



Malnutrition and nutritional care in an Icelandic teaching hospital

Topics

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Abstract

Background: About 30% of hospital inpatients are at undernutrition (UN) risk and it is important that sufficient nutritional treatment and care is provided in order to avoid a decline in health. **Aim:** To explore the prevalence of UN risk, the associations between UN-risk and other factors, and describe the nutritional treatment/care towards those at UN-risk at an Icelandic teaching hospital. An additional aim was to evaluate the user friendliness of a nutritional screening tool. **Methods:** Inpatients (n=56; median age 69 years; 29 women) were assessed by eight nurses using the Minimal Eating Observation and Nutrition form – version II (MEONF-II), a recently developed nursing nutritional screening tool. **Results:** In total 23% (n=13) were at moderate/high UN-risk. The prevalence of overweight/obesity was 57%. Among patients at UN-risk, 61% received energy dense food, oral nutritional supplements, and/or artificial nutrition; this figure was 35% among those at no/low risk. MEONF-II total scores correlated with dependency in activities of daily living (rs, 0.350), and UN-risk categories correlated with tiredness (rs, 0.426). The MEONF-II was regarded as easy to use and relevant. **Conclusion:** There is a need for interventions connecting the nutritional screening with individualised nutritional treatment and care in order to narrow the gap between screening and intervention. The Icelandic version of the MEONF-II is perceived as user-friendly.

Background

There is a need to narrow the gap between nutritional screening and individualised nutritional treatment and care.

Undernutrition (UN) is relatively common among hospital inpatients. For example, in a Swedish study 27% of screened hospital inpatients were found to have UN-risk (based on the criteria unintentional weight loss, low Body Mass Index, eating difficulties) [1]. Using the same methodology in Saudi-Arabia gave a prevalence of 39% with UN-risk [2]. Similar figures have been reported using other screening methods in the Netherlands (26%) [3] and in Spain (27%) [4]. UN-risk prevalence varies depending on type of hospitals and settings that are included. For instance, in a Swedish study including large (>500 beds), middle (200-500 beds), and small sized hospitals (<200 beds) the prevalence of UN-risk was 34%, 26% and 22%, respectively [5]. Factors found to be associated with UN-risk are, for example low functional status, comorbidity, multipharmacy, depressed mood, and tiredness/fatigue [6] [7] [8] [9] [10] [11] [12]. It is therefore important that sufficient nutritional treatment and care is provided in order to avoid a decline in health. However, it has been found that among hospital inpatients at UN-risk only 7-17% received Protein- and Energy Dense food (E-food), 43-54% got oral nutritional supplements, 8-22% got artificial nutrition, and 14-20% received eating assistance [5]. Eating assistance was provided to a greater extent and artificial feeding to a lesser extent in small compared to in middle and large sized hospitals [5].

The majority of these studies have used the Minimal Eating Observation and Nutrition form version II (MEONF-II) to screen for UN-risk. The MEONF-II is a tool developed to be used by nurses and is based on criteria for UN as well as eating difficulties [13] [14] [15]. In addition, the MEONF-II links screening results to suggestions for nutritional treatment and care. Although found to be useful and user friendly among Swedish nurses and student nurses [16] [17] [18] [19], it is unclear how it is perceived in other cultural settings.

In Iceland, the prevalence of UN-risk among hospital inpatients has been found to be 25% (in 2006) and 17% (in 2007) [20], of which only a minority of patients at UN-risk received E-food (12%) and oral nutritional supplements (37%) [20]. In that study, a five-point programme for nutrition and eating was implemented, including screening and actions to be taken for patients at UN-risk. The prevalence of overweight/obesity was 53% (in 2006) and 54% (in 2007) [20]. However, associations between UN-risk and other factors in Iceland have not been studied.

This study explored the prevalence of UN-risk, its associations with other factors, and nutritional treatment/care towards those at UN-risk at an Icelandic teaching hospital. In addition, the user friendliness of the Icelandic MEONF-II was assessed.

Methods

Data were collected in 2012 at a regional Icelandic teaching hospital [20] using a cross-sectional design. The study was conducted in accordance with the Declaration of Helsinki [21], and was approved by the local research ethics committee and the use of personal data from the study was notified to the Data Protection Authority.

Participants

Adult inpatients (≥ 18 years old) at four general adult hospital wards (surgery, general medicine, rehabilitation for young and old people) were eligible for inclusion. Fifty-six (76%) of 74 available inpatients gave informed consent to participate.

Instruments

The MEONF-II [16] [17] [18] was developed for use by nurses as it typically is nurses that conduct initial nutritional screening. The tool is based on recommendations for detecting UN-risk [13] [14] [15]. The MEONF-II includes assessments of unintentional weight loss, low BMI/short calf circumference, and eating difficulties. The included eating difficulties (food intake, chewing/swallowing, energy/appetite) are based on the Minimal Eating Observation Form – version II (MEOF-II) [22] [23]. An additional assessment of the presence of clinical signs of undernutrition is also included [17]. MEONF-II scores range from 0-8 (0-2 = no or low UN-risk; 3-4 = moderate UN-risk; ≥ 5 = high UN-risk) [18]. Studies have supported the reliability, validity and user friendliness of the MEONF-II among registered nurses and student nurses [16] [17] [18] [24] [25]. In this study, we used the Icelandic version of the MEONF-II [20] [24]. Overweight/obesity was graded based on BMI (≥ 25 if ≤ 69 years old; ≥ 27 if ≥ 70 years old) [1] [5].

Data regarding actions taken based on nutritional screening results were collected using a standardized protocol that has been used and continually improved throughout previous studies [2] [5] [20] [22] [26] [27]. The protocol comprises nutritional treatment (energy-dense food, oral nutritional supplements, and artificial nutrition). Energy-dense food is food that is smaller in volume than regular meals but has the same or higher content of protein and energy. Oral nutritional supplements include protein and energy drinks given in addition to and chiefly between main meals, but does not include pharmacological therapy or multivitamin and mineral pills [5]. Artificial nutrition includes enteral nutrition (via a nasogastric tube, gastrostomy or jejunostomy) and parenteral nutrition (via a peripheral or central vein), but not pre-/postoperative glucose or sodium chloride solutions. In addition, partial (e.g., buttering bread, cutting food) and total eating assistance is registered, as well as dietician consultation and nutritional assessments (estimation of energy needs and registration of food and fluid intake) [5].

Dependence in activities of daily living (ADL) was assessed using a modified Katz ADL-index [25] [28] that summarises an individual's overall dependency in six activities: hygiene; dressing and undressing; ability to go to the toilet; mobility; ability to control bowels and bladder; and food intake. Patients were then classified as mostly dependent (help in 5-6 activities), partly dependent (help in 3-4 activities), or mostly independent (help in 2 activities or less) [25]. Four patient-reported single-items were used to assess perceived disease severity (mild, moderate, or severe), perceived health (compared to others in about the same age; not as good as others, as good as others, better than others), tiredness and depressed mood (not at all, a little, quite a lot, a lot) [29] [30] [31] [32] [33] [25]. Demographic data (age, gender, diagnosis) were recorded and the nurses who made the screenings were asked about their perception of the MEONF-II, i.e. whether the tool was easy to understand, easy to score, and relevant [16]. In addition, nurses were asked to note the time taken to conduct the nutritional screening using the MEONF-II.

Data collection

Two registered nurses at each of the four participating wards ($n=8$) performed the data collection. Before commencing data collection, they received a brief training (45-60 minutes), including pre-testing of the forms.

Data collection was made under conditions as close as possible to clinical daily routine. Demographic data and data regarding nutritional treatment and care were taken from patients' medical records. Height and weight were measured using standard equipment available at the included units, and the patients were observed while eating and asked about eating difficulties and unintentional weight loss, and the four patient-reported single-items. Information regarding ADL was recorded based on the staff's knowledge about the patients' abilities and (when uncertain) by direct observations.

Data analysis

Descriptive and correlational analyses were conducted according to levels of measurement and distributional properties using Stata MP version 13.1.

Results

Medical	12
Surgical	23
Rehabilitation, young	8
Rehabilitation, older	13
Age, Mean (SD)	65.3 (18.9)
Median (q1-q3; min-max)	69.5 (54-82; 22-94)
Gender, women/men, n (%)	29 (52)/27 (48)
Help in Activities of Daily Living (ADL), n (%)	
Bathing	27 (48)
Dressing	21 (37)
Toilet	12 (21)
Mobility	16 (29)

A total of 56 (76%) out of 74 inpatients participated. The median age was 69 years and 29 patients were women. Most (66%) were dependent in 2 or fewer ADLs. The most common diagnostic categories were cardiovascular (29%) and orthopaedic diagnoses (25%). Half of the patients perceived their disease severity as severe and almost half (45%) thought that their health was not as good as that of others of

Continence	9 (16)
Eating	4 (7)
ADL-index, n (%)	
Mostly independent (0-2 activities)	37 (66)
Partly dependent (3-4 activities)	10 (18)
Mostly dependent (5-6 activities)	9 (16)
Common (>10 patients) diagnostic categories, n (%)	
Cardiovascular	16 (29)
Orthopaedic	14 (25)
Gastrointestinal	11 (20)
Pulmonary	11 (20)
Perceived disease severity, n (%) ^b	
Mild	5 (9)
Moderate	22 (41)
Severe	27 (50)
Perceived health (compared to others of the same age), n (%) ^c	
Not as good as others	24 (45)
As good as others	24 (45)
Better than others	5 (9)
Tiredness, n (%) ^a	
Not at all	24 (44)
A little	18 (33)
Quite a lot	7 (13)
A lot	6 (11)
Depressed mood, n (%) ^a	
Not at all	38 (69)
A little	8 (14)
Quite a lot	6 (11)
A lot	3 (5)

Table 1. Patient characteristics (n=56). ^a: missing data n=1; ^b: missing data n=2; ^c: missing data n=3.

the same age. Varying degrees of tiredness and depressed mood were reported by 56% and 31% of patients, respectively (Table 1).

Moderate or high UN risk was found among 23% of patients (Table 2). Observed frequencies of the various assessment items in the MEONF-II are reported in Table 2. Overweight/obesity was found among 57% of patients (Table 2).

Among patients at moderate/high UN-risk according to the MEONF-II (n=13), eight (61%) received some sort of nutritional intervention (energy dense food/oral nutritional supplements/enteral or parenteral nutrition), whereas 15 patients (35%) of those at no/low UN-risk received nutritional interventions. Detailed information about the types of nutritional interventions is provided in Table 3.

MEONF-II scores correlated with activities of daily living (rs, 0.350) and MEONF-II risk categories correlated with

tiredness (rs, 0.426 (Table 4).

User friendliness data were available in relation to 44 of the assessments. It took a median of 11 (min-max, 2-20) minutes to complete MEONF-II assessments. All assessors experienced the MEONF-II instructions as easy to understand, and regarded the items as easy to understand, easy to score, and relevant.

Discussion

The MEONF-II was experienced as a user-friendly tool among Icelandic nurses and identified about a quarter (23%) of hospital inpatients to have UN-risk, and this risk was associated with dependency in ADLs and tiredness. The majority of patients at UN-risk received nutritional treatment. In addition, more than half of patients were overweight/obese.

The UN-risk prevalence found here is similar to that found in the same hospital in 2006

	n=56
Unintentional weight loss, n (%)	8 (15)
Low Body Mass Index or Calf Circumference, n (%) ^a	7 (12)
Problem with food intake, n (%)	9 (16)
Sitting position	6 (11)
Manipulating food on the plate	5 (9)
Conveying food to the mouth	6 (11)
Problem with swallowing/mouth, n (%)	6 (11)
Chewing	4 (7)
Coping with food in the mouth	1 (2)
Swallowing	4 (7)
Problem with energy/appetite, n (%)	17 (30)
Eats less than ¼ of served food	15 (27)
Lacks energy to complete an entire meal	4 (7)
Poor appetite	9 (16)
Clinical signs indicate risk of undernutrition, n (%)	12 (21)
MEONF-II	
Total score, median (q1-q3; min-max)	1 (0-2; 0-6)
No/Low undernutrition risk, n (%)	43 (77)
Moderate undernutrition risk, n (%)	10 (18)
High undernutrition risk, n (%)	3 (5)
Overweight, n (%) ^b	
No overweight	22 (43)
Overweight	15 (30)
Obesity	12 (23)

(25%) but somewhat higher than in 2007 (17%) [20], and comparable to that in small and middle sized Swedish hospitals [5]. Also the prevalence of overweight/obesity was similar

Severe obesity	2 (4)
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Table 2. Undernutrition risk screening results from the Minimal Eating Observation and Nutrition Form (MEONF-II). ^a: BMI <20 kg/m² (69 years or below), BMI <22 kg/m² (70 years or older) OR calf circumference <31 centimetres. ^b: overweight: BMI 25–29 kg/m² (69 years or below), BMI 27–31 kg/m² (70 years or older); obesity: BMI 30–39 kg/m² (69 years or below), BMI 32–41 kg/m² (70 years or older); severe obesity: BMI >40 kg/m² (69 years or below), BMI >42 kg/m² (70 years or older).

	No risk (n=43)	Moderate/high risk (n=13)
Nutritional treatment		
Energy-dense food	0	1
Oral nutritional supplements	13	6
Artificial nutrition	3	2
Any nutritional treatment	15	8
Eating assistance		
Partial	1	4
Total	1	1
Any eating assistance	2	5
Dietician consultation	0	1
Nutritional assessment		
Energy needs estimated	0	1
Food intake registration	0	1
Fluid intake registration	7	0
Any nutritional assessment	7	1

Table 3. Correspondence between undernutrition risk and nutritional interventions. Each patient may have had more than one intervention.

nutritional treatment. In 2007, only two patients at risk received E-food and six had oral nutritional supplements (out of 16 patients at risk) [20]. While improved, there might still be a need for educational interventions to improve nutritional treatment and care. One such intervention is an one-hour computer based training in eating and nutrition that has been recently developed [33]. Preliminary findings show that this intervention can increase the

number of patients at UN-risk that receives energy-dense food and also the share of patients at risk that is offered dietician consultation without causing over-treatment (i.e. nutritional interventions for patients without UN-risk) [33].

It is concluded that about a quarter of Icelandic hospital inpatients appear to be at risk for UN and that this risk is associated with tiredness. There is a need for interventions that link nutritional screening to individualised nutritional treatment and care in order to narrow the gap between screening and intervention. The MEONF-II is perceived as a user-friendly nutritional screening tool among Icelandic hospital nurses and may serve as a means of bridging the gap between UN risk and UN interventions among hospital inpatients.

Declarations

Authors' contributions

All three authors have substantially contributed to the study. AW conceived and designed the study, carried out the analyses and drafted the manuscript. ÓT coordinated the data collection. PH and ÓT revised the manuscript and interpreted the data. All three authors gave final approval of the version to be published.

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to that found earlier among Icelandic hospital inpatients [20] but higher than that in Sweden [5]. Thus, the prevalence of UN-risk corresponds well to that found in other studies using similar screening methods but the overweight/obesity prevalence is higher. The reason for this is beyond the scope of this paper but our observations may suggest a need for public health initiatives to prevent overweight/obesity in Iceland.

The association between tiredness and UN-risk is in accordance with previous studies. For instance, among stroke survivors and elderly persons living at home, fatigue has been found to be associated with a higher risk for malnutrition [10] [12]. It is difficult to explain this relationship but a decreased energy intake may well cause fatigue and in turn a more sedentary life style with decreased perceived energy needs that further may worsen the sense of fatigue. It is likely that the interaction can work in both directions and that there is a risk that a vicious circle may develop.

Most patients (61%) at UN-risk received some

	MEONF-II total score		MEONF-II risk categories	
	Correlation coefficient (r _s)	P-value	Correlation coefficient (r _s)	P-value
Perceived disease severity	0.028	0.840	0.081	0.560
Perceived health (compared to others)	-0.007	0.962	-0.162	0.247
Tiredness	0.191	0.162	0.426	0.001
Depressed mood	0.065	0.637	0.229	0.093
Activities of daily living	0.350	0.008	0.198	0.143

Table 4. Spearman correlations between MEONF-II scores/risk categories and perceived disease severity, health, tiredness, depressed mood and activities of daily living.

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