The content of the nutrition education undertaken, could however call for further investigation. In the present questionnaire, no criteria’s for nutrition education was set up, which could possibly affect the fairly high frequency of the nurses that have had nutrition education within the last year, as well as the fact that education was a less independent factor, but knowledge was. The assumption could be made, that i.e. teaching nurses about the content of food items, could be considered nutrition education, but this will not be decisive in the nutrition process as recommended by ESPEN guidelines, and following not in the analysis done in this study.

More responders state that they have sufficient routine experience in the use of parenteral nutrition, opposed to the use of tube feeding. This, however vague difference, is underlined by the fact that 44% of the nurses are of the opinion that “patients’ resistance against having placed a tube is a barrier against introducing tube feeding” and that 32% of the nurses think that handling parenteral nutrition is easier for the staff than tube feeding. Only 12% evaluate that the risk of complications, can refrain the department from using parenteral nutrition. These statements call for further investigation, as the main recommendation verified by ESPEN Guidelines, still is, to use the gut for feeding, whenever possible, mainly due to risk of complications. The questions however, are designed in a way that nurse responders might answer to either tube-feeding OR parenteral nutrition, which is far from the tendency in clinical practice today.

Within the specialities, as well as within the countries, a great variation of w-DS and p-DS was seen. In Denmark, the National Board of Health has for several years, had specific guidelines for nutrition, with the same content as those of ESPEN, as opposed to Norway and Sweden. Resources have been prioritised in the implementation of these guidelines. The tradition in Sweden has been more that of research within nutrition. The nurses in Sweden were older and
more experienced, which also was an independent factor for better nutrition practice, whereas the Norwegian nurses were younger. Furthermore, Norway does not have the quite same nutrition tradition, or the support form National Guidelines. The differences between the w-DS and p-DS amongst the specialities does not have any obvious explanations, other than surgical and medical gastroenterology as well as oncology, are departments where nutritional problems are common. Intensive care and anaesthesiology are analysed together, which can influence the low w-DS in these departments, as nutrition strategy is most often not taken care of during anaesthesia.

A remarkable difference was found between the nurses` ambitions for nutritional care practice and the practice that in general takes place. The nurses show, that they want to improve practice. However, ambitions do not quite lead to actions. As seen in this study as well as in the formerly mentioned intervention studies, barriers to taking nutritional aspects into action are supplemented by many other things. Lassen (22), describes that some of the nurses find serving meals to the patients a service task, which implies that these tasks are “under level” of the registered nurse. The author questions this, on the argument, that in the recommendations of the International Council of Nurses (ICN) (25), the dimension of the patients’ nutritional status as in “helping the patients to eat and drink” is placed as second after the patients’ ability to breathe. In Lassen’s study however, there seems to be a utilisation of nutritional care into selected tasks, which leaves behind the understanding of the whole nutrition process that may be the reason for this attitude. Some of the nurses in Lassen’s study however, show great understanding to the process. These are the nurses that work in the department with the least staff-turnover, and where the head-nurse has committed her self to the project, and made room for implementation. Rasmussen (20) showed that certain items were basic for implementing nutrition strategy in clinical practise. Amongst these were pre-measurements in order to enlighten the need for a strategy, leadership and identification and handling of barriers. The ability to handle implementation strategy and provide structure for
nutrition is however not an ordinary task for health-care personnel in either of the countries, but sort within the tasks of the leader, where it is also extremely important, as shown by Lassen (22). In the present study however, nurses claim their professionalism towards the nutrition process. In general the nurses in the present study are very keen on providing quality for the patients throughout the entire nutrition process. The questions in the questionnaire are served in the natural consecutive process, which is also typical for ESPEN guidelines. There are no selected questions to delegated tasks of actually serving meals, as these are incorporated in the nutritional care process for the patient as such. Therefore it is not possible to directly discuss the findings of Lassen (22) where some nurses find it a service matter to care for the patients nutritional needs. It could be very interesting to know more about the level of structure, hereby leadership for nutrition matters, in departments where this attitude is present among the nurses.

However good intentions, nursing care has its limits in nurses’ knowledge and experience or “expertise” and obviously, to the care surroundings, based on the organizational structure.

In the present study, the discrepancy between wishing for and doing in practice, were minimized remarkably, when the settings were divided in those with a well-defined structure, versus those with a poor-defined structure. There was still in all terms of nutritional guidelines some distance to what the nurses in the present study had as their “ambitions” for nutritional practice and to the practice they provided in daily life in their departments. However, data indicate that it is easier for the nurses to fulfil their ambitions towards the nutritional care, if the organisation for preventing and treating undernutrition, is set up according to recommendations by the ESPEN Guidelines. Only half of the nurses departments met the standard for having a well-defined structure, even if only three out of five organization structure markers needed to be met. The three out of five structure markers is a pragmatic cut off. The idealistic goal obviously, is a department where all criteria’s are met. However more than half (three out of five), is chosen in order to present positive attitude to
departments in development regarding nutrition, as professional experience shows that the first steps of development are the hardest obtainable. The analysis shows that some items are more often met in the definition than others. Whether a department that meets all the recommended standards for organisation structure is better qualified for nutrition practise is of course likely, but calls for further investigation, along with the investigation of whether one of the structure markers is more important than others. One can only assume that the discrepancy between the nurses` wishes for actual practice would be easier met if five out of the structural markers were fulfilled, and the capacity for dealing with nutritional problems following is improved. However, whether a better organizational structure per se leads to better care, or whether nurses who are better educated and more interested concerning nutritional care are able to implement well-defined structures more easily, remains open.

Conclusion

- The responding nurses had a very positive self reported attitude towards nutrition aspects, but a large discrepancy was seen between the nurses` attitudes and actual practice..

- Nurses working in departments with a well defined organisational structure concerning the capacity for dealing with nutritional problems as recommended by ESPEN Guidelines, have better self-reported practise, than nurses working in departments with a less defined structure for nutrition.

- Knowledge and experience seems to be independent factors for having a good nutritional structure.

- The nurses found barriers for dealing with clinical nutrition to be; lack of knowledge, techniques and education. The data however implies that the organisation structure around nutrition in the departments is a dependent factor for undertaking nutrition in practice.
Nutrition education for nurses needs to be considered in terms of content, in order to evaluate the meaning of nutrition education to actual nutrition care.

**Relevance to clinical practice**

This study shows that a well defined structure for dealing with nutrition matters is particularly recommendable. Politicians, hospital owners, leaders of nursing staff and hospital departments – cannot overlook these arguments to develop an organizational structure that underlies the impact of structure in implementing and sustaining nutritional therapy in the care for hospitalised patients.

**Contributions**

Mette Holst contributed with idea for the article, selecting data and data analysis, and the writing of the manuscript.

Mitra Unesson contributed to the idea, and data analysis, and supervised the manuscript writing process and tables.

Henrik H Rasmussen contributed to idea, and data analysis, and supervised the manuscript writing process and tables.

The SNG group designed the first and second questionnaire.

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References


