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## Research Article

# Nutritional Risk in Pulmonology Outpatients and Health Professionals' Perspectives on Nutritional Practice

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## ABSTRACT

**Aim:** This study aimed to investigate the prevalence of nutritional risk by unintentional weight loss, "eating less", and nutrition impact symptoms in pulmonology outpatients and health professionals' perspectives on nutritional practice.

**Methods:** In this cross-sectional study, weight loss during the past three months, "eaten less" the past week and associated risk factors, were collected consecutively through a one-page questionnaire, for a full week in a pulmonology outpatient clinic at a Danish university hospital. Descriptive analysis, Chi2 and multiple logistic regression analysis were used for statistics. Health professionals' perspectives on nutritional practice were sought through semi-structured interviews including five nurses and two physicians.

**Results:** Of the 124 participants, 28% had an unintended weight loss of mean 5.5 kilos (SD 3.3) within the last three months and 26% had eaten less than usual over the past week. The most frequent specific nutrition impact symptom was loss of appetite, however insignificant. A good correlation between "Unintentional weight loss" within three months and "eaten less" within the past week, was found. Interviews with nurses and physicians revealed a low degree of implementation of nutritional practice, however, a positive attitude and wish for improved nutritional guidelines and strategies were found.

**Conclusion:** Based on the statistical analysis, there is a high prevalence of nutrition risk in the pulmonary outpatient clinic. Interviews revealed a wanting for priority and implementation of structures for good nutritional practice. Unintentional weight loss may be sufficient for the first identification of nutritional risk in the outpatient clinic. Therefore, guidelines for handling disease-related undernutrition in outpatient settings are required.

**Keywords:** Nutritional risk; Malnutrition; outpatients; Implementation; patients; COPD, Lung Cancer

## Introduction

Undernutrition in hospitalized patients is common, and its significant consequences for the individual as well as for society have been thoroughly described, including the associated risks of infections, complications, prolonged care and decreased quality of life, as well as mortality [1-3]. Undernutrition, also known as protein-energy malnutrition, is by ESPEN (European Society for Clinical Nutrition and Metabolism) defined as a consequence of inadequate

intake of proteins and energy, which, in combination with increased metabolism caused by acute or chronic disease, leads to a reduction of appetite and less food intake, forming a negative energy balance, leading to weight loss [4-6]. In a health economic perspective, undernutrition has been shown to account for 10% of total public health expenditure, of which much may be saved through improved nutritional efforts [7,8]. Timely optimizing of individual protein and energy intake in patients at nutritional risk has been reported with beneficial effect on weight loss, treatment execution, loss of muscle

and functional level, quality of life maintenance as well as reduce costs [9-13].

In hospitalized patients, an increased resting energy expenditure is expectable due to elevated metabolism following disease related cytokines. In addition, disease- and treatment associated symptoms are expected to bother eating abilities in patients at nutritional risk [14-16]. Based on acknowledgement of these factors, the process of good nutritional practice (GNP) has been implemented in hospital settings over the past decade or two [16-18]. Screening for nutritional risk within 24 hours of hospitalization, gives the opportunity to provide the right nutrition intervention to the right patients timely, and to prioritize the efforts of GNP to patients who will benefit from intervention [17,18]. A validated screening tool includes a combination of weight loss, reduced food intake and disease activity [18].

A successful handling of GNP in the clinical setting, has been shown dependent of structural and organizational factors [19]. Thus, a sound basis for handling nutritional risk in clinical practice is dependent on education of the staff, locally adapted evidence based guidelines, key-staff and distribution of responsibility, as well as the handling of quality ensuring audits. Based on the implementation of these factors, improvements for the handling of nutritional risk in hospitalized patients have been measured over the past years [18-20].

In Denmark, the proportion of hospitalized patients has declined over recent years, while the proportion of outpatients has increased during the same period. This is part of an overall national strategy to treat more patients in the primary sector outside hospital and in ambulatory hospital care. Many strategies have been made to educate and train staff for handling the reassignment of tasks. However, for the clinical nutrition area, no national recommendations have been accomplished for the outpatient care setting [21]. Chronic obstructive pulmonary disease (COPD) is a frequent diagnosis in the pulmonary medicine outpatient clinic, as well as lung cancer, and undernutrition is common in both diagnosis and closely associated with worse outcome [12,22-24]. Thus, we aimed to investigate the prevalence of unintentional weight loss within three months and reduced food intake within one week, among patients visiting the pulmonary medicine outpatient clinic at a Danish University Hospital. Furthermore, we wished to investigate the health professionals' perspectives on their own practice, attitudes and needs for handling undernutrition in the outpatient setting.

## Material and Methods

This study was designed as a case study including a questionnaire based cross sectional study, regarding the prevalence of "unintentional weight loss >2 kg within three months" and "eaten less than usual the past week", including all patients visiting the outpatient clinic for pulmonary medicine during one week. Furthermore, a qualitative interview study was performed including five nurses and two physicians working in the same setting.

**Setting:** The outpatient clinic for pulmonary medicine examines and treats patients with lung diseases, chronic obstructive pulmonary disease (COPD), persistent pneumonia, shortness of breath of unknown cause, asthma and other allergic disorders. Furthermore, patients with lung cancer are followed during the diagnostic assessment program and after treatment.

## Questionnaire based investigation of nutritional risk in patients visiting the outpatient clinic

**The questionnaire included nine questions regarding the following factors:** Gender, age, reason for visiting the clinic (treatment, investigation, ambulatory follow-up, results of physical examination, course of investigation). Nutritional risk was sought by asking the patients if they had noted unintentional weight loss (>2 kg) within three months, if yes, how many kilos the patients had lost, and if the patient had eaten less or as normal within the past week [25,26]. Furthermore, the questionnaire included the five most common nutritional impact symptoms; nausea, pain, lack of appetite, dysphagia and worries regarding disease [9,23,27]. Furthermore, patients were asked if they had eaten less for the social reasons; eating alone and lack of help with food and eating [23,28]. Lastly, patients were asked if they had talked to any professionals (and if, which profession) about weight loss, and if they had intentional weight loss within the three months.

**Inclusion:** Posters highlighting the study-event were set up at the reception and inside the outpatient clinic. After registering at the reception, patients were contacted by the investigator, giving information and inviting them to participate in the study. A weighing scale and a height measuring scale were placed outside the consultation rooms. If willing to participate, patients could fill in the questionnaire themselves, or have the questions read and filled in by the investigator. Patients were advised weighing, if they did not weigh themselves on the particular morning, and older patients to have their height measured if this was not done recently. Data were entered in EPIDATA 4.2 and double checked. Missing data were entered as 999 and excluded from analysis.

**Statistics:** A descriptive analysis was made and presented as number (N) and mean  $\pm$  SD. Multiple logistic regression analysis were used to test for the association between demographic features and "unintended weight loss". Chi2 formed the multiple regression analysis and Fishers exact test when N was five or lower.  $P < 0.05$  was considered significant and Odds Ratio (OR) was given with a 95% confidence interval (CI). Associations were adjusted for gender, BMI and age. Data were analyzed using SAS for Windows version 9.4.

**Ethical considerations:** Participation was on voluntary basis and no data enhanced could lead back to the particular patient. The regional ethic committee found no reason for full application. Application ID: 2018-146.

## Qualitative interview study

The interviews were performed as a conversation using a semi structured interview guide [29]. The development nurse affiliated to the outpatient clinic selected informants between nurses and physicians with the inclusion criteria: Working in the clinic for six months or more, general knowledge regarding clinical nutrition, willingness to participate and be outspoken about routines, barriers and strengths with regard to nutritional care in the clinic. Seven interviews were generated, including five nurses and two physicians. The interviews were recorded and transcribed verbatim right after the interview session. Data were analyzed using a qualitative content and constant comparative method, moving between closeness and distance, in order to deepen the understandings of meaning. During the structured analysis, patterns of meaning were found and six

categories emerged. The quotations presented in the result section represent these themes by typifying the meanings. Quotations were translated into English by author and confirmed by co-authors.

## Results

### Questionnaire

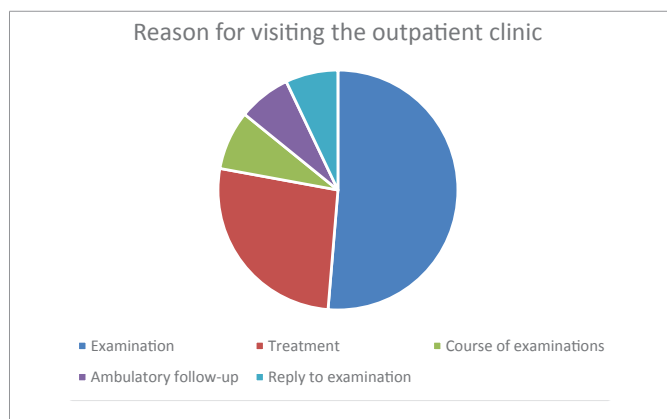
The study included 124 patients. Of these, almost half were male and mean age was 58 years. Mean BMI was 27.7kg/m<sup>2</sup>. Table 1 shows demographic features. The most prevalent reasons for visiting the clinic were "Examination" and "Treatment". Figure 1 shows reason for visit. Nine patients were not included, due to not wanting to participate or the health professionals signaling to the investigator not to approach the patient.

Of the included patients, 28.2 % had an unintentional weight loss within the past three months. These had a mean weight loss of 5.5 Kg. Furthermore 9.7% had lost weight intentionally. Eating less than usual within the past week, was experienced by 26.6% of the patients. Table 2 shows weight loss and "eaten less" for the population.

Specific nutrition impact symptoms were experienced by 41 patients. Of these, the most common reason was lack of appetite (n=25), while six suffered from nausea, five from worries, four from pain and one from social reasons. Furthermore 24 of the patients claimed "other reasons" (unspecific symptoms) to cause unintentional weight loss and eating less than usual. However, no significant differences were found for neither weight loss or eating less, with logistic regression looking at age, sex, BMI or reason for visit. "Unintentional weight loss" within three months and "eaten less" within the past week, seems sufficient for the identification of nutritional risk in the outpatient clinic. Furthermore, OR for unintentional weight loss, when also eaten less, was 7,684 (CI5,147 ; 11,472), indicating that asking patients for unintentional weight loss may provide sufficient indication whether the patient is at nutritional risk and may need intervention.

Table 1: Demographic information for the included patients.

Variables N=124	
Sex (Male) N (%)	58 (47.7)
BMI. kg/m <sup>2</sup> Mean (SD)	27.7 (8.6)
Age. Years. Mean(SD)	58.8 (16.7)



**Figure 1:** Reasons for the 124 included patients to visit the outpatient clinic for pulmonary diseases.

Table 2: The prevalence of unintentional weight loss, eating less and NIS.

Variables	
Unintentional weight loss within three months. Yes %	28.2
Unintentional weight loss. Kg, Mean (SD)	5.5 (3.3)
Eaten less than usual the past week. Yes, N (%)	33 (26.6)
Intentional weight loss. Yes, N (%)	12 (9.7)
Nutritional impact symptoms. Yes, N (%):	
Nausea	6 (5)
Pain	4 (3)
Worries	5 (4)
Swallowing problems	0 (0)
No appetite	25 (20)
Social reasons for eating less:	
Eating alone	1 (0.8)
Lack of help with preparing food or eating	0
Other reasons for eating less	24 (19)

Only 9% (N=11) of the participants had spoken with professionals about weight loss or eating problems. Of these, five had talked to their general practitioner, three to a dietician, two to the outpatient clinic physician and one to a nurse in the outpatient clinic.

Logistic regression analysis showed that among those with BMI <20.5, the prevalence of weight loss was 57% and 50% experienced eating less than usual within the past week Table 3 shows the association between "unintentional weight loss" sex, age and BMI.

### Qualitative interview study

Seven staff members, five nurses and two physicians were interviewed. The working experience in the clinic and among the interviewed informants varied from six months to thirteen years.

The interviews generated six significant themes, which are presented under subheadings.

#### Nutritional status is important

A general common perception was found throughout the interviews, that nutritional state is important for and affects the patients in connection with the diseases seen in the outpatient clinic. The informants expressed in professional words, respect for nutritional intervention to have positive effects on the patients' course of treatment, depending on the diagnosis. However, none of the informants gave insight towards consequences if no nutritional efforts are made for the patients. As one nurse expressed:

*"Nutrition has a tremendous importance in their[Patients] further course of treatment. All these cancer –and COPD patients who come here. It's an important part of their treatment"(Nurse).*

The informants have noticed a greater attention to nutritional aspects in the past years.

*"I have changed my focus on nutrition in the past three to five years. I have become much more aware of what nutrition means because of the common attention in society, and because it is thrown to your face with a large sign on the food trolley in the hospital wards"(Nurse).*

#### A topical but overlooked problem in the clinic

All informants indicated that they often or even daily, see patients with unintentional weight loss and signs of malnutrition.

Table 3: The association between "unintentional weight loss" sex, age and BMI.

Variable / Unintentional weight loss. N, yes (%)	p-value	Odds ratio	Confidence interval
Sex Male: 20 (34.5) Female (ref): 15 (24.5):	0.164	1.767	(0.789 ; 3.955)
Age:	0.7015		
0-19 0 (0)		0.6	(0.148 ; 2.427)
20-39 3 (23.08)		0.6	(0.240 ; 1.503)
40-59 9 (23.08)		1	(0.260 ; 5.535)
60-79 (ref) 20 (33.33)		1.2	
80-99 3 (37.50)			
BMI**:	0.241		
Underweight 4 (57.14)		3.238	(0.640 ; 16.382)
Normal weight 8 (21.05)		0.648	(0.239 ; 1.757)
Overweight 14 (29.17)		1	(0.383 ; 4.747)
Obesity class 1: 25 (35.71)		1.349	(0.035 ; 2.659)
Obesity class 2: 1(11.11)		0.304	(0.311 ; 18.986)
Obesity class 3: 2 (50)		2.429	

\*BMI is classified according to the WHO classification of BMI groups

*"I see one who is 20 kilos too little and is undernourished -the bones protrude and all. I think we forget about those who may have lost from maybe 100 kilos to 80 - we should also do something about those"(Nurse).*

Informants speak about nutrition with the patients, if they or the patient find it important enough for the consultation.

*"I talk to patients as far as I can about nutrition."* (Physician).

He seems to use it in a broad sense, while one of the nurses feel her practice of talking nutrition with the patients is limited, due to prioritization of other tasks.

*"Maybe it's not nutrition we find most important, even though it's really important. So it is mostly in patients where we can see "okay this is completely out of proportions", or they have not eaten or their nutritional status is quite bad, where we bring it up a bit more. Otherwise, you can let them speak to their general practitioner themselves"(Nurse).*

Thus, they try to identify patients at nutritional risk, but conversely, seen as distancing themselves from the task as it is expected to be performed by another body, which in this case is the general practitioner.

Several of the informants say that the management of the patients' nutritional status in the outpatient clinics is currently inadequate. For example, one brings following statement:

*"I experience the handling of the patients' nutritional status as sparse - almost absent. I do nothing practical, other than getting an emphasis on them [the patients], if I remember it, like weighing them, so that you have a starting point. But otherwise nothing"(Physician).*

The quote indicates that it is only if the health professional (HP) remembers that they measure or ask the patients' about their weight. It is not a defined or structured part of the consultation, but something the HP has to keep in mind. In the same sentence, it is argued that weighing the patient is to have a starting point, which may indicate that the weight is thus decisive for what must happen subsequently, but then no further action is taken.

This experience of the lack of handling of the patients' nutritional status is also found in another of the nurses. This is expressed in the following quote:

*"I believe that the management of the patients' nutritional status in the outpatient clinic is non-existent"* (Nurse).

Though the following quote brings the understanding that nutrition is cared for in the nutritionally threatened when it is physically visible or if patients by own initiative express lack of appetite.

*"Not in all patients - far from, but in those [patients] who are really undernourished who start talking about the lack of appetite or you [the health professional] sense it"* (Nurse).

### Patients seldom bring it up

It is the common believe among informants, that patients expect physicians and nurses to handle disease, not nutrition. The informants do not find that the patients themselves take the initiative to talk about nutritional problems, which they describe as if the patients do not necessarily associate nutritional state with disease and how they experience symptoms. One informant describes how he experiences that very few patients bring up nutrition and asks about it:

*"I would say" fifty / fifty " , well probably close to 20% ask how they can put on weight or lose some"*(Physician).

At the same time, there is a shared view among the informants that nutrition is not a focus area for the patients when they attend a consultation. It may reflect patients' lack of knowledge regarding nutrition and expectations that nutrition is an area in which the outpatient clinic should advise. Another physician explains in the following two quotes:

*"I have not yet experienced that patients themselves speak of nutrition at a consultation. Relatives sometimes do ... I think many of our patients focus on other things than nutrition when they come to us"*(Physician).

*"I don't think the patients bring up nutrition because the patients, especially the elderly patients, prefer not to be in the way or be troublesome. - So they usually do not ask questions beyond what is on their list of symptoms"*(Physician).

He senses the patients may withhold- perhaps not to waste the doctor's time, and questions whether the reluctance of the patients may be that they do not perceive nutritional problems as associated to the health state or that professionals do not find it important to talk about.

### Barriers for nutrition intervention

It seems that experience and foremost personal interest defines whether and how nutrition is handled.

A few of the informants ask patients what they eat and try to guide them on what to eat based on their feedback, in regard to their current condition.

*"I talk to them about what they eat and about what they like,- to try to nudge where there is something to do. Then I talk to them [the patients] about supplementing with, especially protein, between meals"* (Nurse).

However, in the quotation below, the physician states that his knowledge of nutrition is sparse and that he has not sought renewed knowledge for the task:

*"My knowledge in nutrition is sparse, it's something I can remember from the medical study. As- you need some building blocks –and -you just eat a little extra fat and cream. I haven't read any major works or anything"* (Physician).

Furthermore, one of the nurses expresses a lack of understanding and insight into the tools which may be used, revealing uncertainty of the task's background and output. She experience that the lack of understanding for her is a barrier in the management of nutritional efforts.

*"I think it is the lack of understanding and insight into the tools I use in the consultation on nutrition - what happens to the patient and what possible consequences can occur, it is a barrier... I have also been part of a nutrition group here in the hospital. But it was mostly about supplements. I don't have much background or knowledge about the ways we treat, but have learned a little along the way"* (Nurse).

The informants state that they have each acquired their knowledge of nutrition in different ways, where some feel more adequately equipped than others. Handling nutrition is not a competence that they jointly on agree.

Another limitation for the HP's is that there is no dietician associated with the outpatient clinic. This entails that they must refer to one in the municipality, which they rarely do. Furthermore, the informants are in doubt as to whether there are guidelines, nutrition key persons, and written material to share with patients. Thus, they have limited structural means for dealing with nutrition issues. Some informants are familiar with a recent guideline for the COPD clinic, and come up with several specific tasks described therein, suggesting that they have learned it as a "normal" and incorporated task while others are unaware.

*"I don't think we have any guidelines for nutritional guidance or nutritional screening, but I don't know ... I think we might have a folder or the like, I don't really know"* (Physician).

Thereby, based on the staff's experience of lack of knowledge and different approaches to nutrition, it can be deduced that there is a need for education, implementation of common guidelines and someone to call for sparing, as well as the possibility to refer to a dietician . Based on the statements, guidelines should include what needs to be done or advised, for which nutritional problems and diagnosis.

### Division of responsibilities

There seems to be no clear division of nutritional tasks between the different professions. A physician describes how he experiences the division of labor:

*"The only place that is defined, what is the physicians' task and what is the nurse's in relation to nutritional problems, is in our COPD outpatient clinic, where the nurses take care of nutrition if it is overweight and we take care of malnutrition. On prescription of medical nutritional supplements - there must be a medical signature"* (Physician).

On the other hand, one of the nurses sees it differently.

*"Well, it really depends on the outpatient clinic, or where they [the*

*patients] are seen. But in the COPD outpatient clinic, it is the nurse's task to talk about nutrition. I think it is a nurse's task and then it is a common task in the other places [i.e. other diagnosis]"* (Nurse).

Thus, a diversity is seen in the perception of the division of tasks. Furthermore, some informants express security about their own areas of responsibility, while others are more uncertain and justify this by lack of education.

### Lack of time and priority from the management

The HP's experience lack of time to be able to handle and ability to prioritize time for nutritional aspects, and mention this many times throughout the interviews. There is a broad consensus that the staff has too short time with the patients in the outpatient clinics, and that this lack of time is a hindrance to also being able to handle the patients' nutritional status in addition to the other tasks. This is expressed in the following quotation:

*"Nutrition is one of the things that comes a little secondary when we have the time we have. So we must prioritize"* (Physician).

The informants also believe that nutrition is a topic that management does not visibly support or describe as a task.

### Discussion

In the present study we aimed to investigate the prevalence of unintentional weight loss within three months and reduced food intake over the past week, among all patients visiting the pulmonary medicine outpatient clinic within one week. Furthermore, we wished to investigate the perspectives of health professionals' in the same setting, on their own practice, attitudes and needs for handling undernutrition.

Very few patients declined to participate. We used "unintentional weight loss" and "eaten less the past week" as a measure for undernutrition, as these variables are quick and feasible to measure, included in almost all validated screening tools and have also been used in other studies investigating the same problem in other settings [11,30,31]. We found a prevalence of 28% unintentional weight loss, with a mean loss of 5.5 kilos and a prevalence of 26% of patients who had eaten less than usual in the past week. Based on these findings, we gather "unintentional weight loss" and "eaten less the past week" as relevant and sufficient for screening in the outpatient setting, as also found in other populations and recommended in guidelines for screening tools [2,5,6,11,12,16,26]. Although a tendency for risk factors for unintentional weight loss was found, including age, reason for visiting the outpatient clinic and nutrition impact symptoms, none were found statistically significant. A larger sample would most likely have been able to show significant indicators of nutritional risk, as found in the larger study within five different outpatient clinics at the same university hospital setting [32].

The majority of the patients were slightly overweight. However, we find that an unintentional weight loss of mean 5.5 kilos is quite significant and will according to former studies, have a negative impact on quality of life, physical function as well as clinical outcomes [1,2,14,24,30,33,34]. A weight loss of 5.5 kilos would most likely obtain attention from patients and relatives [35]. Despite this fact, it was the experience from the health professionals that patients seldom seek their advice on unintentional weight loss or eating less. This is in accordance with the patients' information in the questionnaire

study, which showed that only a few of the patients had talked to a professional about the unintended weight loss. Furthermore, findings in the study showed that some patients had an intended however unsupervised weight loss, despite the fact that COPD increases energy expenditure. Even though energy expenditure varies between gender, age and metabolic activity, a health professional supervision regarding wished weight loss seems particularly relevant in patients who, due to disease, may be sedentary [36]. Thus, health personnel could deliver useful and meaningful information to the patients and empower them to make healthy decisions in order to maintain muscle mass. The interview based study showed that staff in the outpatient clinic did not screen patients for undernutrition, but noticed undernutrition in patients who were very skinny or showed obvious signs of weight loss. In a former study evaluating survival in cancer patients according to weight loss and BMI, weight loss was found to predict negative survival, however a higher BMI was found protecting. The study found that the severity of WL should be evaluated based on the rate of WL and the level of depletion of body reserves [33]. However, as also emphasized, the study cautions that this does not mean that weight loss has no clinical consequence in the obese, as significant threats to survival has been found in obese and overweight patients with cancer [37,38]. Furthermore, in COPD weight loss and reduced food intake has shown to influence physical function negatively, regardless of BMI [12,39,40]. Based on this study, which for one week included patients visiting the pulmonary outpatient clinic consecutively, actions towards nutritional risk should be taken systematically.

In the study, we however found that the handling of nutritional risk to a very low degree took place, and was determined by very significant visible signs of weight loss, or patients or relatives asking. This despite the fact that the staff acknowledged nutritional deficiency as important and often seen in the clinic. A successful handling of nutritional risk in this manner may be difficult, since actually, the vast majority of these patients were overweight at baseline, and thus a large amount of weight loss is required to alert objective signs, in staff who may not have seen the patient earlier. The lack of actions were in correspondence with the health professionals experience of lack of knowledge, nutritional education, means of referral to dietician and key-persons, implementation of guidelines and lack of time and priority from management. Former studies have shown that indicators for nutritional intervention is dependent of structural and organizational strategies [7,19,20,41]. This lack of taking action and responsibility for nutritional care, regardless of understanding has been shown in another qualitative study regarding nurses, who had difficulties taking responsibility for nutritional care. In that study, nurses improved care after education, however they found that the improved practice decreased after a short while, because of lack of priority and time given for the tasks [41]. Based on these indications, education of staff is not enough to ensure good quality of nutritional care. The present study gives another indication that the whole package of structure and organization must be considered for implementation, if maintenance of good quality practice is requested. The present study may represent a quality ensuring audit for the offset of implementation of a structured strategy for handling undernutrition, which is also recommended in former studies.

The results of this study indicate a need for national guidelines and recommendations, which have yet to be developed for outpatient clinics to support nutritional practice, even though all indications are to increase outpatient care for in-hospital stay.

## Conclusion

A high prevalence of 28% of unintentional weight loss was found in the pulmonary outpatient clinic. Although there was a very positive attitude towards working with undernutrition and the clinical impact of undernutrition was highly acknowledged between nurses and physicians, nutritional practice was found sparse and unstructured by the health professionals themselves. Priority from leaders and a well-organized structure for working with good nutritional practice was wanted by the staff and may be considered for out-patient clinics at local and national level.

## Conflicts of Interest

The authors have no conflicts of interest to declare for this study.

## Acknowledgments

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