Nutritional situation in German hospitals – Results of the nutritionDay project 2018[1, 2]

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Abstract

The aim of one project for the 14th German Nutrition Society Nutrition Report *(DGE-Ernährungsbericht)* was to describe the nutritional situation in German hospitals and nursing homes using existing data from the global nutritionDay project, and to compare it with the situation in other European countries. In addition, the project aimed to collect current data on the nutritional situation in German institutions as part of a nationwide initiative at nutritionDay 2018. The main hospital results of this initiative will be presented in this article.

25 hospitals with 48 wards and 767 patients participated and were subsequently included in the analysis. The results document that malnutrition is a relevant health problem among German hospital patients, that required nutritional routines and infrastructures are not always in place, and that there is a clear deficit in terms of nutrition-related medical expertise.

Actions are urgently needed to improve nutritional care in hospitals, to prevent the development of malnutrition and to adequately treat existing nutritional problems.

Keywords: nutritionDay, malnutrition, nutritional situation, hospital, nutrition team, nutrition report, food intake

Introduction

Food intake may be difficult or even impossible for people who are ill or in need of care for a variety of reasons including e.g. loss of appetite, swallowing difficulties, or cognitive impairments. In addition, diseases are often accompanied by impaired nutrient utilisation and/or increased energy and nutrient requirements. Therefore, hospital patients are at an increased risk of malnutrition [1], which is associated with serious consequences not only regarding the health of those affected, but also in terms of increased costs for the healthcare system [2]. Numerous studies have documented a high prevalence of malnutrition in hospitals [3–6]. In Germany, the nutritional situation of hospital patients was investigated in the German Hospital Malnutrition Study around 15 years ago [7]. Signs of malnutrition were found in 27% of the participating 1886 patients from 13 hospitals who were examined on the day of admission. Another multicenter study conducted in 15 German hospitals reported a markedly reduced body mass index (BMI) in 8.5% of the included study patients [8]. Besides, there is hardly any data available on this topic.

The nutritionDay project

nutritionDay is a global project with the core aim to increase awareness of nutritional problems in hospitals and care homes. Starting in Austria in 2006 in conjunction with the Council of Europe resolution to improve nutritional care in hospitals [9], meanwhile institutions from 64 countries are taking part. Each year on a pre-defined date, data is collected on the nutritional situation of hospital patients and care home residents with the

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support of staff and patients. Using standardized questionnaires, which are available on the Internet in 30 languages (www.nutritionday.org), information on nutritional risk factors, nutritional status and nutritional interventions is obtained at the level of the patient or resident and at institutional level. A short follow-up data collection is performed 30 days later in the case of hospitals and 6 months later in the case of care homes. Immediately after the data is entered into a central database via the Internet, the participating hospital wards and care home sections receive an evaluation of their results compared to all other participants, both in their own country and worldwide, which can then be used for benchmarking purposes. The database is also available for scientific use, and numerous publications were developed in recent years (including [10–12]).
From the beginning of the project, institutions from Germany have also been taking part in the survey and feeding their data into the nutritionDay database online in anonymous form, although the number of participants has declined sharply in recent years.

Objectives

The aim of the project for the 14th German Nutrition Society Nutrition Report was to describe the nutritional situation in German hospitals and nursing homes using existing data from the global nutritionDay project and to compare it with the situation in other European countries. In addition, the project aimed to collect current data through targeted promotion of the project as part of a Germany-wide initiative for nutritionDay 2018. The results are to be used as the basis for recommendations for action aimed at improving nutritional care in hospitals and nursing homes in Germany.
This article summarizes a selection of results regarding the nutritional situation in German hospitals that were obtained as part of the Germany-wide nutritionDay 2018 initiative. The full version of the chapter "Nutritional situation in German hospitals and nursing homes – results of the nutritionDay project" for the 14th German Nutrition Society Nutrition Report is available at www.dge.de/14-dge-eb/vvoe/kap2.

Methodology

This project was carried out in close co-operation between the participating partners: nutritionDay Vienna, the German Society for Nutritional Medicine (Deutsche Gesellschaft für Ernährungsmedizin—DGEM), the German Nutrition Society (Deutsche Gesellschaft für Ernährung—DGE) and the Institute for Biomedicine of Aging (Institut für Biomedizin des Alterns—IBA) of the Friedrich-Alexander University of Erlangen-Nuremberg (Friedrich-Alexander-Universität Erlangen-Nürnberg—FAU).

Recruitment of institutions

In addition to the usual advertising efforts of the nutritionDay office in Vienna, nutritionDay 2018, which took place worldwide on November 15, 2018, was advertised in Germany using a variety of measures. As early as spring 2018, research was underway to find the contact details of hospitals in Germany on the Internet. Twenty-five university hospitals, 50 hospital nutrition teams and 100 other hospitals were contacted: first by e-mail and then by telephone. In case of interest, informational material was then sent and support from FAU staff offered regarding data entry.
In addition, the project partners' existing personal contacts were utilized: the project partners got in touch with these contacts by telephone and e-mail and encouraged them to participate. Furthermore, advertisements, short reports and more detailed articles in professional journals were used to increase awareness of the project. Over the course of the year, participation in nutritionDay was promoted at various congresses, at training courses for doctors and by Fresenius and Nutricia sales representatives. Moreover, the nutritionDay website was translated into German in order to facilitate access to the project and to the questionnaires. The website was also expanded upon with additional information about the initiative in Germany specifically.
Finally, 44 dietitian and nursing schools were contacted by e-mail and alerted to the opportunity to participate in the project, and students on the masters course in Gerontology at the FAU were offered to support the project in the context of a project work.

Data collection procedure and content

The data collection was carried out on nutritionDay, November 15, 2018 by the on-site staff, who were in part supported by pupils or students, as well as by the patients of the participating hospitals. A hospital questionnaire and a ward questionnaire were completed by doctors and nurses to collect general structural information about the facility and about the organization and structure of nutritional care. Another questionnaire, which was also completed by the staff for all patients present, provided information about the patients (e.g. weight, height, diagnoses, nutritional status, nutritional therapies). In addition, all patients answered questions about themselves (e.g.

Overview 1: Criteria for the recording of malnutrition in the nutritionDay project

- Underweight according to the WHO definition [13]: BMI < 18.5 kg/m²
- Underweight according to the ESPEN definition [14]:
  - severe underweight:
    BBMI < 18.5 kg/m² in persons < 70 years old
    or < 20 kg/m² in persons ≥ 70 years old
  - moderate underweight:
    BMI 18.5 to < 20 kg/m² in persons < 70 years old
    or 20 to < 22 kg/m² in persons ≥ 70 years old
- unintentional weight loss > 5% in the past 3 months
- subjective clinical assessment by the staff (Was this patient identified as malnourished or at risk of malnutrition? Malnourished, at risk or no)

mobility, independence, subjective health, weight loss) and about their diet. Malnutrition was recorded based on multiple criteria (◆ Overview 1).

Data input and analysis

The participating institutions entered the data in anonymized form via the nutritionDay website using an input mask that matched the questionnaires. The extensive clinical data set was analyzed at the Center for Medical Statistics, Informatics and Intelligent Systems of the Medical University of Vienna using the statistics program R. The inclusion criterion for the evaluation of patient data was a patient age of at least 18 years.

Year of data collection	Hospitals	Wards	Patients
2006	36	103	1,695
2007	40	109	1,857
2008	30	70	1,211
2009	33	80	1,453
2010	24	60	1,115
2011	16	56	1,004
2012	16	36	558
2013	9	23	312
2014	8	26	377
2015	15	39	626
2016	11	24	408
2017	9	20	212
2018	**25**	**48**	**767**
total	272	694	11,595

Tab. 1: **Number of hospitals, wards and patients that took part in nutritionDay in Germany each year (only wards with > 75% follow-up data and patients ≥ 18 years old)**

Results

Participant numbers

In 2018, 25 hospitals with 48 wards and 767 patients were included in the evaluation (◆ Table 1).

Six of these hospitals had already participated in at least one of the previous years, and one of these was involved in all previous years except one. Nineteen new hospitals were recruited. The participating patients in 2018 were predominantly from surgical wards (27%) and gastroenterological wards (24%).

Structural aspects of the participating wards

On nutritionDay 2018, an average of 16 patients per ward took part (interquartile range [IQR]: 11–20 patients). This corresponds to an average of 62% (IQR: 40–69%) of the patients present.

Only 10% of the participating wards reported that at least one dietitian was working on the ward on nutritionDay. In just over half of the wards, there was either a dedicated person responsible for clinical nutrition (56%) or a nutrition team (58%).

Routine screening for malnutrition was carried out at 88% of the wards. Just over half (54%) reported that they routinely weigh patients at admission. Three quarters of the wards (75%) used guidelines or standards for clinical nutrition.

Patient characteristics

The median patient age was 68 (IQR: 55–78) years, and about half were female. 58% were 65 years old or over. 88% of the patients came from home and only a few (4%) were transferred from another hospital. For almost half of the patients, admission to hospital was planned (42%), and almost half were emergency cases (46%).

Although only 17% of the patients were reported to have more than two different diagnoses, five or more different oral medications were planned for 58% of the patients on nutritionDay. A stay in the ICU was reported for

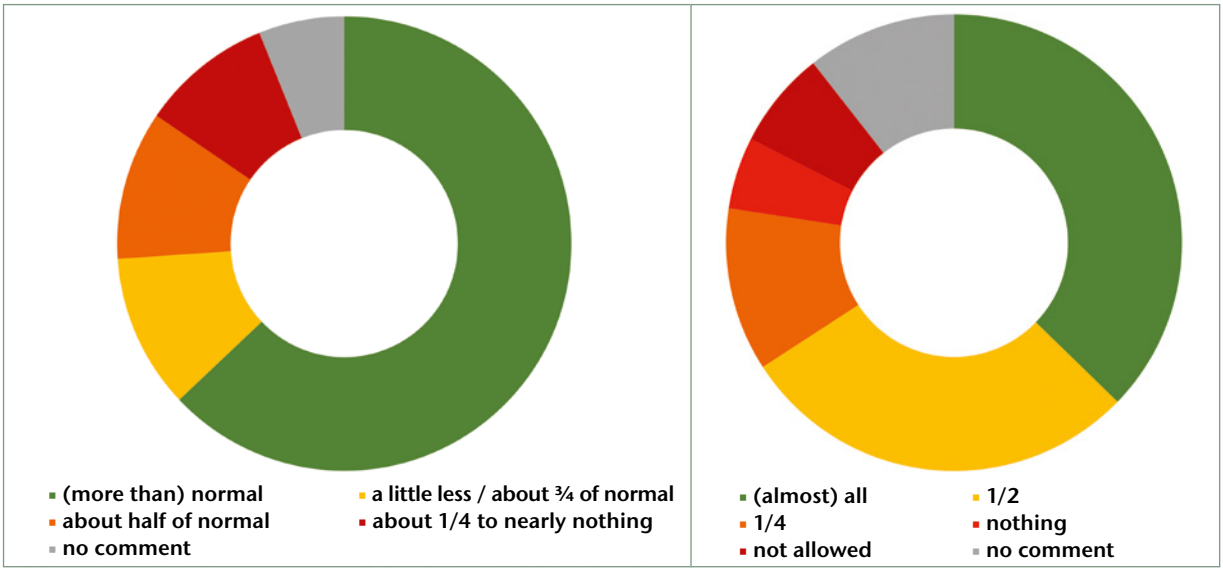

Fig. 1: **Food intake in the week before hospital admission (left) and at lunch on nutritionDay 2018 (right)** (n = 767)

14% of patients and 13% were reported to have a terminal illness. Overall, most of the patients were independently mobile (64%). 8% were bedridden. When asked about their own health, 31% of patients evaluated it as good or very good, and 24% as poor or very poor. By far the most common diagnoses were conditions of the gastrointestinal tract (42%), followed by cardiovascular conditions (25%) and endocrine diseases (22%).

Nutritional status of the patients

The average BMI was 26 ± 6 kg/m². According to the WHO definition, 5% of the patients were underweight, although there was a relatively high proportion of missing values (9%). According to the ESPEN definition, 8% were severely underweight and 9% were moderately underweight.

Unintended weight loss of more than 5% in the last 3 months was reported in 28% of patients, and the loss was more than 10% in 17% of patients. Some extent of weight loss was reported for 42% of patients.

The question that was put to the staff as to whether the patient was identified as malnourished was answered with yes for 12% of the patients. A further 12% were documented as at risk, and for 11% no information was available regarding this.

Patients´ food intake

Almost two thirds of patients (63%) reported that their food intake was the same as usual or even more in the week before they were admitted to hospital. 21% said they had eaten only about half as much as usual, or even less (◆ Figure 1, left).

At lunch on nutritionDay 2018, 37% of the participants ate all of their meal, 5% reported that they ate nothing although they were allowed to eat, and 7% reported that they were not allowed to eat (◆ Figure 1, right).

Around half of the patients (48%) gave reasons why they did not finish all of their lunch. By far the most common reason was a lack of appetite (21%), followed by "I wasn't hungry" (10%) and "I didn't like the type of food offered" (9%) (◆ Figure 2).

The question about overall satisfaction with the hospital food showed that 47% of the patients were either very satisfied or extremely satisfied with the food. 9% were unsatisfied, 4% were very unsatisfied, and 24% evaluated the food as neutral. 17% did not comment on this.

Diets and nutritional interventions

The majority of patients (79%) received normal hospital food. Special diets were prescribed for 14% of the patients. A significant proportion of the patients (21%) reported eating other food in addition to the hospital food. Fortified food was given to 7% of the patients and 14% received oral nutritional supplements. Enteral nutrition was in place in 3% of patients and parenteral nutrition was in place in 4%.

Discussion

Methodological aspects

Thanks to the campaign in Germany with targeted **recruitment** and support for the surveys on nutritionDay 2018, there was a significant increase in participation, countering the continuously declining participation in Germany in recent years (◆ Table 1).

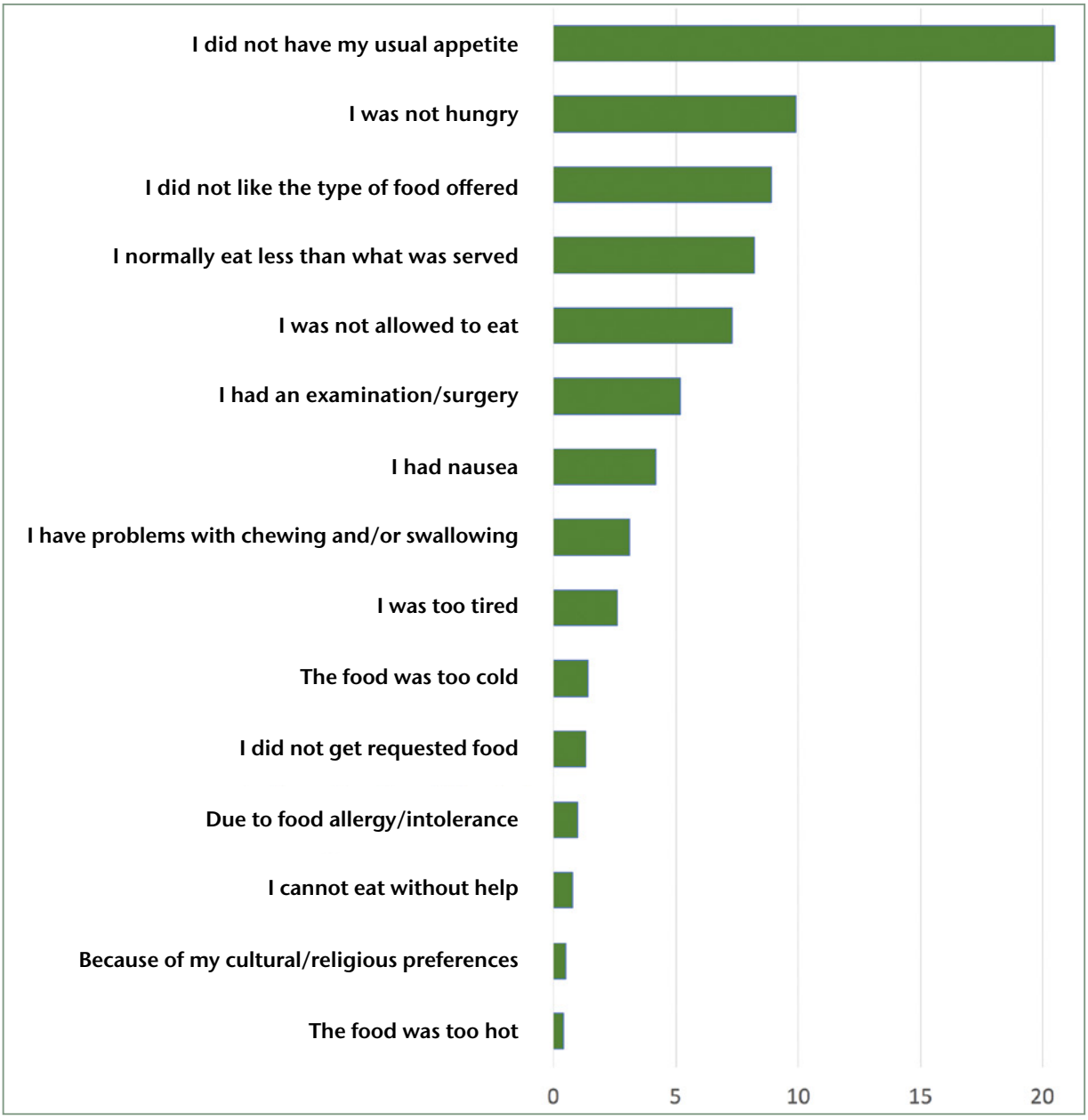

Fig. 2: **Reasons for not eating everything at lunch on nutritionDay 2018 (n = 767) [%]**
(Several responses may be given)

However, despite the intensive and overall successful promotion effort, it must be noted that participation was still very low compared to the total number of hospitals in Germany. With 25 hospitals taking part, more than twice as many facilities participated in 2018 as in the two previous years together, but this still only corresponds to 1.3% of the total of approx. 1,950 hospitals in Germany [15]. Although the proportion of participating hospitals appears to be significantly higher across all years, with a total of 272, it is important to note that many institutions take part repeatedly, meaning that the number of different hospitals is considerably smaller and is likely to be well below 10% of all German hospitals.

In order to obtain meaningful, representative data in the future, other strategies will need to be developed and implemented. The recent creation of "nutritionDay express", a pared-down version of the nutritionDay questionnaires for use in hospitals that only includes the key questions, provides option that significantly reduces the effort required from the participating institutions. However, this still might not be enough to enable the majority of hospitals to participate. In order to facilitate extensive recording of nutritional data, there is certainly a need for mandatory specifications to be put in place. These could be specifications that

are regularly checked within the framework of quality inspections. Another option would be mandatory recording of certain variables such as BMI, weight loss or food intake as part of the hospital documentation system. Furthermore, lucrative incentives within the remuneration system would be useful, as this would certainly increase the level of interest in and discussion of the topic significantly.

The key aim of this report was to gain a picture of the nutritional situation in hospitals in Germany. Various criteria were taken into consideration in order to achieve this, both on the individual level and on the structural level.

Nutritional situation on the individual level

At the level of the individual, the prevalence of malnutrition is of primary interest. Because there is unfortunately no gold standard for recording malnutrition, we have used various definitions in order to obtain the most comprehensive picture possible. Different definitions reflect different aspects of malnutrition.

BMI, which is calculated based on height and weight, objectively reflects the nutritional condition recorded at the time of the survey. In contrast, **nursing staff's assessment** is affected by subjective aspects and their clinical experience to varying degrees. According to the nurses' assessments, 12% of patients were malnourished and 12% were at risk of malnutrition.

The prevalence of malnutrition based on **BMI** is significantly affected by the threshold value chosen. Based on the stricter WHO criteria, only 5% of patients were diagnosed as underweight, but when the ESPEN classification was used, 17% were underweight (8% severely, 9% moderately). In earlier studies in hospital patients in Germany, a comparable frequency of BMI values < 18.5 kg/m^2 was reported at 4% [7, 8].

Another important indicator of malnutrition is unintentional **weight loss**. In hospitals, 17% of patients reported weight loss of more than 10%, 28% reported a loss of more than 5%, and 42% reported some extent of weight loss in the last 3 months. Unfortunately, different criteria are used for both the extent of weight loss and the time period being investigated, so the results of the various studies can only be compared to a limited extent. The results correlate to a large extent with German Hospital Malnutrition Study conducted in 2006, in which 14.5% of patients reported losing more than 10% of their body weight and 30% reported losing more than 5%, although the time period being referred to is unclear [7].

As nutritional status is largely determined by the amount of energy and nutrients consumed, the **amount of food eaten** is an important criterion for malnutrition and is therefore a key element of the nutritionDay surveys. In the hospital context, about 20% of patients stated that they had eaten only about half as much as normal or even less in the previous week; 17% reported consuming only about a quarter of the portion provided on nutritionDay, or nothing at all (◆ Figure 1). These percentages are consistent with an analysis of the global nutritionDay hospital data for the years 2006–2014 [16].

The **main reasons given for a low food intake** were lack of appetite or lack of hunger; nausea was also mentioned as an additional, illness-related reason (◆ Figure 2). Various other explanations referred to the type and quality of the food that was provided. For example, the third most common reason was "I didn't like the type of food offered", or "The food was too hot," or "The food was too cold." Although these other food-related reasons were mostly quite rare when considered separately, if we take them together, it is clear that improving the food that is provided could make it easier for many patients to eat. Ways to achieve this could include better consideration of patients' wishes and needs such as personal preferences, cultural or religious preferences, intolerances or allergies, or providing appealing meals with a modified consistency for patients with chewing and swallowing difficulties.

In 2018, a significant percentage of patients (7%) reported that they were not allowed to eat. In light of the risk of malnutrition, it is prudent to take a critical view of such prohibitions on eating and only put them in place when absolutely necessary. It is also crucial to avoid meals being skipped due to surgeries or examinations or to compensate for this by offering meals at a later stage wherever possible.

A lack of support with eating as a reason for a small food intake was only reported in a few isolated cases, but it can be assumed that many patients who need help with eating are either unwilling or unable to express this need. In a multicenter study conducted in German hospitals in 2007, a third of patients required support with eating and drinking from nursing staff on a daily basis [17].

Nutritional situation on the structural level

In hospitals, multi-professional **nutrition teams** are seen as an integral part of the medical care structure for nutrition [18]. They are responsible for the nutritional care and nutritional therapy of patients based on current scientific knowledge and they should ideally have dietetic, nursing, pharmaceutical and medical expertise. A resolution of the Council of Europe called for the establishment of nutrition teams in hospitals back in 2003 [9], but to date, only a few hospitals in Germany have such a team [19]. In comparison, the reported prevalence rates of 58% of the parti-

cipating wards with nutrition team and 56% with a specific person responsible for nutrition appear to be extremely high, but these figures are likely attributable to the selective participation of hospitals that are interested in nutrition. According to the nutritionDay surveys, nutrition teams are much more common in the rest of Europe than in Germany, which means we must take note of the fact that there is a clear lack of nutrition-related medical expertise in German hospitals [16, 20, 21].

Nevertheless, routine / regular **screening for malnutrition** takes place comparatively frequently in Germany. In 2018, it was reportedly carried out in 88% of the participating German hospital wards. Screening for malnutrition is always a key way of identifying persons who are at risk at an early stage, and is therefore crucial in terms of making sure that appropriate measures can be implemented. It is also recommended by professional associations [18, 22]. It is interesting to note that patients were weighed at admission at only half of the wards in the study. In addition, a quarter of the participating wards implement clinical nutrition without using any guidelines or standards.

It can therefore be stated that the structural quality of nutritional medicine in German hospitals and nursing homes does not meet the standards required by professional associations and internationally partly established.

Implementation of nutritional interventions

Key factors in ensuring high-quality nutritional care include not only identifying persons who are affected by or at risk of malnutrition, but also taking appropriate intervention measures once a need has been identified. One of the surprising results of the study in this regard was the relatively rare use of **fortified food** in the hospital setting. It was only used in 7% of the German patients who participated in 2018. However, the data collected in the nutritionDay project unfortunately do not allow to judge if the measures that were taken were useful and appropriate, or to estimate the extent to which patients or residents benefited from such measures. Since we have very little knowledge about appropriateness and benefits of nutritional interventions overall, this should be investigated in future studies in a targeted manner.

Conclusion

Malnutrition in hospital patients is a relevant health problem in Germany and is of great interest to those affected and to the healthcare system as a whole.

On nutritionDay 2018, up to a third of hospital patients were found to be malnourished, depending on the criteria used. Nutritional infrastructure (which includes staff with training in nutrition as well as nutritional routines) is not always in place as standard. Only 10% of the participating German hospital wards have a dietitian available and only 58% have a nutrition team. A quarter of the participating wards implement clinical nutrition without using any guidelines or standards, and only half weigh patients at admission.

> **It can be assumed that the situation in German hospitals on the whole is worse than this study reveals because it is likely that mainly institutions who are interested and active in nutritional issues took part in nutritionDay.**

Although the available data provides a great deal of information and some good starting points for reflection, representative study data is urgently required to allow a reliable assessment of nutritional infrastructures and processes in German hospitals. In addition, measures to improve nutritional care in hospitals are required in order to prevent the development of malnutrition and to adequately treat existing nutritional problems.

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Conflict of interests
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