

Klinisk Patientnära Forskning 19

Eating and Nutrition 2006 and 2007

at Sjúkrahúsid at Akureyri, Iceland, in cooperation with Kristianstad
University, Sweden

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The research team "Patient Focused Clinical Research" is located at Kristianstad University and performs research and development within the area of patient-safety.

Overall objective of the group:

To enhance patient security by focusing on prevalence of certain indicators such as pressure ulcers, malnutrition/eating difficulties, hospital hygiene and wound microbiology and ulcer-related pain.

To implement interventions and to measure the potential effects on prevalence and prevention of these interventions.



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Abstract

Objectives: Risk for malnutrition and implementation of preventive factors are indicators of quality of care. Data regarding prevalence of malnutrition and the frequency of eating difficulties as well as preventive actions were studied at Sjúkrahúsid at Akureyri at two occasions (2006 and 2007) using the point-prevalence technique.

Aim: To study the point prevalence of eating difficulties and risk for malnutrition as well as preventive actions taken for patients at risk for undernourishment.

Measurements: All of the patients admitted to the wards between 07.00 and 21.00 at the Sjúkrahúsid at Akureyri the 14th of March 2006 and the 23rd of April 2007, were assessed after having given consent. The instrument for data collection was translated into Icelandic and back-translated into Swedish. The patients' weight and height was measured and their knowledge about unintentional weight loss was recorded. The patients were observed while eating and asked about different types of eating difficulties. Risk of undernourishment was classified. Preventive nutritional actions were recorded.

Results: In total 107 patients (2006) 104 patients (2007) respectively were asked to participate and 95 versus 92 patients did take part (89% in 2006 and 88% in 2007). In total 17% and 14% of the patients had a low BMI. High BMI was found in 52% (2006) and 54% (2007) of the patients in the hospital. In the studies, 36% (2006) and 30% (2007) respectively of the patients had overweight and 16% (2006) respectively 20% (2007) of the patients were classified as obese. No patient was classified with severe obesity in 2006, whereas three patients showed severe obesity in 2007. BMI was found registered in the charts for one patient in 2006, and for 28 patients in 2007 (p-value <0.001). Unintentional weight loss was present in 20% (n=19) respectively 13% (n=12) (p-value 0.041) of the patients. In total 63% (n=60) in 2006 and 58% (n=53) in 2007 of the patients had different types of eating difficulties. In total 25% (n=24) versus 17% (n=16) (ns) of the patients showed some or high risk of undernourishment. The percentage of actions taken regarding eating and nutrition to meet risk of undernourishment had increased from 34% in 2006 to 47% in 2007 (not significant). The largest improvements were made by serving in between meals, consisting of food supplements or fruit, and by introducing an evening meal at 21.00, to shorten the night fast. The actions were not specifically for patients classified at risk of undernourishment, but rather for all patients.

Conclusion: The results of this study showed a lower risk of undernourishment and a similar status of overweight for patients at the Sjúkrahúsid at Akureyri at 2007 compared to 2006. Great improvements had been made to record BMI in the charts and to increase nutritional actions for all patients in 2007 compared to 2006. An ongoing use of the 5-point programme for nutrition and eating is recommended.

Key words: Eating difficulties, hospital, malnutrition, malnourishment, nutrition, overweight, prevalence, preventions, undernourishment, underweight

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The patients of Sjúkrahúsid at Akureyri can be congratulated to the excellent care and the openness for quality control and improvements as demonstrated by the management of the hospital and the staff.

For us as researchers coming from outside the hospital, we would finally like to forward our most sincere thanks to The Director of Nursing Ólína Torfadóttir for making this joint research project between the University of Kristianstad/Kristianstad General Hospital and Sjúkrahúsid at Akureyri possible. Her dedication to provide the best possible care for the patients, her openness for illumination of potential problems and her encouragement of the project has been invaluable. We also thank her for her great hospitality and friendship over the years.

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Background

A balance in nutritional status is important for health and well-being. To become elderly may imply difficulties to eat, especially when a person gets ill (Tierney, 1996). Difficulties to eat, often lead to a decrease in food intake and eventually to undernourishment (Westergren, Unosson, Ohlsson, Lorefalt, & Hallberg, 2002). Eating difficulties (i. e. difficulties to swallow) may lead to undernourishment, dehydration, and mistakes in swallowing leading to pulmonary infection and increased mortality.

Also the routines concerning food and food servings in institutions (such as hospitals) may influence the food-intake of patients (Sidenvall, 1995). Undernourishment increases the risk for complications such as infections, pressure ulcers and delayed wound healing, increased hospital stay and readmittance to hospital (Ek, Unosson, Larsson, Von Schenck, & Bjurulf, 1991). However, too high intake of food and energy leads to overweight, especially in combination with a sedentary life-style. Over weight may also lead to an increase in illness (Cornoni-Huntley et al., 1991). The consequences for the individual with an unbalanced nutritional status are often more suffering and higher costs of care. To identify eating problems and risk for malnutrition (undernourishment as well as overweight) is therefore important for all staff (Ulander, 1997).

In Swedish hospitals the mean prevalence of undernourishment is found to be around 31% and in sheltered housing the mean prevalence of undernourishment is found to be around 32% (Elmståhl, 2001). The older the patient is the greater risk of undernourishment (Tierney, 1996). Eating problems such as difficulties to swallow can be found in over 80% of certain populations in hospitals (Westergren et al., 2002).

To establish nutritional assessments in practice the Swedish National Specialist Board of physicians, registered nurses and registered dieticians recommended in 2004 that assessment of all patients is needed to identify patients at risk (SNUS, 2004). If two or more of the following criteria are present there is a risk for undernourishment and actions need to be taken:

- Unintentional weight loss (regardless of time and amount of weight loss).
- Eating difficulties (appetite, swallowing, loss of energy, moving disturbances etc).
- Low Body Mass Index (BMI) (weight (kg)/squared height (m²), with a risk if BMI <20 (69 years or younger) or BMI <22 (70 years or older).

Higher BMI values have shown to be more consistent with a smaller relative mortality risk in elderly persons, compared to young and middle-aged populations, so in this study "High BMI" has been defined according to these results (Heiat, Vaccarino, & Krumholz, 2001; Horani & Mooradian, 2002; Westergren, Lindholm, Axelsson, & Ulander, 2008). Definitions of high BMI:

Overweight: 25-29.9 (69 years or younger), 27-31.9 (70 years or older)

Obesity: 30-39.9 (69 years or younger), 32-41.9 (70 years or older)

Severe obesity: >40 (69 years or younger), >42 (70 years or older)

The frequencies of risk for malnutrition can be measured either as prevalence (the number of patients with risk at a given time) or as incidence (the number of patients developing a risk of malnutrition during at defined period).

The point prevalence method gives a picture of the total number of patients with risk for malnutrition at a given point in time, without answering the question of when the risk was developed. The method is suitable to obtain a baseline before interventions and as a method to follow up the effects of such interventions. The method is helpful for planning and monitoring optimal utilization of available resources. Point prevalence studies can be performed with relatively modest costs and includes total populations.

Rational for the study

Risk for malnutrition and implementation of preventive actions are indicators of quality of care. The decision was therefore taken by the management of the hospital to perform two point prevalence studies, one in 2006 and a follow-up study in 2007. The intention was to give feedback of the results to the wards, to discuss suggested preventive actions, to measure actions taken after the implementation of a 5-point program for eating and nutrition and to train the staff in assessing risk of malnutrition (Attachment 1).

Aim

To study the point prevalence of eating difficulties and risk for malnutrition as well as preventive actions taken for patients at risk for undernourishment.

Questions

What was the point prevalence of low and high BMI among patients at the hospital?

Was BMI measured and documented in the patient's charts?

What was the point prevalence of unintended weight loss and of eating difficulties?

What proportions of patients showed a risk of undernourishment?

How frequent were the preventive actions taken totally and in relation to patients with risk of undernourishment?

What were the differences in actions taken between the years studied?

Method

The study was carried out the 14th of March 2006 and the 23rd of April 2007. Prior to the study information was given to the management and to all departments at Sjúkrahúsid at Akureyri by the Director of Nursing (Ólína Torfadóttir).

A team of researchers at Kristianstad University, Sweden, have developed and tested in previous studies, a simple instrument for registration of patient-related risk factors for malnutrition, such as eating difficulties, and preventive actions. The scale for

eating difficulties developed by Westergren (Westergren et al., 2002) is included in this instrument. The instrument for data collection was translated into Icelandic and back-translated into Swedish. Two items were added – “not allowed to eat and nauseated”.

The technique of point-prevalence studies as a tool for measuring quality of care has been used by the research team in a number of studies (Lindholm, Torfadottir, Axelsson, & Ulander, 2007, 2008a, 2008b; Lindholm, Westergren, Axelsson, & Ulander, 2007a, 2007b; Lindholm, Westergren, Holmström, Axelsson, & Ulander, 2008; Ulander, Westergren, Torfadottir, Axelsson, & Lindholm, 2007; Westergren, Lindholm, Axelsson, & Ulander, 2007).

One registered nurse/ward was allocated to perform the data collection during one set day. The nurses were carefully instructed, and forms were test-filled in and questions were answered by representatives from Kristianstad University and by the Director of Nursing at Sjúkrahúsid at Akureyri. Written patient information was developed and given patients the day before the study. If the patient or his/her significant other gave oral informed consent, the patient was included in the study.

All of the patients admitted to the wards between 07.00 and 21.00 at the Sjúkrahúsid at Akureyri and having given consent, were assessed for eating difficulties and risk for malnutrition. Their weight and height was measured. The patients were observed while eating and asked about different types of eating difficulties and unintentional weight loss. BMI recorded in the patients’ charts was noted.

Preventive nutritional actions were recorded.

Internal loss of data was low (Table 1).

Table 1. Review of percent unanswered questions – internal loss.

Item	Percent internal loss 2006 (n=95)	Percent internal loss 2007 (n=92)
Gender	0	0
Year of birth	0	1
Weight	0	0
Length	1	0
BMI	1	0
Unintended weight loss	0	1
Eating difficulties	1	2
Difficulties swallowing	4	1
Eating assistance	2	1
Type of food	2	1
Consistency of food	3	2
Consistency of drink	1	4
Size of portion	1	6

Statistical analysis

The Statistical Package for the Social Sciences (SPSS), version 15.0 was used to analyze data. Chi-Square test was used when data was at nominal-scale level to analyze statistical significant differences between the years studied. The significant level was set to 5%.

Results

In the year of 2006, 107 patients were asked to participate and 95 patients (89%) chose to participate. In the year of 2007, 104 patients were asked and 92 patients (88%) participated in the study. In 2006, 12 patients did not take part (11%) and in 2007, 12 patients did not take part (12%). See Table 2 for specified data from the different wards.

Table 2. Participating patients from each ward

Ward	2006 n	2006 (%)	2007 n	2007 (%)
H-deild surgery	8	57%	7	88%
L-I medicine	15	83%	16	80%
L-II medicine	7	100%	6	100%
Geriatric	19	100%	15	100%
O-deild orthoepedic	11	85%	14	88%
R -deild rehab/young	12	92%	15	75%
Sel nursing home	23	100%	19	100%
FSA Total	95	89%	92	88%

Females participating in the studies were 64% in 2006 respectively 60% in 2007.

The mean age of the participating patients in 2006 was found to be 69.2 (sd 19.4), whereas in 2007, their mean age was 68.4 (sd 18.8) (ns).

Table 3 shows the mean BMI of the participating patients in relation to gender and different wards. In Table 4, the classification of BMI for all participants is presented. No significant differences between the years in classification of BMI were found. A tendency of being older was recognized for patients with underweight, compared with patients being overweight (see Table 5). No significant differences between the years were found.

Table 3. Gender and BMI at the different wards

Ward	Year	Female Mean BMI	Male Mean BMI	Total Mean BMI
H-deild surgery	2006	24	25	25
	2007	35	29	31
O-deild ort	2006	27	31	28
	2007	25	28	26
L-I medicine	2006	29	27	28
	2007	28	26	27
L-II medicine	2006	27	31	28
	2007	31	23	29
R -deild(Rehab)	2006	26	28	26
	2007	33	29	31
O-deild	2006	28	23	26
	2007	26	26	26
Sel nursing home	2006	26	24	26
	2007	26	26	26
FSA Total	2006	27	26	27
	2007	28	27	28

Table 4. Classification of BMI of all participating patients

Classification of BMI	2006	2007
Underweight	17%	14%
Normal weight	31%	32%
Overweight	52%	54%
FSA Total	100%	100%

Table 5. Mean and median age and classification of BMI

Classification BMI	Year of study			
	2006 Age		2007 Age	
	Mean	Median	Mean	Median
Normal weight	70	74	73	77
Underweight	78	82	80	83
Overweight	72	73	67	73
Obesity	65	65	65	70
Severe obesity	.	.	49	53

Statistical significant improvements were found in the documentation of BMI in the patients' charts, as shown in Table 6.

Table 6. BMI documented in the patients' charts at each ward

Ward	BMI is documented in chart		P-value
	2006 n (%)	2007 n (%)	
H-deild surgery (2006 n=8, 2007 n=7)	0(0)	0(0)	---
L-I medicine (2006 n=15, 2007 n=16)	0(0)	7(44)	.004*
L-II medicine (2006 n=7, 2007 n=6)	1(14)	0(0)	0.335
Geriatric (2006 n=19, 2007 n=15)	0(0)	13(87)	.000*
O-deild orthoepedic (2006 n=11, 2007 n=14)	0(0)	0(0)	---
R -deild rehab/young (2006 n=12, 2007 n=15)	0(0)	8(53)	.003*
Sel nursing home (2006 n=23, 2007 n=19)	0(0)	0(0)	---
FSA Total (2006 n=95, 2007 n=92)	1(1)	28(30)	.000*

* Statistically significant (p-value <0,05)

Significantly less patients reported unintentional weight loss in year 2007 than in 2006 (p-value 0.041).

Table 7. Unintended weight loss for participating patients

Ward		Unintended weight loss n	Unintended Weight loss %
H-deild	2006	5	63%
	2007	1	14%
	P-value	0.057	
O-deild ort	2006	5	45%
	2007	1	7%
	P-value	.026*	
L-I medicine	2006	4	27%
	2007	6	38%
	P-value	0.519	
L-II medicine	2006	2	29%
	2007	2	33%
	P-value	0.489	
R -deild (Rehab)	2006	0	0%
	2007	0	0%
	P-value	---	
O-deild	2006	3	16%
	2007	1	7%
	P-value	0.412	
Sel nursing home	2006	0	0%
	2007	1	5%
	P-value	.023*	
FSA Total	2006	19	20%
	2007	12	13%
	P-value	0.041*	

* Statistically significant (p-value <0,05)

In the follow-up study of 2007, fewer patients were recorded having difficulties handling the food, particularly in the SEL ward. This affected the overall result for eating difficulties for the participating patients' in the hospital, but with no statistical significant differences (see Table 8).

Table 8. Eating difficulties for all participating patients

Eating difficulties of all patients (%)	2006 n=95	2007 n=92
Difficulties to open/close the mouth	3	1
Difficulties to swallow	14	12
Difficulties to handle food in the mouth	9	2
Difficulties to transport food to the mouth	22	14
Difficulties to handle food on the plate	26	13
Difficulties to chew	5	17
Not enough strength to eat	11	2
Fast/slow eating time	11	7
Difficulties to sit and eat	9	2
Eat less than 3/4 of food served	7	11
Does not want to eat	1	2
Nausea	16	7
Poor appetite	28	33

According to the classification of patients at risk of undernourishment, there were no statistical significant differences in patients at risk for undernourishment between the years studied (see Table 9).

Table 9. Patients at risk of undernourishment

Risk of undernourishment	2006 n (%)	2007 n (%)
No risk	23(26)	33(38)
Low risk	42(47)	39(44)
Moderate risk	21(24)	12(14)
High risk	3(3)	4(5)
Moderate or high risk	24 (27)	16 (18)

Nutritional actions were taken for an increased amount of patients in the study of 2007, although the difference was statistically significant for the H-deild (p-value 0.021) but not for the total wards (See table 10). The actions registered and presented in Table 10 were one or more of the following; assistance eating, protein and energy enriched food, food supplementation and an extra evening meal.

Table 10. Nutritional actions taken for all participating patients

Ward	2006 n(%)	2007 n(%)
H-deild surgery (2006 n=8, 2007 n=7)	1(13)	4(57)*
L-I medicine (2006 n=15, 2007 n=16)	3(20)	7(44)
L-II medicine (2006 n=7, 2007 n=6)	1(14)	1(17)
Geriatric (2006 n=19, 2007 n=15)	7(37)	5(33)
O-deild orthoepedic (2006 n=11, 2007 n=14)	1(9)	2(14)
R -deild rehab/young (2006 n=12, 2007 n=15)	1(8)	7(47)
Sel nursing home (2006 n=23, 2007 n=19)	18(78)	17(89)
FSA Total (2006 n=95, 2007 n=92)	32(34)	43(47)

* Statistically significant (p-value <0,05)

One of seven units did not serve food supplementation to any patient at the time of the point prevalence studies. In total seven patients in 2006 and 13 patients in 2007 got food with reduction of certain items such as salt, wheat, fat or milk.

In Table 11 the different nutritional actions taken are presented. There was a statistical difference in ordering small portions in between the years studied. In 2006, 39% of the patients got a small portion served, whereas in 2007 the amount decreased to 16% (p-value .007).

Table 11. Nutritional actions taken in detail

Actions taken concerning eating and food (%)	2006 n=95	2007 n=92
Actions taken	34	47
Needs assistance to eat	38	29
Protein- and/or energy enriched food	1	3
Change of consistency of food	21	26
Artificial nutrition	0	0
Served a small portion (approx 200kcal)	39	16
Served an enlarged portion (approx 600kcal)	5	5
Food supplementation	9	38

The nutritional actions registered in relation to the risk of undernourishment (low/moderate/high) identified for the participating patients are presented in Table 12 and in Figure 1. The percentage of patients at risk of undernourishment and with nutritional actions taken was 58% in the year of 2006, and 56% in 2007. The percentage of nutritional actions taken for all participating patients had increased from 34% (2006) to 47% (2007). No change was statistically significant.

Table 12. Patients at low/moderate/high risk of undernourishment and nutritional actions taken or not taken for them, and nutritional actions taken for participating patients without classified risk of undernourishment

Ward (No of answers)	Patients at risk n		Risk combined with actions n		Risk but no actions n		No risk but actions n	
	2006	2007	2006	2007	2006	2007	2006	2007
H-deild surgery (2006 n=8, 2007 n=7)	5	1	1	1	4	0	0	3
L-I medicine (2006 n=15, 2007 n=16)	2	4	1	1	1	3	2	5
L-II medicine (2006 n=7, 2007 n=6)	2	2	0	0	2	2	1	1
Geriatric (2006 n=19, 2007 n=15)	6	3	5	3	1	0	2	2
O-deild orthoepedic (2006 n=11, 2007 n=14)	2	2	0	0	2	2	1	2
R -deild rehab/young (2006 n=12, 2007 n=15)	1	0	1	0	0	0	0	7
Sel nursing home (2006 n=23, 2007 n=19)	6	4	6	4	0	0	12	12
FSA Total (2006 n=95, 2007 n=92)	24	16	14	9	10	7	18	32

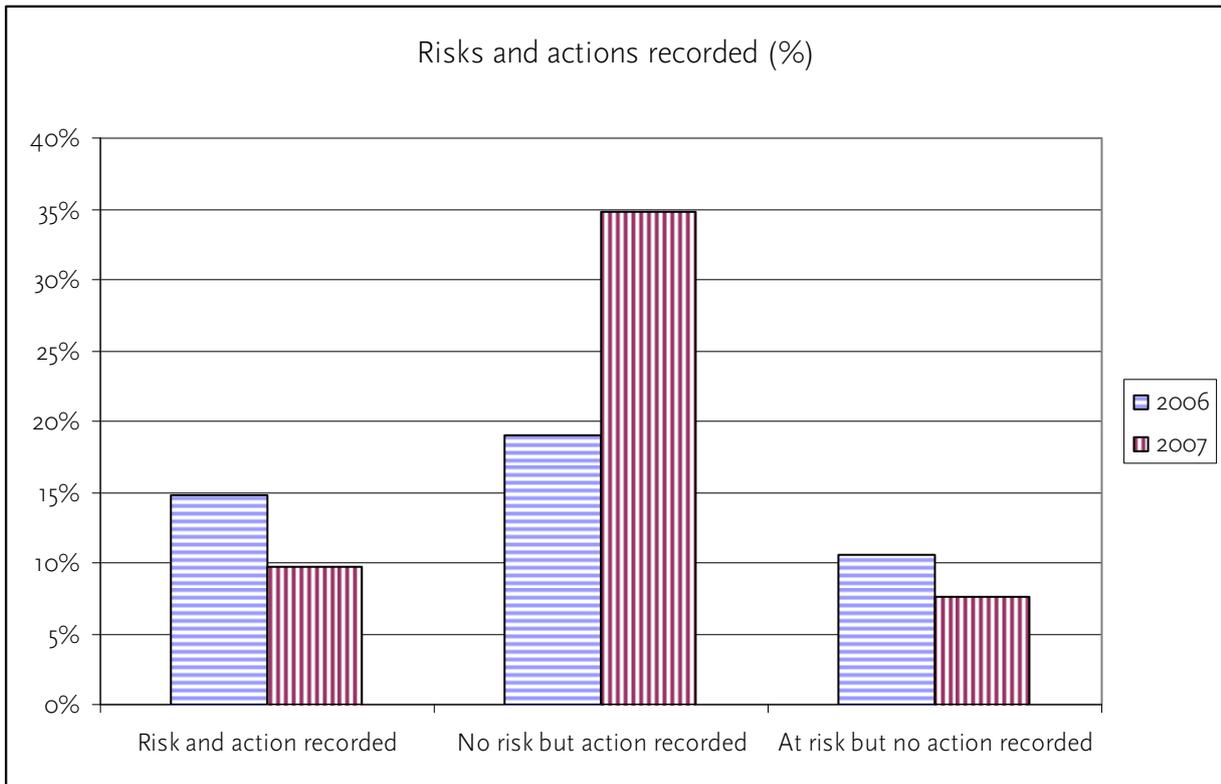


Figure 1. Patients at risk of undernourishment, or without risk of undernourishment, with or without nutritional actions recorded at all wards.

Table 13 shows the different types of food supplements and evening meals that were recorded at the different wards.

Table 13. Type of food supplements and evening meals recorded at the different wards

Ward (No of answers)	Type of food supplement	2006 n (%)	2007 n (%)
H-deild surgery (2006 n=8, 2007 n=7)	Energy drink	1 (13)	3 (43)
	None	7 (88)	4 (57)
L-I medicine (2006 n=15, 2007 n=16)	Energy drink	2 (13)	3 (19)
	Toast and juice	0	1 (6)
	Bread + Fruit	0	1 (6)
	None	13 (87)	11 (69)
L-II medicine (2006 n=7, 2007 n=6)	None	7 (100)	6 (100)
Geriatric (2006 n=19, 2007 n=15)	Energy drink	1 (5)	0
	None	18 (95)	15 (100)
O-deild orthoepedic (2006 n=11, 2007 n=14)	Energy drink	1 (9)	1 (7)
	None	10 (91)	13 (93)
R -deild rehab/young (2006 n=12, 2007 n=15)	Energy drink	1 (8)	0
	Fruit	0	6 (40)
	Chocolate energy bar + dried fruit	0	1 (7)
	None	11 (92)	8 (53)
Sel nursing home (2006 n=23, 2007 n=19)	Enteral nutrition, 1200 kcal/24	0	1 (5)
	Energy drink	3 (13)	0
	Extra meal (evening)	0	14 (74)
	Energy drink + extra meal (evening)	0	2 (11)
	Beer (evening)	0	1 (5)
	None	20 (87)	1 (5)

Discussion

Methodological considerations

One limitation was that the study was performed during one day (point prevalence study), but it is not likely that the results should have differed substantially with another technique. The rate of participation was high and the patients participating were similar in age and gender at the two occasions. The nutritional actions showed a variety between the two studied dates.

The data collection went on smoothly since the preparation and information was well performed. This resulted in carefully filled in forms with few missing data. All data collectors agreed that the information before the study was excellent and to collect the data they had enough support from the research team. They found the study meaningful.

Discussion of results

The results of this study showed fewer patients with underweight and with eating difficulties at the follow up compared to the baseline study. Unintentional weight loss had statistically significant lower prevalence in 2007. The risk of undernourishment had decreased in 2007 compared to 2006 (ns), and was quite lower in 2007 than found in Swedish studies (Elmståhl, 2001; Westergren et al., 2008)

A 5-point programme for nutrition and eating was implemented in October of 2006, and it may have influenced the point-prevalence of patients in risk of undernourishment. However, most likely the patient mix of the studied day explained the figure of patients at risk of undernourishment in 2007.

The implemented programme had led to great improvements in recordings of BMI in the patients' charts, showing an increased awareness among staff concerning nutritional assessment. Also the increase of nutritional actions for all patients in 2007 compared to 2006 showed that the introduction of the 5-point programme had been of value.

The largest improvements were made by serving in-between meals, consisting of food supplements or fruit, and by introducing an evening meal at 21.00-22.00, to shorten the night fast. These actions were not specifically for patients classified at risk of undernourishment, but rather for all patients.

The patient group with high BMI was larger than in southern Sweden (Westergren et al., 2008). This may have to do with differences in the patient mix and possibly by differences in precision by the weighing scales used. But it may also be a factor to take into account in a public health perspective. Depending on what type of care is given, educational programs on weight loss and increased physical activity might be appropriate, especially after the patient leaves the hospital.

An ongoing use of the 5-point programme for nutrition and eating is recommended, especially with the aim to act for patients at risk of undernourishment or overweight.

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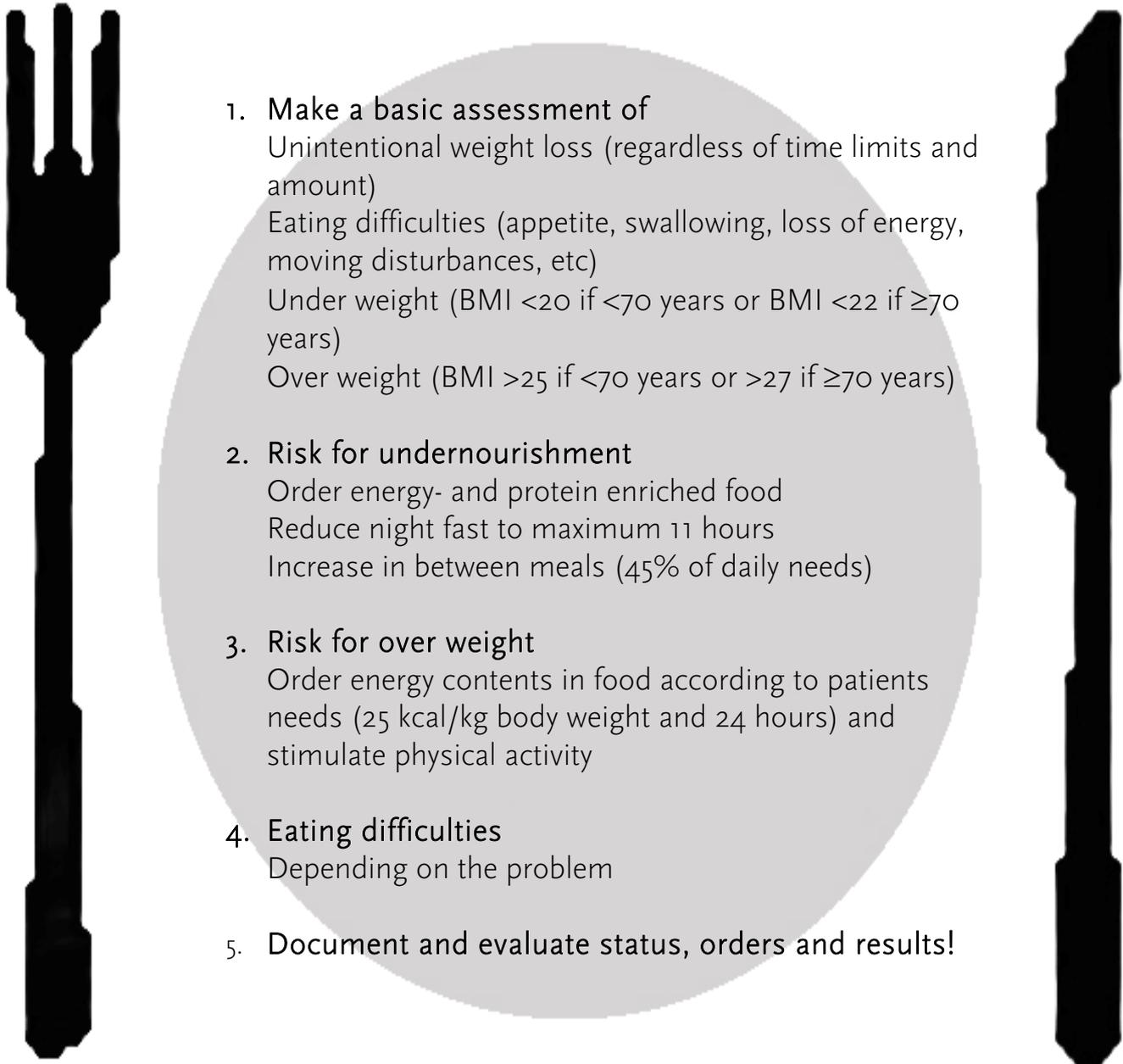
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Programme for nutrition and eating

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- 1. Make a basic assessment of**
 - Unintentional weight loss (regardless of time limits and amount)
 - Eating difficulties (appetite, swallowing, loss of energy, moving disturbances, etc)
 - Under weight (BMI <20 if <70 years or BMI <22 if ≥70 years)
 - Over weight (BMI >25 if <70 years or >27 if ≥70 years)
 - 2. Risk for undernourishment**
 - Order energy- and protein enriched food
 - Reduce night fast to maximum 11 hours
 - Increase in between meals (45% of daily needs)
 - 3. Risk for over weight**
 - Order energy contents in food according to patients needs (25 kcal/kg body weight and 24 hours) and stimulate physical activity
 - 4. Eating difficulties**
 - Depending on the problem
 - 5. Document and evaluate status, orders and results!**