AJCN. First published ahead of print March 9, 2016 as doi: 10.3945/ajcn.115.126615.

Undernutrition screening survey in 564,063 patients: patients with a positive undernutrition screening score stay in hospital 1.4 d longer[1]

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ABSTRACT

Background: Undernutrition is a common complication of disease and a major determinant of hospital stay outcome. Dutch hospitals are required to screen for undernutrition on the first day of admission.

Objective: We sought to determine the prevalence of the screening score "undernourished" with use of the Short Nutritional Assessment Questionnaire (SNAQ) or Malnutrition Universal Screening Tool (MUST) and its relation to length of hospital stay (LOS) in the general hospital population and per medical specialty.

Design: We conducted an observational cross-sectional study at 2 university, 3 teaching, and 8 general hospitals. All adult inpatients aged ≥18 y with an LOS of at least 1 d were included. Between 2007 and 2014, the SNAQ/MUST score, admitting medical specialty, LOS, age, and sex of each patient were extracted from the digital hospital chart system. Linear regression analysis with ln(LOS) as an outcome measure and SNAQ ≥3 points/MUST ≥2 points, sex, and age as determinant variables was used to test the relation between SNAQ/MUST score and LOS.

Results: In total, 564,063 patients were included (48% males and 52% females aged 62 ± 18 y). Of those, 74% (419,086) were screened with SNAQ and 26% (144,977) with MUST, and 13.7% (SNAQ) and 14.9% (MUST) of the patients were defined as being undernourished. Medical specialties with the highest percentage of the screening score of undernourished were geriatrics (38%), oncology (33%), gastroenterology (27%), and internal medicine (27%).

Patients who had an undernourished screening score had a higher LOS than did patients who did not (median 6.8 compared with 4.0 d; $P < 0.001$). Regression analysis showed that a positive SNAQ/MUST score was significantly associated with LOS [SNAQ: +1.43 d (95% CI: 1.42, 1.44 d), $P < 0.001$; MUST: +1.47 d (95% CI: 1.45, 1.49 d), $P < 0.001$].

Conclusions: This study provides benchmark data on the prevalence of undernutrition, including more than half a million patients. One out of 7 patients was scored as undernourished. For geriatrics, oncology, gastroenterology, and internal medicine, this ratio was even greater (1 out of 3–4). Hospital stay was 1.4 d longer among undernourished patients than among those who were well nourished.

Am J Clin Nutr doi: 10.3945/ajcn.115.126615.

Keywords: LOS, malnutrition, undernutrition, hospital, screening

INTRODUCTION

Undernutrition is a common complication of disease. Therefore, since 2007, Dutch hospitals have been required to screen for undernutrition within the first day of admission and use either the Short Nutritional Assessment Questionnaire (SNAQ)[12] or the Malnutrition Universal Screening Tool (MUST) as screening tools for undernutrition (1–4). Based on screening scores, patients are provided with additional nutritional interventions (4).

Nutritional intervention for undernourished patients is important because undernutrition has several clinical implications (2, 3, 5, 6). A low nutritional intake and BMI have been associated with pressure ulcers in hospital patients (5). In a Brazilian study of 709 adult patients from 25 Brazilian hospitals, a 163% higher mortality rate in undernourished patients than in well-nourished patients was observed. In addition, medical complications were found more often in undernourished patients, and hospital costs were higher for undernourished patients than for well-nourished patients (6). Undernourished patients also had a higher length of hospital stay (LOS) than did well-nourished patients: 16.7 compared with 10.1 d, respectively (6). Another Brazilian study showed a relation between nutritional status, defined as a BMI (in kg/m^2) <20, and a 2.1-times-longer LOS (7). These findings are supported by several studies that have clearly stated the high clinical and economical effects of undernutrition and the importance of undernutrition screening and thereby identified patients who need additional nutritional care (6–9).

These studies were performed in specific populations with a medium sample size. To really pinpoint the scale of undernutrition in hospital settings, prevalence and relation to LOS

[1] The authors reported no funding received for this study.

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[12] Abbreviations used: LOS, length of stay; MUST, Malnutrition Universal Screening Tool; SNAQ, Short Nutritional Assessment Questionnaire.

Received October 30, 2015. Accepted for publication February 9, 2016.
doi: 10.3945/ajcn.115.126615.

TABLE 1
Number of eligible patients admitted to each of the 13 participating hospitals per year and percentage of those eligible patients who were screened[1]

Hospital	2007	2008	2009	2010	2011	2012	2013	2014	Total eligible patients,[2] *n*	Total eligible patients when screening was >65%,[3] *n*
Bernhoven				1811 (56)[4]	14,366 (61)	13,907 (67)[5]	13,256 (71)[5]	13,445 (70)[5]	56,785	40,608
BovenIJ							6351 (81)[5]	6156 (85)[5]	12,507	12,507
Gemini		7249 (22)	7511 (30)	7574 (60)	7694 (71)[5]	7166 (68)[5]	6635 (79)[5]	6194 (78)[5]	50,023	27,689
Haga								14,185 (85)[5]	14,185	14,185
Maasstad		16,456 (53)	15,788 (64)	15,556 (80)[5]	16,222 (85)[5]	16,116 (88)[5]	15,908 (85)[5]	16,186 (85)[5]	112,232	79,988
Medical Center Alkmaar	20,601 (9)	19,606 (48)	16,926 (69)[5]	17,404 (83)[5]	17,763 (93)[5]	17,485 (95)[5]	17,043 (92)[5]	17,368 (76)[5]	144,196	103,989
St. Jansdal							10,932 (73)[5]	11,634 (80)[5]	22,566	22,566
Tweesteden					3859 (81)[5]	9923 (88)[5]	11,941 (92)[5]	12,503 (96)[5]	38,226	38,226
VU University Medical Center	9562 (14)	12,673 (43)	12,708 (68)[5]	12,429 (71)[5]	13,274 (69)[5]	13,459 (70)[5]	14,811 (76)[5]	12,647 (76)[5]	101,563	79,328
Erasmus University Medical Center				28,047 (15)	28,574 (37)	28,335 (47)	28,259 (62)	28,043 (70)[5]	141,258	28,043
Slingeland					13,939 (50)	15,638 (78)[5]	17,902 (89)[5]	18,058 (90)[5]	65,537	51,598
VieCuri Medical Center							13,432 (77)[5]	13,395 (78)[5]	26,827	26,827
Gelderse Vallei						12,561 (73)[5]	13,105 (85)[5]	12,843 (86)[5]	38,509	38,509

[1]Eligible patients were defined as those aged ≥18 y and with an LOS >1 d; 1-d admissions were excluded. LOS, length of stay.
[2]The total number of eligible patients in all years in all hospitals was 824,414.
[3]The total number of eligible patients in all years in all hospitals when >65% of the eligible patients were screened was 564,063.
[4]Number of eligible patients; percentage screened in parentheses (all such values).
[5]Percentage >65% and therefore the data are summed in the final column and used in all subsequent tables and figures.

TABLE 2
Characteristics of the SNAQ and MUST hospitals[1]

	SNAQ	MUST
n	419,086	144,977
Sex, %		
Male	48	48
Female	52	52
Age, y		
Mean ± SD	61.8 ± 18.1	62.3 ± 18.0
Median (IQR)	65 (26)	66 (25)
>70, %	39	41
Screened, %	80	80
SNAQ ≥3/MUST ≥2, %	13.7	14.9
SNAQ = 2/MUST = 1, %	3.9	10.0
LOS, d		
Mean ± SD	6.4 ± 8.8	6.1 ± 8.0
Median (IQR)	4 (5)	4 (5)
Hospital type, *n* (%)		
Peripheral	155,781 (37)	90,107 (62)
Teaching	183,977 (44)	26,827 (19)
University	79,328 (19)	28,043 (19)

[1]LOS, length of stay; MUST, Malnutrition Universal Screening Tool; SNAQ, Short Nutritional Assessment Questionnaire.

should be measured in a very large and general population and separated by specialty. Because Dutch hospitals are required to screen for undernutrition within the first day of admission, the digital hospital chart system contains the results of the screening scores and length of hospital stay. With the 2007–2014 data from the 13 hospitals this system provided, 2 questions could be answered: *1*) the percentage of patients with a screening score of undernourished in the general hospital population and per medical specialty and *2*) the relation between LOS and SNAQ/MUST scores.

METHODS

Study design

The Dutch Association of Dietitians and the Dutch Malnutrition Steering Group asked all Dutch hospitals (n = 103) to participate in this observational, cross-sectional study. Of these, 13 agreed. These hospitals used either SNAQ or MUST as a screening tool for undernutrition (1, 2). The hospitals that used SNAQ were Bernhoven, BovenIJ, Gemini, Haga, Maasstad, Medisch Centrum, Sint Jansdal, Tweesteden, and Vrije University Medical Center; the hospitals that used MUST were Erasmus Medical Center, Gelderse Vallei, Slingeland, and VieCuri Medical Center.

Data collection

All hospitals included in the study were asked to provide data that were available from the digital hospital chart system. Patients aged ≥18 y and with an LOS >1 d were included; 1-d admissions were excluded. The following data were used: year of admission, sex, age, SNAQ/MUST score, admitting medical specialty,

TABLE 3
Screening results per medical specialty and percentage screened patients per medical specialty[1]

Specialty	SNAQ ≥3 points, %	Percentage screened	MUST ≥2 points, %	Percentage screened
Geriatrics (4789; 1272)	38	92	31	80
Oncology (6258; 2336)	33	78	14	91
Internal medicine (59,671; 20,196)	27	86	26	86
Gastroenterology (16,634; 9133)	27	90	28	86
Hematology (2903; 1134)	24	50	13	90
Psychiatry (1754; 451)	24	30	15	88
Lung diseases (39,790; 14,586)	21	88	29	82
Nephrology (1855; 0)	18	76	—	—
Rheumatology (2182; 192)	16	88	12	89
ENT surgery (7244; 4320)	13	67	8	67
Dermatology (235; 208)	11	87	8	84
Surgery (79,612; 28,757)	10	87	11	85
Anesthesiology (777; 29)	10	87	0	69
Neurology (29,323; 11,262)	9	92	9	88
Vascular surgery (3150; 0)	8	79	—	—
Urology (22,193; 6995)	7	81	7	85
Cardiology (54,476; 18,994)	7	71	9	75
Traumatology (4402; 0)	6	78	—	—
Oral surgery (1106; 857)	6	81	8	84
Gynecology (30,094; 8799)	6	40	6	36
Neurosurgery (10,958; 1308)	5	87	7	83
Cardiac surgery (3452; 0)	5	68	—	—
Oral diseases (1506; 0)	4	74	—	—
Orthopedics (25,946; 10,977)	3	87	4	86
Ophthalmology (2017; 182)	2	43	5	93
Plastic surgery (5909; 1883)	2	83	5	77
Nuclear medicine (447; 562)	NA	0	12	16

[1]Values listed in parentheses after each medical specialty indicate the sample size of both groups (SNAQ; MUST). ENT, ear, nose, and throat; MUST, Malnutrition Universal Screening Tool; NA, data not available; SNAQ, Short Nutritional Assessment Questionnaire.

and LOS. To prevent selection bias, we decided to use data if >65% of all patients were screened for undernutrition per hospital per year. The SNAQ score consists of 0, 1, 2, or ≥3 points. Patients with a SNAQ score of 0 or 1 are categorized as well nourished, a score of 2 refers to moderate undernutrition, and a score of ≥3 indicates severe undernutrition (1). A MUST score of 0 refers to low risk for undernutrition, a score of 1 indicates moderate risk for undernutrition, and a score of ≥2 refers to high risk for undernutrition (2).

Data analysis

The undernourished screening score prevalence was analyzed with use of descriptive statistics. The SNAQ and MUST scores were analyzed for all patients and stratified per medical specialty. LOS was skewed to the right. Therefore, natural logarithmic transformation was performed to normalize the distribution [ln (LOS)]. Linear regression analysis with ln(LOS) as an outcome measure and SNAQ ≥3/MUST ≥2, sex, and age as determinant variables was used to test the relation between SNAQ/MUST scores and LOS. Age and sex were added as possible confounders. Data were analyzed with use of SPSS version 22 (IBM).

RESULTS

The participating hospitals extracted the information of 811,997 patients from their hospital chart systems. Only the data of the years with a percentage of screened patients >65% per hospital were included. This resulted in a total of 564,063 patients: 419,086 (74%) screened with SNAQ and 144,977 (26%) with MUST (**Table 1**).

Table 2 shows the characteristics of the included patients. The median age was 65 y (SNAQ) and 66 y (MUST). The percentage of screened patients was 80%. Results combined for all hospitals together showed that 13.7% of the patients had a SNAQ score ≥3, and 14.9% of the patients had a MUST score ≥2.

Table 3 and **Figure 1** provide the SNAQ/MUST scores per medical specialty and the percentage of screened patients per medical specialty. For both the SNAQ and MUST hospitals, geriatrics was the medial specialty with the highest percentage of undernourished patients. In the SNAQ group, oncology, internal medicine, and gastroenterology were specialties with a prevalence >25%; those in the MUST group were lung diseases, gastroenterology, and internal medicine.

Table 4 shows the number of patients, age, sex, and LOS divided by the undernutrition screening results undernourished, not undernourished, and missing screening result. The group of patients without a screening result were younger, included more females, and had a lower LOS. Patients with a screening score of undernourished were more often female (SNAQ: $P = 0.002$; MUST: $P < 0.001$), were younger ($P < 0.001$), and had a higher LOS [median 6.8 d (SNAQ) and 6.6 d (MUST) than patients with the screening result not undernourished [median 4.0 d (SNAQ and MUST) ($P < 0.001$)]. Regression analysis, adjusted for age and sex, indicated that SNAQ/MUST score is a significant determinant of LOS [SNAQ: +1.43 (95% CI: 1.42, 1.44), $P < 0.001$; MUST: +1.47 (95% CI: 1.45, 1.49), $P < 0.001$].

LOS of undernourished patients was longer than for patients who were not. The results are shown per medical specialty in **Table 5**. In dermatologic and hematologic patients, there was no difference in LOS based on the undernutrition screening score. In

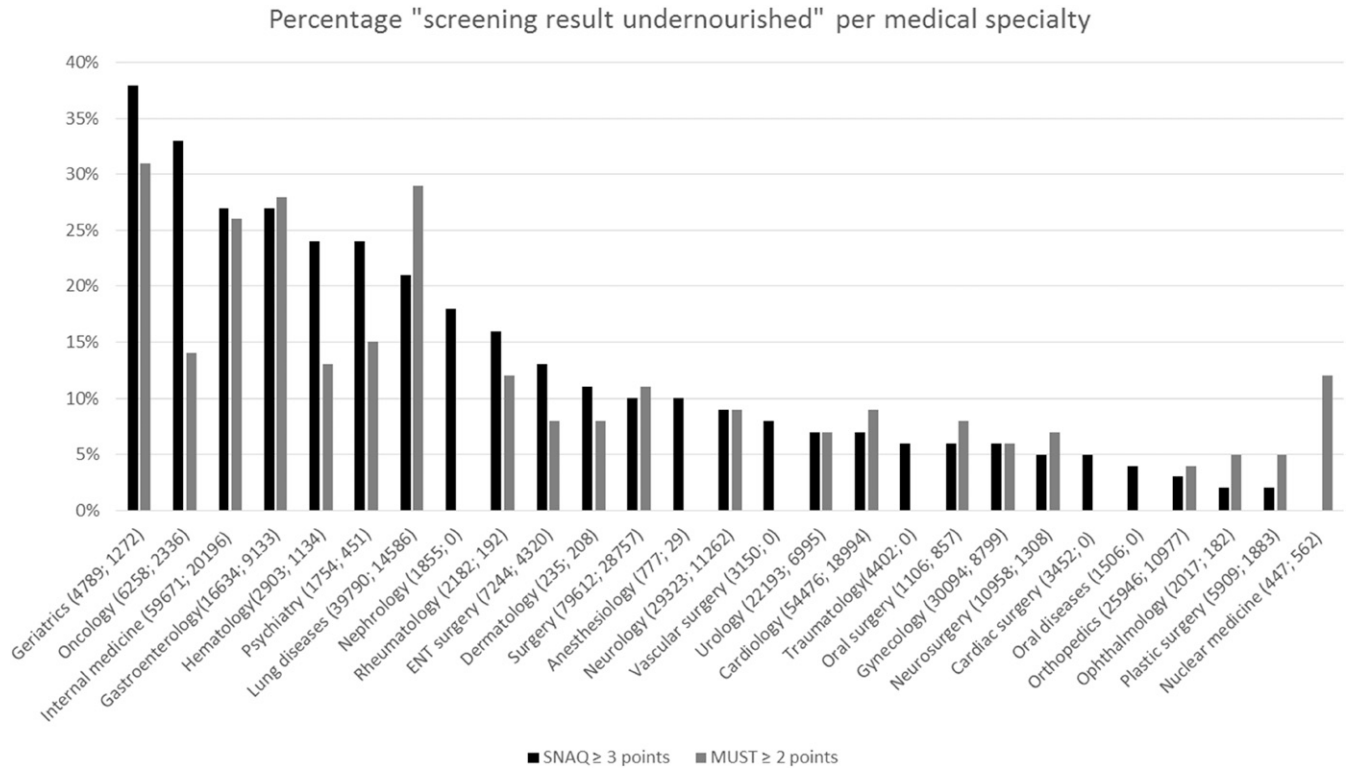

FIGURE 1 The percentage of "screening result undernourished" per medical specialty in 564,063 patients. ENT, ear, nose, and throat; MUST, Malnutrition Universal Screening Tool; SNAQ, Short Nutritional Assessment Questionnaire.

TABLE 4
Number of patients, age, sex distribution, and LOS divided for the SNAQ and MUST scores[1]

	Undernourished	Not undernourished	No screening
SNAQ			
n	46,005	290,038	83,043
Age, y			
Mean ± SD	67.6 ± 15.8	62.8 ± 17.4	55.3 ± 19.7
Mean (IQR)	70 (21)	65 (25)	58 (34)
>70, %	51	40	28
Sex, %			
Male	50	49	42
Female	50	51	58
LOS, d			
Mean ± SD	9.5 ± 10.7	6.2 ± 7.8	5.1 ± 10.4
Median (IQR)	6.8 (7.7)	4.0 (5.0)	2.9 (3.0)
MUST			
n	17,334	98,717	28,926
Age, y			
Mean ± SD	66.2 ± 16.8	62.5 ± 17.1	55.8 ± 19.9
Median (IQR)	69 (22)	66 (23)	58 (35)
>70, %	49	42	30
Sex, %			
Male	47	50	42
Female	53	50	58
LOS, d			
Mean ± SD	9.5 ± 11.0	6.3 ± 7.8	3.4 ± 5.3
Median (IQR)	6.6 (8.0)	4.0 (6.0)	2.0 (3.0)

[1]Undernourished defined as SNAQ ≥3/MUST ≥2; not undernourished defined as SNAQ 0–2/MUST 0–1. LOS, length of stay; MUST, Malnutrition Universal Screening Tool; SNAQ, Short Nutritional Assessment Questionnaire.

the MUST group, no difference in LOS was present in geriatric, neurosurgery, psychiatry, nuclear medicine, and ophthalmologic patients. These groups of patients had a much smaller sample size.

DISCUSSION

This study provides benchmark data on the undernutrition prevalence in 564,083 hospital patients in general and per medical specialty. To our knowledge, this is the largest study on the prevalence of undernutrition in hospitalized patients [in comparison, nutritionDay worldwide contains 169,000 patients and residents (10)]. A large number of patients were included, and the data were collected in a systematic way, resulting in information on the undernutrition rates in 80% of the patients admitted to 13 university, teaching, and general hospitals.

The percentage of screened patients increased over time. In the first 2 y, the screening percentage was low (<65%). In the SNAQ hospitals, data from 2009 onward could be used; in the MUST hospitals, data from 2012 onward could be used (>65% screened). This delay in reaching the minimal percentage of screened patients at admission shows that systematic screening can be successful but needs an implementation period of ≥2 y.

For the group of patients that were not screened, the missing values were lower and had a shorter LOS, leading to the assumption that these patients were less complex and that missing data of these patients would not have resulted in an underestimation but possibly an overestimation of the percentage of patients with a positive undernutrition screening result.

In 2001, the Dutch Dietetic Association conducted a national screening on undernutrition in which 6150 hospitals patients were included. Of these, 12% of the patients were undernourished, which was defined as >10% unintentional weight loss during the past 6 mo (11). Meijers et al. (3) defined undernutrition as a BMI <18.5, unintentional weight loss (6 kg in the previous 6 mo or 3 kg in the previous month), or a BMI between 18.5 and 20 in combination with no nutritional intake for 3 d or reduced intake for >10 d and found a prevalence of 23.8% in a group of 8028 hospital patients. In this study, 2 screening instruments were used. The percentage of patients with a screening result of undernourished was 13.7% in SNAQ patients and 14.9% in MUST patients. These percentages and the criteria to define the undernourished patients are closer to the 12% found by the Dutch Dietetic Association in 2001 than the 23.8% undernourished patients found by Meijers et al. (3, 11) This disparity can be explained by the fact that the SNAQ tool was developed and validated against the criteria (low BMI and/or unintentional weight loss) used in the Dutch Dietetic Association study (11). These criteria are also part of MUST.

The unique aspect of this study is the large number of patients and the subgroup analysis per medical specialty. The prevalence screening result undernourished varied from 2% in ophthalmology and plastic surgery to 38% in geriatrics. The geriatric, oncology, internal medicine, and gastroenterology wards had the highest prevalence of this same screening result. The patients in these specialties are generally complex patients. They often have a degree of inflammation, decreased appetite, and metabolic changes and are therefore at greater risk for undernutrition. This is not an unexpected result, but the actual percentage of patients with the screening score of undernourished was not reported in a large hospital population.

These results provide the basis for a discussion on the necessity of undernutrition screening in different wards. The quick, easy, and general character of screening with MUST and SNAQ is intended for all hospital wards, but it is questionable whether the medical specialties with undernutrition percentages of <5% should screen systematically.

A limitation of this study is that not all Dutch hospitals participated, mostly because screening is not added to the electronic patient chart system in all hospitals. The 13 participating hospitals chose to be in the study. To prevent bias, data for the years in which the percentage of screened patients was <65% were excluded.

Furthermore, the prevalence of a positive SNAQ and MUST score was not always similar. In the specialties geriatrics, oncology, hematology, psychiatry, and lung diseases, the prevalence of the screening score of undernourished was different in the SNAQ and MUST groups. Although these 2 screening instruments are both valid and have been proven to have a sufficient diagnostic accuracy, they categorize differently. Of the SNAQ oncology population (n = 6258), 33% had a positive screening score, in contrast to 14% of the MUST population (n = 2336). The difference between the SNAQ and MUST is that the SNAQ scores weight loss (>3 kg in 1 mo or >6 kg in 6 mo), appetite, and use of medical nutrition, whereas MUST scores BMI, weight loss (>10% in 3–6 mo), and acute disease effect on intake. Oncology hospital patients often have a decreased appetite and use medical nutrition, and because these risk factors for undernutrition are included in the SNAQ but not in the MUST, the SNAQ is more

TABLE 5
Longer LOS of patients with a screening score of undernourished compared with nonundernourished patients divided per medical specialty[1]

	SNAQ hospitals		MUST hospitals	
Specialty	Difference in LOS, d (95% CI)	*P* value[2]	Difference in LOS, d (95% CI)	*P* value[2]
Anesthesiology (777; 29)	1.60 (1.33, 1.93)	<0.001	—	
Cardiac surgery (3452; 0)	1.14 (1.04, 1.25)	0.005	—	
Cardiology (54,476; 18,994)	1.40 (1.36, 1.44)	0.001	1.29 (1.23, 1.35)	<0.001
Dermatology (235; 208)	1.36 (0.98, 1.89)	0.07	1.54 (0.84, 2.82)	0.16
Gastroenterology (16,634; 9133)	1.39 (1.35, 1.43)	0.001	1.47 (1.40, 1.54)	<0.001
Geriatrics (4789; 1272)	1.12 (1.07, 1.17)	0.001	1.08 (0.99, 1.19)	0.09
Gynecology (30,094; 8799)	1.36 (1.30, 1.43)	0.001	1.46 (1.33, 1.61)	<0.001
Surgery (79,612; 28,757)	1.53 (1.49, 1.56)	0.001	1.52 (1.47, 1.58)	<0.001
Hematology (2903; 1134)	0.94 (0.83, 1.07)	0.32	1.17 (0.96, 1.42)	0.1
Internal medicine (59,671; 20,196)	1.24 (1.22, 1.26)	0.001	1.30 (1.26, 1.34)	<0.001
Oral surgery (1106; 857)	1.97 (1.65, 2.34)	0.001	1.19 (1.03, 1.37)	0.02
ENT surgery (7244; 4320)	1.52 (1.41, 1.65)	0.001	1.71 (1.55, 1.90)	<0.001
Lung diseases (39,790; 14,586)	1.21 (1.19, 1.23)	0.001	1.28 (1.24, 1.32)	<0.001
Oral diseases (1506; 0)	1.66 (1.38, 2.00)	0.001	—	
Nephrology (1855; 0)	1.30 (1.13, 1.48)	<0.001	—	
Neurosurgery (10,958; 1308)	1.36 (1.28, 1.45)	<0.001	1.19 (0.98, 1.46)	0.08
Neurology (29,323; 11,262)	1.36 (1.31, 1.40)	<0.001	1.42 (1.33, 1.51)	<0.001
Nuclear medicine (447; 562)	—		1.43 (0.95, 2.15)	0.09
Oncology (6258; 2336)	1.25 (1.19, 1.31)	<0.001	1.57 (1.41, 1.75)	<0.001
Ophthalmology (2017; 182)	2.15 (1.59, 2.90)	<0.001	1.42 (0.82, 2.45)	0.2
Orthopedics (25,946; 10,977)	1.50 (1.43, 1.58)	<0.001	1.33 (1.24, 1.42)	<0.001
Plastic surgery (5909; 1883)	1.67 (1.46, 1.90)	<0.001	1.03 (0.85, 1.25)	0.8
Psychiatrics (1754; 451)	1.29 (1.03, 1.61)	0.03	0.90 (0.64, 1.27)	0.6
Rheumatology (2182; 192)	1.31 (1.19, 1.45)	0.001	0.73 (0.47, 1.13)	0.2
Traumatology (4402; 0)	1.52 (1.32, 1.75)	0.001	—	
Urology (22,193; 6995)	1.48 (1.42, 1.54)	0.001	1.47 (1.36, 1.59)	<0.001
Vascular surgery (3150; 0)	2.10 (1.81, 2.44)	0.001	—	

[1]Values listed in parentheses after each medical specialty indicate the sample size of both groups (SNAQ; MUST). ENT, ear, nose, and throat; LOS, length of stay; MUST, Malnutrition Universal Screening Tool; SNAQ, Short Nutritional Assessment Questionnaire.

[2]Linear regression analysis with (ln)LOS as an outcome measure and SNAQ ≥3/MUST ≥2, sex, and age as determinant variables.

sensitive for detecting undernutrition in this patient population. The higher scoring on the SNAQ may also have been partly caused by the fact that the SNAQ uses absolute amount of weight loss, whereas the MUST uses a percentage weight loss. Furthermore, the screening took place at admission, and particularly in this patient group, much attention is given to an optimal preoperative or prechemotherapy nutritional status. Hence, no nutritional intake for 5 d, a criterion of the MUST, would be a rare exception, so the MUST score is less likely to increase. Studies on the impact of the screening result of different screening tools on outcome variables such as LOS, survival, and complications in one large hospital population can give the information needed to help determine which screening tool is optimal in the hospital setting.

The LOS of positive undernourished screened patients was 1.4 d longer than for patients with a screening result of well nourished. Other studies also reported an association between undernutrition and hospital stay (12–14) but not in these large numbers and consistency per medical specialty. This difference in LOS shows the predictive value of the SNAQ and MUST and the clinical relevance of systematic undernutrition screening at admission. On the other hand, we know that undernourished patients are complex patients and that the increase in LOS in the undernourished group is therefore not explained solely by nutritional status. Undernutrition was not a determinant of LOS in dermatology, hematology, and psychiatry patients. In the geriatric, neurosurgery, nuclear medicine, and ophthalmology patients, MUST score was not a determinant of LOS. This result can be explained by the smaller sample size of these patient groups.

Optimal recognition and early treatment are important, but the treatment needs to be effective to make it beneficial for the patient. Bally et al. (15) recently published a systematic review and meta-analysis on nutritional support and outcomes in malnourished medical inpatients. They concluded that nutritional support increases caloric and protein intake and body weight. However, there is little effect on clinical outcomes overall except for nonelective readmissions. High-quality randomized controlled trials are needed to fill this gap. The data of this study can be used to raise awareness and detect the high-risk groups to set out high-quality research on the effectiveness of screening and treatment of undernutrition. In summary, in this national survey of over half a million patients, 1 out of 7 had a screening score of undernourished. For geriatrics, oncology, gastroenterology, and internal medicine, the ratio was even greater (1 out of 3–4 patients). Hospital stay was 1.4 d longer for undernourished patients than for well-nourished patients.

The authors' responsibilities were as follows—HK, SvK, and PW: analyzed the data; HK and SvK: wrote the manuscript; HK and AT: had primary responsibility for the final content; and all authors: designed the research and read and approved the final manuscript. None of the authors reported a conflict of interest related to the study.

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