



Original article

To what extent do structural quality indicators of (nutritional) care influence malnutrition prevalence in nursing homes?☆



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SUMMARY

Background & aims: Many residents in European healthcare institutions are malnourished, with reported malnutrition prevalence rates of up to 60%. Due to the negative effects of malnutrition it is important to optimize the quality of nutritional care. If structural quality indicators of nutritional care might improve resident care and outcome is not yet known.

The aim of this study is to explore whether structural quality indicators for nutritional care influence malnutrition prevalence in Dutch, German and Austrian nursing homes.

Methods: This study follows a cross-sectional, multi-center design. Data were collected by using a standardised questionnaire at resident, ward and institution level.

Results: Data from 214 nursing homes (NL = 133, G = 61, A = 20) were analysed. The prevalence of malnutrition varied significantly between the three countries (NL = 18.2% G = 20.1% A = 22.5%). Two structural quality indicators at ward level namely (1) the policy that the care file should include the nutritional intake for each patient and (2) having a weight measurement policy at ward level are predictive for malnutrition prevalence. Furthermore also the variable country was of influence.

Conclusions: A policy of registering nutritional intake in the file of the patient and a policy to assess the patient's weight regularly have a positive influence on malnutrition prevalence.

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1. Introduction

In European nursing homes malnutrition prevalence rates are found between 2 and 74% [1–3]. Diagnosing malnutrition is difficult due to the fact that there is no golden standard, resulting in a large variety of prevalence rates of malnutrition [4,5].

Malnutrition has been defined as a nutritional condition in which an insufficient or disproportionate intake of energy, protein, and other nutrients adversely affects tissue/body form (shape, size and composition) and function, and clinical outcomes [6]. Malnutrition has many negative consequences. It increases the chance of complications and worsens the immune function, leading to a

higher risk of infections and impairment of wound healing. Malnutrition influences the quality of life and costs of health care [7–10]. Due to the negative effects and the high prevalence rates of malnutrition it is important to optimize the quality of nutritional care as far as possible.

Donabedian's [11] framework of quality of care offers a model to investigate the quality of care. Following this model, it is not only important to focus on outcome but also on structure and process aspects to improve quality of care. Structure is defined as the attributes of settings where care is delivered, while process is defined as whether or not good medical and/or nursing practices are followed. Finally outcome involves the impact of the care on health status. Donabedian's framework implicates that improvements in structure and process of care may lead to better outcomes [11]. Different studies show that structural quality indicators such as defining professional responsibilities, guidelines, availability of nutritional advisory teams, education of both health care professionals and patients, screening and monitoring policy are of influence on the quality of nutritional care [9,12–14].

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In scientific literature, it is hard to compare international malnutrition prevalence rates due to the use of different measurement definitions, instruments and methodology. Furthermore various studies focus on different factors to investigate the structural quality indicators of nutritional care which may influence the prevalence of malnutrition. It is interesting to investigate whether structural quality indicators of nutritional care may explain differences in malnutrition prevalence rates in different countries using the same instrument and methodology.

The aim of this study therefore is to explore whether structural quality indicators for nutritional care influence malnutrition prevalence in Dutch, German and Austrian nursing homes.

The following research questions will be addressed: (1) What is the prevalence of malnutrition in nursing homes in the Netherlands, Germany and Austria? (2) Are there differences between these countries in structural quality indicators of nutritional care? (3) Which structural quality indicators of nutritional care at institution and ward level influence malnutrition prevalence?

2. Materials and methods

In 2004 the project group of the Dutch National Prevalence Measurement of Care Problems (in Dutch: Landelijke Prevalentiemeting Zorgproblemen (LPZ)) from Maastricht University started to measure the prevalence, process and relevant structural quality indicators of malnutrition in hospitals, care homes and home care [15]. Since 2008 the LPZ measurement is also performed in Germany and Austria [3,16,17]. In this study we focus on nursing homes.

2.1. Design

The LPZ follows a cross-sectional, multi-center design [17]. In this study, data collected in April 2009 and April 2010 in nursing homes in the Netherlands, Germany and Austria were explored.

2.2. Instrument

LPZ uses a standardised questionnaire at three levels: institution, ward and resident. At institution and ward level questions focused on kind of institution and wards and on structural quality indicators of nutritional care. These structural quality indicators for nutritional care were assessed with 8 questions at institutional level, and 13 questions at ward level, each with dichotomous answer categories (yes/no) (see Table 2). The indicators were developed using an international expert panel and review of the literature as relevant for a high quality of care. The questionnaire concerning the structural indicators on institutional level and ward level were filled in by the appointed institutional coordinator of the survey (quality manager, head nurse).

The original questionnaire and instruction material were developed in Dutch. For international purposes, the questionnaires have been translated into German by a professional translator. The LPZ project group discussed the translations with the German and Austrian project groups to get consensus about the translation. To make the translation fit to both German speaking countries the questionnaires have been adapted only to cultural differences like nomenclature for wards and professions present in Germany and Austria.

At resident level resident characteristics (age, gender, date of admission, comorbidity, care dependency, weight, height and unintentional weight loss) are registered. Care dependency is measured with the Care Dependency Scale (CDS) [18]. The care dependency scale consists of 15 items, with a 5 point Likert scale

and is validated for different health care settings in different countries [19,20].

The definition of malnutrition used in this study is: (1) Body mass index (BMI) ≤ 20 (age > 65), (2) unintentional weight loss (more than 6 kg in the previous six months or more than 3 kg in the last month) and (3) no nutritional intake for three days or reduced intake for more than ten days combined with a BMI between 20 and 23.9 (age > 65) [21].

This operationalization of malnutrition was furthermore tested positively for face validity and criterion validity [2].

2.3. Population

All nursing homes in the Netherlands, Germany and Austria were invited by (e)mail to take voluntarily part in the LPZ measurements. Residents of 65 years and older (or their legal representative) who gave their informed consent were incorporated in the study. Residents who refused, who were not available, were too ill, comatose or terminal were omitted from the study.

Ethical improvement for this study in the Netherlands was given by the medical ethical committee of the Maastricht University Medical Centre (MUMC). For Germany and Austria the ethical committee of the Institute of Nursing Science at Witten/Herdecke University and the medical ethical committee of the Medical University Graz gave approval to carry out the study.

2.4. Data collection

Nursing homes that participated, pointed out an internal coordinator who was responsible for the measurement. All coordinators were trained collectively by each national project group on how to perform the data collections. Furthermore they were instructed in how to use the questionnaires and the specially designed internet data-entry program. To perform the measurement in the right way, all health care professionals who would perform the data collection at the day of the measurement were trained by the institutional coordinators. The coordinators received a protocol and training package from the national project group to support them in training the health care professionals. To enhance reliability, all residents were evaluated by two health care professionals: one employed on the resident's ward and one from another ward. Inter-rater reliability has been tested for different health care settings (Cohen's kappa of 0.87) [2]. For a more in-depth description of the data collection see the article of Van Nie et al [17].

2.5. Data analyses

For the statistical analyses SPSS version 19 (SPSS Inc, Chicago, IL) was used. To describe differences in residents characteristics and the structural quality indicators of nutritional care at institution and ward level in the Netherlands, Germany and Austria, student's *t*-test, Chi-square tests, or ANOVA (with post hoc analyses Bonferroni method) and odds ratios were used. Univariate logistic regression analyses were used to describe the relation of each baseline independent variable (country: Netherlands (0), Germany (1) and Austria (2)) and all structural quality indicators at institution and ward level with the prevalence of malnutrition. The dependent variable was malnourished/not malnourished. Variables which were significant (*p*-value smaller than 0.10) in the univariate analyses were comprised in the multi-level GEE analysis with an exchangeable structure in order to build the prediction model [22]. Data were assessed for congruence with regression assumptions prior to multivariate analysis. *P*-values were based on two-sided tests, and the cut-off point for statistical significance was <0.01.

For the GEE analyses all data were analysed at patient level.

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