Computer based training in eating and nutrition facilitates person-centered hospital care: A group concept mapping study

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ABSTRACT
Studies have shown that a computer based training in eating and nutrition for hospital nursing staff increased the likelihood for patients at undernutrition risk to receive nutritional interventions. This paper aims to gain an understanding of conceptually important areas for a computer based nutritional training and their relative importance for the nutritional care, from the nursing staff's perspective following completion of the training. We used Group Concept Mapping (GCM), an integrated qualitative and quantitative methodology, to conceptualize important factors relating to the training experiences through four focus groups (n=43), statement sorting (n=38) and importance rating (n=32), followed by multidimensional scaling and cluster analysis. Sorting of 38 statements yielded four clusters. These clusters (number (n) of statements) were: personal competence and development (n=10); practice close care development (n=10); patient safety (n=9); and awareness about the nutrition care process (n=9). First and second clusters represented “the learning organization”, and third and fourth represented “quality improvement”. These findings provide a conceptual basis for the understanding of the importance of training in eating and nutrition, which by means of contributing to a learning organization and quality improvement, can be linked to and facilitates person-centered nutritional care and patient safety.

Key words: Education; Group Concept Mapping; Health informatics; Intervention; Nutritional treatment; Patient safety; Person-centered care; Undernutrition
INTRODUCTION

About 30% of hospital inpatients in Sweden suffer from undernutrition (UN) or UN risk\(^1\)\(^2\) and in a study from 12 countries the overall prevalence of UN in hospital settings was 39%\(^3\). Factors associated with UN risk are, e.g., comorbidity, multipharmacy, low functional status, depressed mood, and tiredness\(^4\)\(^-\)\(^10\).

The nutrition care process, from a dietetic perspective, includes four related steps: nutrition assessment, diagnosis, intervention, monitoring and evaluation\(^11\). In this process, registered nurses and nurse assistants are essential in the multi-professional team for initial detection of UN risk through screening, for implementing interventions, and for monitoring as well as follow-up. There are several tools available to screen for UN risk\(^12\)\(^-\)\(^15\). After screening for UN risk there is a need for appropriate interventions. Initiatives are needed to minimize the gap between screening and individualized interventions. To bridge this gap we developed, implemented and evaluated a computer based training in eating and nutrition (CBTEN)\(^16\)\(^,\)\(^17\).

The CBTEN was developed by a multiprofessional team. The CBTEN comprises education about the nutritional care process from a nursing perspective, how to conduct nutritional screening and connects screening outcome with appropriate nutritional interventions, monitoring, and follow-up. After implementation of the CBTEN among nursing staff in one hospital the proportion of patients at UN risk that received energy-dense food and dietician consultations increased, without causing overtreatment among patients at no UN risk\(^16\). This result was sustained and enhanced in a longer-term study\(^17\).

Most implementation studies infer success by measuring clinical outcomes such as adherence to guidelines and patient health. However, evaluations of conceptual aspects merit attention as well\(^18\)\(^,\)\(^19\). Implementation outcomes, as perceived by the involved staff, are of importance for attaining subsequent changes in clinical outcomes\(^18\). This is of importance also for understanding the implementation’s usefulness for communicating strategies to other settings.

Here we describe a study of the CBTEN from a conceptual perspective using Group Concept Mapping (GCM). GCM is a method that organizes and represent ideas from a specific group\(^20\). GCM integrates qualitative individual and group processes with multivariate statistical analyses\(^21\). This paper aims to gain an understanding of conceptually important areas for a nutritional training and their relative importance for the nutritional care, from the nursing staff’s perspective following completion of the CBTEN.

METHODS AND PARTICIPANTS

**Ethics**

The study was approved by the local research ethics committee and was conducted in accordance with the Declaration of Helsinki. All participants gave written informed consent following oral and written study information.

**The CBTEN**

The CBTEN was developed by two registered dieticians, three registered nurses, one user-centered design specialist, and one public health educator. The group also involved one innovation officer and two persons working with Information computer technology. The CBTEN comprises five sections in the following order: 1) Introduction to nutrition (e.g., causes and consequences of undernutrition; nutrients; energy needs calculator); 2) Screening for UN risk (exemplified using the Minimal Eating Observation and Nutrition Form, MEONF-II\(^22\)\(^,\)\(^23\); BMI calculator for amputees; eating difficulties, instruction video for nutrition screening, etc.); 3) Nutritional interventions and monitoring (e.g., monitoring beverage and food intake; different types and consistencies of food; oral health; eating aids); 4) interactive case reports where participants are asked to read the case, complete the MEONF-II, suggest
actions and then compare their results with those of an experienced assessor; and 5) a quiz. The program takes about 50 to 60 minutes to complete and is available at www.dunat.se (in Swedish only). More detailed information on the CBTEN is available elsewhere.

The CBTEN was implemented and tested at a 200-bed hospital in south Sweden. During a period of three months all nurse assistants and registered nurses at the included wards were offered the training, to be completed at a time of their choice during working hours. Wards included were: ear-nose and throat; gastroenterology; gynecology and breast; endocrinology; hematology; cardiology; surgery; pulmonary; gerontology; orthopedic; neurology; and stroke. Wards not included were: pediatric; obstetric; intensive; and psychiatric wards. More detailed information on the CBTEN implementation is available elsewhere. A total of 297 (84% out of 354) nurse assistants and registered nurses completed the CBTEN. The most likely reason for the drop-out was lack of time.

Group Concept mapping
Group concept mapping (GCM) is conducted in several consecutive steps. First, statements are generated based on a focus prompt (brainstorming). Second, statements are sorted according to their perceived similarities. Third, statements are rated (typically regarding importance) relative to each other. While other and/or additional ratings may be used, this study only involved importance ratings. This is followed by integrated qualitative and quantitative data analyses.

Data collection was conducted in 2014 and comprised focus group based statement generation, and online computer based individual sorting and rating of statements by registered nurses and nurse assistants. Data collection, processing and analyses were conducted using Concept System® Global MAX™ (www.conceptsystems.com).

Procedure and participants
Statements were generated during four focus-group sessions, conducted at the hospital wards’ staffroom during day-time hours. Each focus-group session took between 40 and 50 minutes to complete. The sessions were led by one of the researchers and a second one took notes about the generated statements. The staff generated the statements based on the following focus prompt: "An important experience for my competence regarding nutritional assessments and interventions from the CBTEN is..." In total 43 persons participated in the focus groups (Table 1).

All statements were then reviewed by the authors. Duplicates and non-relevant statements were removed. The remaining statements were entered to the Concept System® Global MAX™ together with instructions for sorting and rating. E-mail invitations to all staff that had completed the CBTEN was sent with information about the study, and with a link to complete the sorting and rating task online. One reminder was sent.

The participants sorted statements into piles in a web-based interface according to their perceived conceptual similarities. They also gave each pile a name that described the content therein. Thirty-eight persons completed the sorting of statements (Table 1), which is considered an adequate sample size for this stage of the GCM process.

Following sorting of statements, participants were instructed to rate them with respect to their importance with respect to the focus prompt and relative to the other statements. The instruction for rating the statements was: Based on your experiences from the CBTEN, how...
important is each of these statements for your competence regarding nutritional assessments and interventions? Each statement was rated on a 1-5 scale (1 = relatively low importance; 5 = very important). This task was completed by 32 (84%) of the 38 persons who completed the sorting (Table 1).

**Analyses**
The relationships (distances) between statements were estimated using 2-dimensional, non-metric multidimensional scaling (MDS) analysis of the aggregated sort data. The focus groups generated a total of 241 statements. Saturation was reached early in the process and the last focus group did not produce any new statements. Statements were reviewed, duplicates and non-relevant statements were removed. This process resulted in a final set of 38 statements (Table 2). MDS analysis of sort data yielded a stress value of .024, indicating good fit between the aggregated sort data and the final map configuration.

**RESULTS**
The focus groups generated a total of 241 statements. Saturation was reached early in the process and the last focus group did not produce any new statements. Statements were reviewed, duplicates and non-relevant statements were removed. This process resulted in a final set of 38 statements (Table 2). MDS analysis of sort data yielded a stress value of .204, indicating good fit between the aggregated sort data and the final map configuration.
configural similarity was \( r = .72 \) and the \( R^2 = .52 \), indicating 52% shared variance. All three results were high compared to previously found estimates\(^\text{20}\), and collectively these indicators suggest high internal representational validity. Similarly, the sort reliability estimates in this study were consistent with previous GCM studies\(^\text{20}\) and taken together, indicated the output of the concept mapping process was reliable (\( r_{II} = .82; r_{IT} = .96; r_{SHT} = .84; r_{IM} = .93; r_{SHM} = .73 \)).

Following cluster analysis of the x-y coordinates, a solution with four clusters was considered the most interpretable, where each cluster represented a distinct area. The four clusters were: *Personal competence and development* (cluster 1), *practice close care development* (cluster 2), *patient safety* (cluster 3), and *awareness about the nutrition care process* (cluster 4).

-INSERT TABLE 2 ABOUT HERE-

Table 2 lists statements within the four clusters, their importance ratings, and BVs. Clusters 1 and 2 had 10 statements each, and clusters 3 and 4 had 9 statements each (Table 2). In each cluster the following “anchor” statements were identified (according to their low BVs): cluster 1, the training confirmed that we are doing the right things at the ward (BV 0.03); cluster 2, the training is needed both within hospital care as well as in municipality care and service (BV 0.00); cluster 3, be alerted to the patient’s nutritional needs (BV 0.10); and cluster 4, one should take action based on what’s found from the risk assessment (BV 0.21).

Figure 1 depicts the distances between all 38 statements with each point representing one statement (Fig. 1a), the four-cluster solution (Fig. 1b), the average importance ratings (Fig. 1c), and bridging values (Fig. 1d). Cluster sizes reflect the similarities between statements within clusters; larger clusters (e.g., cluster 4) are relatively heterogeneous, whereas smaller clusters (e.g., cluster 3) are relatively homogenous. Cluster 3 (patient safety) was rated as most important, as illustrated by having more cluster layers in the cluster rating map, followed by clusters 4, 2, and 1 (Fig. 1c). The cluster that had most in common with the other clusters was cluster 4 (awareness about the nutrition care process), as illustrated by more cluster layers in the cluster bridging map (Fig. 1d).

-INSERT FIGURE 1 ABOUT HERE-

Ordering of the highest rated clusters gives the following picture (Table 2; Fig 1c).

1. Patient safety (cluster 3, mean 4.21)
2. Awareness about the nutrition care process (cluster 4, mean 4.10)
3. Practice close care development (cluster 2, mean 4.03)
4. Personal competence and development (cluster 1, mean 3.97)

The cluster with the highest bridging value was *awareness about the nutrition care process* (0.50). The higher bridging value for this cluster suggests that this group of statements, to a relatively high extent, also relate to statements in other clusters. Conversely, the other three clusters had lower bridging values and therefore appear more homogenous (Table 2; Fig 1d).

Hypothetical latent features of the map (Fig 1e) indicates that the clusters *Personal competence and development* (cluster 1) and *Practice close care development* (cluster 2) were located close to each other. The latent higher order meaning of these two was labelled “the learning organization”. In the same way the clusters *Patient safety* (cluster 3) and *Awareness about the nutrition care process* (cluster 4) were located close to each other. The latent higher order meaning of these two was labelled “quality improvement”.

DISCUSSION
This paper illustrates the benefit of using GCM as a tool for evaluation of educational interventions within clinical settings, in this study with focus on eating and nutrition. Specifically, GCM provides rich multidimensional information that informs the interpretation of complex data by revealing structure and order that can be used to motivate the implementation of clinical educational interventions such as the CBTEN also in other settings.

A major advantage with GCM is its integration of qualitative and quantitative methodologies. The use of a mixed-methods approach contributes to enhancing the understanding of conceptual aspects of the area under evaluation. Since GCM is highly participant-driven it ensures that the evaluation process is relevant to participants, which is less likely when evaluators use predefined questions. In GCM, participants themselves define what is important to them and as a group they are able to provide a fuller picture compared to that produced by traditional predefined evaluations. The risk with traditional evaluations of conceptual aspects of implementation is that the evaluators may overlook important aspects. GCM has similarities to traditional qualitative evaluations, but has the added advantages of time effectiveness as well as mapping aspects of content relative to other content.

The focus of this study was quite narrow, as also shown in the limited number of statements (n=38). In previous studies the mean number of statements were found to be slightly more than 96. Nevertheless, smaller number concept maps are not uncommon. Furthermore, the number of participants for the focus-groups (brainstorming of statements) seemed to be sufficient since the initial list of generated statements was fairly exhaustive and saturation was reached during the process. A large number of duplicate statements had to be removed, which was done in collaboration within the research group in order to limit this risk of information loss. As measured by multiple indicators of internal representational validity, the correspondence of the represented model to the original participant-structured input was strong, as was the reliability of the sort data. Collectively these results support an internally valid and reliable group concept mapping process.

There was a decreasing number participating between the focus-groups and the final GCM steps. However, the participants in the focus-groups are not necessarily the same as those in the subsequent GCM steps. The key issue in GCM is that participants should be representative of the target group (as was the case here), and that the group is of reasonable size. Evidence suggest that representative samples of 20-30 persons are sufficient in the sorting and rating task. Therefore, we do not consider our drop-out rate as a considerable threat to our results.

The four identified clusters (personal competence and development, practice close care development, awareness about the nutrition care process, and patient safety) are congruent with a framework for person-centered care including four constructs: prerequisites for nursing; the care environment; person-centered processes; and expected outcomes. These constructs are related. Although the clusters found in this study fit well with the framework for person-centered care, the clusters reflect relatively narrow spectra of the constructs in the person-centered care framework. For example, person-centered care also includes aspects such as satisfaction with care and involvement in care.

According to Rosas (2016) two main types of configured properties are evident in GCM, observable features (i.e. descriptive, manifest) and hypothetical unobservable features (i.e. latent). In this study, the latent features were labelled the learning organization and quality improvement.
The learning organization
The findings showed that the clusters Personal competence and development (cluster 1) and Practice close development (cluster 2) were located close to each other and both can be regarded as important for a learning organization. One implication of promoting person-centered care is that nursing staff continually need to update their competence through training and learning in order to satisfy individual patient needs as well as to ensure consistency of service provision\(^\text{31}\).

Personal competence and development - prerequisites
Personal competence and development is part of “the prerequisites” in the framework for person-centered nursing\(^\text{29}\). The CBTEN was found to meet a need for education and training among nursing staff. Previous studies also highlight training and education as a key theme for facilitating the nutritional care process\(^\text{32-38}\). In a previous study, implementation of action oriented study circles to improve nutrition was found to improve professional development, system performance, and patient outcome\(^\text{39-41}\). In this study, the CBTEN was found to be important for the staff to feel more confident in conducting UN screening and some felt that the training confirmed their skills and that they did the right things at the wards. Thus, the CBTEN facilitated personal competence and development, which are important aspects of providing person-centered nutritional care.

Practice close care development – the care environment
“The care environment” in person-centered care focuses on the context in which the care is delivered\(^\text{29}\), and can be linked to the cluster practice close care development. The care environment in the person-centered care framework includes: appropriate skills, shared decision-making systems, effective staff relationships, supportive organizational systems, power sharing, and potential for risk-taking and innovation\(^\text{29}\). Related aspects found in our study were statements such as “the training is close to practice” and “the training stimulates cooperation”. Disseminating and implementing evidence based nursing practice within the area of eating and nutrition is a complex and continuing issue. Research utilization requires educational as well as organizational efforts\(^\text{32}\) and should be a continuous process. Incorporating nutritional screening into routine clinical practice is one key to facilitate detection of people at UN risk\(^\text{37}\) and it has been suggested that new staff should get an introduction regarding screening practice\(^\text{36}\), as also confirmed in this study, i.e. “all new employees should take the training”. The CBTEN thus appears to facilitate practice close care development by for instance going through both risk assessments and interventions, thereby providing a common understanding of these tasks.

Quality improvement
The clusters Patient safety (cluster 3) and Awareness about the nutrition care process (cluster 4) were located close to each other and can be regarded as aspects of quality improvement.

Awareness about the nutrition care process – person-centered processes
“Person-centered processes” in the framework for person-centered nursing\(^\text{29}\) can be linked to the cluster awareness about the nutrition care process. Within the CBTEN the process was emphasized by means of highlighting that nutritional screening should be followed by further individual assessment, implementation of nutritional interventions, monitoring and follow-up. This is in agreement with the nutrition care process that includes: assessment, diagnosis, intervention, and monitoring and evaluation\(^\text{11}\). However, the focus in the CBTEN was on detection of nutritional risks rather than “nutrition diagnosis” since it can be questioned whether this is the responsibility of the nursing staff. There were several statements highlighting the nutritional care process such as: “it’s easy to assess and rectify” (UN risk), “one should take action based on what’s found from the risk assessment”, and “it is important to follow up the care plan”. If nutritional screening feeds directly into a well-defined care plan, nurses may be more likely to screen the patients\(^\text{32}\). This was a fact that also was
indicated in the cluster *patient safety*, e.g., by the statement "more nutritional assessments are done". Thus, the CBTEN appears to facilitate quality improvement by means of having an impact on the nutritional care process and patient safety.

**Patient safety – expected outcome**

In the person-centered care framework the construct “expected outcomes”, which represents the results of effective person-centered care, can be linked to the cluster *patient safety*. Nutrition is important for patient safety since UN has negative impacts on patients’ health as well as the health care system, leading to more complications, slowed recovery, and higher costs of care. It seems reasonable that all patients should get a screening of nutritional risk when admitted to hospital and their nutritional status should be monitored during their hospital stay and when necessary post discharge follow-up should be carried out. Patient safety was highlighted by statements such as that the training alerted the nurses to see the patient’s nutritional needs, to take actions against UN at an early stage, to contact the dietician at an early stage, and to make sure that the patients gets proper nutrition. To achieve patient safety, account must be taken to staffs’ personal competence, as well as to developments necessary to provide an effective nutrition care process. Patient’s safety is a central goal, which also was manifested by having the highest mean importance rating of all four clusters.

**Clinical implications**

To achieve a learning organization one needs to implement practice close care development by facilitating and updating the nursing staffs’ competence. To achieve quality improvement, from a nutritional perspective, the focus for the training and education should be on increasing the staffs’ awareness about how to carry out the nutrition care process. This is likely to ensure both consistency of care provision as well as person centred care. Following this, patient safety will be enhanced. One means to achieve this is to design the training in accordance with the nutritional care process, for instance by using an interactive computer based training, as was done here. Such training is flexible in that it can be taken whenever there is time.

**Conclusion**

By the use of GCM, a conceptual map of important aspects of a computer based training, and the competence in nutritional assessments and actions was defined. These findings provide a conceptual basis toward the understanding of the importance of training in eating and nutrition, which by means of contributing to a learning organization and quality improvement, facilitates person-centered nursing, nutritional care and patient safety.
REFERENCES


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Table 1. Participant characteristics in the different steps of Group Concept Mapping.

<table>
<thead>
<tr>
<th></th>
<th>Statement generation, n=43</th>
<th>Sorting of statements, n=38</th>
<th>Rating of statements, n=32</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Profession, n (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registered Nurses</td>
<td>19 (44)</td>
<td>16 (42)</td>
<td>13 (41)</td>
</tr>
<tr>
<td>Nurse Assistants</td>
<td>24 (56)</td>
<td>16 (42)</td>
<td>13 (41)</td>
</tr>
<tr>
<td>Researcher</td>
<td>0</td>
<td>6 (16)</td>
<td>6 (18)</td>
</tr>
<tr>
<td><strong>Age, median (min-max)</strong></td>
<td>47 (22-64)</td>
<td>43 (22-61)</td>
<td>41 (22-61)</td>
</tr>
<tr>
<td><strong>Women, n (%)</strong></td>
<td>41 (95)</td>
<td>32 (84)</td>
<td>26 (81)</td>
</tr>
<tr>
<td><strong>Years in current profession, median (min-max)</strong></td>
<td>*</td>
<td>12.5 (1-40)</td>
<td>11 (1-40)</td>
</tr>
<tr>
<td><strong>Setting, n (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>26 (60)</td>
<td>20 (53)</td>
<td>17 (53)</td>
</tr>
<tr>
<td>Surgical</td>
<td>17 (40)</td>
<td>9 (24)</td>
<td>7 (22)</td>
</tr>
</tbody>
</table>

*Not assessed
Table 2. Thirty-eight statements of important experiences from the computer based training in eating and nutrition for the respondents’ competence regarding nutritional assessment and actions, within four clusters.

<table>
<thead>
<tr>
<th>#</th>
<th>Clusters and statements</th>
<th>Importance</th>
<th>Bridging</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gain knowledge about different methods to take actions against undernutrition</td>
<td>4.36</td>
<td>0.11</td>
</tr>
<tr>
<td>7</td>
<td>The education is good for the wards’ competence</td>
<td>4.16</td>
<td>0.15</td>
</tr>
<tr>
<td>30</td>
<td>To see one’s own knowledge gaps</td>
<td>4.09</td>
<td>0.22</td>
</tr>
<tr>
<td>17</td>
<td>Get knowledge of different methods to assess the risk of undernutrition</td>
<td>4.07</td>
<td>0.50</td>
</tr>
<tr>
<td>9</td>
<td>One feel safer to carry out assessments</td>
<td>4.07</td>
<td>0.42</td>
</tr>
<tr>
<td>16</td>
<td>The training confirmed the skills I already had</td>
<td>3.98</td>
<td>0.15</td>
</tr>
<tr>
<td>5</td>
<td>The training confirmed that we are doing the right things at the ward</td>
<td>3.78</td>
<td>0.03</td>
</tr>
<tr>
<td>15</td>
<td>The training updated my knowledge</td>
<td>3.73</td>
<td>0.22</td>
</tr>
<tr>
<td>23</td>
<td>The training stimulates development</td>
<td>3.73</td>
<td>0.04</td>
</tr>
<tr>
<td>21</td>
<td>The training raises new thoughts</td>
<td>3.66</td>
<td>0.07</td>
</tr>
<tr>
<td>4</td>
<td>The training is needed both within hospital care as well as in municipality care and service</td>
<td>4.47</td>
<td>0.25</td>
</tr>
<tr>
<td>25</td>
<td>All professionals should take the training (physicians, registered nurses, assistant nurses, and students)</td>
<td>4.47</td>
<td>0.05</td>
</tr>
<tr>
<td>14</td>
<td>The training is needed in municipality care and service</td>
<td>4.42</td>
<td>0.03</td>
</tr>
<tr>
<td>8</td>
<td>The training is needed both within hospital care as well as in municipality care and service</td>
<td>4.40</td>
<td>0.00</td>
</tr>
<tr>
<td>12</td>
<td>The training goes through both risk assessment and action</td>
<td>4.11</td>
<td>0.06</td>
</tr>
<tr>
<td>6</td>
<td>The training provides a common understanding of assessment and action</td>
<td>4.04</td>
<td>0.02</td>
</tr>
<tr>
<td>13</td>
<td>The training needs to be followed up jointly in the ward afterwards</td>
<td>3.89</td>
<td>0.08</td>
</tr>
<tr>
<td>32</td>
<td>The training is close to practice</td>
<td>3.82</td>
<td>0.41</td>
</tr>
<tr>
<td>36</td>
<td>The training stimulates cooperation</td>
<td>3.72</td>
<td>0.02</td>
</tr>
<tr>
<td>3</td>
<td>Certificate in nutrition had been good</td>
<td>3.47</td>
<td>0.43</td>
</tr>
<tr>
<td>28</td>
<td>Take actions against undernutrition at an early stage</td>
<td>4.53</td>
<td>0.11</td>
</tr>
<tr>
<td>11</td>
<td>Make sure that the patient gets the proper nutrition</td>
<td>4.44</td>
<td>0.13</td>
</tr>
<tr>
<td>4</td>
<td>See simple clinical signs of undernutrition</td>
<td>4.40</td>
<td>0.31</td>
</tr>
<tr>
<td>22</td>
<td>Be alerted to the patient’s nutritional needs</td>
<td>4.36</td>
<td>0.10</td>
</tr>
<tr>
<td>19</td>
<td>Assessing risk at an early stage</td>
<td>4.33</td>
<td>0.16</td>
</tr>
<tr>
<td>38</td>
<td>Contact the dietician at an early stage</td>
<td>4.04</td>
<td>0.11</td>
</tr>
<tr>
<td>18</td>
<td>It is important to document</td>
<td>4.02</td>
<td>0.31</td>
</tr>
<tr>
<td>34</td>
<td>Achieve good practice</td>
<td>3.98</td>
<td>0.24</td>
</tr>
<tr>
<td>33</td>
<td>More nutritional assessments are done</td>
<td>3.89</td>
<td>0.20</td>
</tr>
<tr>
<td>29</td>
<td>One should take action based on what’s found from the risk assessment</td>
<td>4.44</td>
<td>0.21</td>
</tr>
<tr>
<td>31</td>
<td>Nutrition is the key to health</td>
<td>4.42</td>
<td>0.72</td>
</tr>
<tr>
<td>20</td>
<td>It is important to follow up the care plan</td>
<td>4.20</td>
<td>0.23</td>
</tr>
<tr>
<td>10</td>
<td>Targeted resources and skills are needed towards the wards</td>
<td>4.20</td>
<td>0.22</td>
</tr>
<tr>
<td>24</td>
<td>View and pay attention to the individual in the context</td>
<td>4.13</td>
<td>0.38</td>
</tr>
<tr>
<td>37</td>
<td>What you see clinically is not always captured by the risk assessment</td>
<td>4.09</td>
<td>0.45</td>
</tr>
<tr>
<td>27</td>
<td>The patient cases are valuable</td>
<td>4.04</td>
<td>1.00</td>
</tr>
<tr>
<td>35</td>
<td>It’s easy to assess and rectify</td>
<td>3.89</td>
<td>1.00</td>
</tr>
<tr>
<td>26</td>
<td>Get support in prioritizing</td>
<td>3.67</td>
<td>0.29</td>
</tr>
</tbody>
</table>

Items are listed in descending order by their importance ratings within each cluster.

\( ^{a} \) Mean importance rating on a scale from 1 (=relatively low importance) to 5 (=very important) as rated by 32 people (13 registered nurses, 13 assistant nurses, and 6 from the project group). Bold values are mean ratings for statements within the respective cluster.

\( ^{b} \) Mean bridging values from sorting of statements by 38 people (16 registered nurses, 16 assistant nurses, and 6 from the project group). Bold values are mean bridging values for statements within the respective clusters. Bridging values (range, 0-1) denote the degree to which a statement has been sorted with statements within the same cluster (bridging values closer to 0) versus statements in other clusters (bridging value closer to 1).
**Figure 1.** The multidimensional scaling generated point map (a) represent the distances between the 38 statements (each point on the map represents one statement), the three cluster solution with statement numbers (b), clusters with their average importance ratings (c, more cluster layers = higher importance), clusters with their average bridging values (d, more cluster layers = higher bridging value), and hypothetical latent features of the map (e). Bottom panel lists the cluster labels according to their numbers in panels c and d.