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Original article

Underweight and malnutrition in home care: A multicenter study

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SUMMARY

Background & objectives: This study aimed to provide representative figures about the prevalence of underweight and malnutrition among home care clients, and to determine the associated risk factors and the provided nutritional nursing interventions.
Methods: In 2012, a multicenter point prevalence study was conducted among 878 randomly selected clients from 100 randomly selected home care services across Germany. Following a standardized study protocol, demographics, nutritional assessments (Body Mass Index, Malnutrition Universal Screening Tool (MUST), Mini nutritional Assessment – short form (MNA-sf), nurses' clinical judgment on nutritional status) and interventions were assessed. Common nutritional risk factors for underweight and malnutrition were analyzed in a logistic regression model.
Results: Malnutrition figures varied between 4.8% (MNA-sf) and 6.8% (MUST), underweight between 8.7% (BMI < 20 kg/m^2) and 10.2% (clinical judgment). Missing values were high in both malnutrition assessments (MNA-sf 48.8%, MUST 39.1%) due to a lack of information on many clients' loss of weight within the past 3–6 months. Regular weighing was performed in 33.6–57.3% of all clients, depending on weight and nutritional status. Mental overload (OR 8.1/4.4), needs help with feeding (OR 5.0/2.8) and loss of appetite (OR 3.6/3.9) were highly associated with malnutrition/underweight.
Conclusion: Malnutrition and underweight are important issues in home care clients. Regular weighing should be performed in all home care clients so that a potential weight loss can be detected in time.
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1. Background & aims

The development of malnutrition is a long-term and often insusceptible process. The first symptoms are rather unspecific, like tiredness, listlessness, lack of concentration, functional deficits or increased susceptibility to infections [1]. Therefore, an early detection is difficult to realize, particularly in the community sector with rare contacts to health professionals and without a routine screening system. The consequences of malnutrition result in various bodily dysfunctions, thus affecting daily activities, increasing complication rates, morbidity and even mortality of the affected persons [2]. They also account for additional hospital admissions or prolonged hospital stay and thus produce direct as well as indirect costs [3,4].

Several treatable and untreatable risk factors for under- and malnutrition are known and can be divided into cognitive or psychosocial risk factors [5], disease related risk factors [6], and environmental conditions [7]. Among the elderly community dwelling population, a lot of these risk factors are prevalent; because they experience age related changes (e.g. decline of oral health), they often suffer from multimorbidity and polypharmacy which lead to a loss of appetite or other side effects, and they may be challenged with insufficient nutritional supply in their nearer environment.

According to European guidelines, health care facilities have to implement policies to identify people at risk of malnutrition and to appropriately plan their care according to nutritional aspects [8]. A comprehensive screening should imply the nutritional intake, weight and weight development, BMI (body mass index), and typical nutritional risk factors. Thus, it has to be emphasized that malnutrition has to be distinguished from underweight since it can happen even in obese individuals [9].

Guidelines on enteral nutrition for geriatric patients advise the use of oral nutritional supplementation (ONS) for undernourished patients or patients at risk of malnutrition as well as for frail elderly [10]. The first nursing guideline for oral nutrition in Germany,

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published in 2009, additionally recommends the consultation of nutritional experts, counseling of patient and relatives, control of food and drink intake, and regular weighting [11].

International publications confirm a lack of valid data for the home care sector, compared to the intramural sector, but also assume a substantially high number of affected people [12]. Therefore, the purpose of this study was to provide representative figures about the prevalence of underweight and malnutrition among home care clients and to determine the associated risk factors and the provided nutrition related nursing interventions.

2. Material and methods

A multicenter cross sectional study was conducted in German home care services during the summer of 2012. From the total of all registered German home care services (>13,000), we chose randomly selected services in each state and asked for their interest in participating in the study. Participating institutions were rewarded with a signed certificate of participating in an empirical scientific nursing research project which proved beneficial for their marketing and with a general expense allowance of 100 Euro. We were aiming for a participation of 9 randomly selected services in each state. The ones deciding to participate in the study were sent information and study material (survey questionnaires, manuals, definitions, diagnostic and assessment scores and images e.g. different pressure ulcer categories). Within each home care service, 9 randomly selected patients were planned to be included into the study.

2.1. Study participation

Institutions with less than 10 clients were not eligible for the study. Only patients older than 18 years were included into the study. Patients were asked for oral informed consent; in case of unconsciousness or cognitive impairment, the patient's next of kin or legal representative had to agree to his or her participation in the study. Approval for conducting the study was granted by the Berlin Medical Association's Ethics Commission (Eth-873-262/00).

2.2. Variables

Socio-demographic data like age, sex, and social living status as well as the Barthel Index Item feeding for assessing the clients' care dependency regarding nutritional intake were applied [13]. The dependent variable underweight was determined by either the BMI (cut-off 20 kg/m^2) or a clinical judgment of the health care professionals stating whether or not the individual should be classified as cachectic. The dependent variable malnutrition was determined by applying the Mini Nutritional Assessment short form (MNA-sf), and the Malnutrition Universal Screening Tool (MUST) [8]. Both instruments have been tested for validity [14] and reliability [15]. The prospective validity of MNA-sf is assumed to be of the same quality as the validity of the MNA-sf [16]. The BMI was expressed in means as well as in dichotomous BMI-groups (cut-off 20 kg/m^2). Regarding the clinical judgment, the health care professional had to differentiate between cachectic or non-cachectic. The MUST and the MNA-sf were divided into three groups (normal/low risk = 0 points [MUST] and 12–14 points [MNA-sf], middle risk/at risk = 1 points [MUST] and 8–11 points [MNA-sf] and high risk/malnourished/underweight $\geq$ 2 points [MUST] and 0–7 points [MNA-sf]). Furthermore, risk factors for underweight and nutrition related interventions were recorded.

2.3. Data sources and measurement methods

Questionnaires and information material were revised, following a pretest in four home care services. According to the standardized study protocol, data were collected in the context of a regular home visit by head to toe body examination, observation and questioning and by consulting medical records. To each home care service, one fully trained nurse was assigned and responsible for the data collection. The collection of data took 20–30 min per care-dependent person.

2.4. Sample size

The size of the sample was calculated according to available reference data from other studies, expecting a 70%-response rate (respectively 900 participants) and a point estimate of about 15% malnourished clients. This would limit a 95% confidence interval to between 12.8 and 17.5%. This was considered to be sufficiently precise for the purpose of this study.

2.5. Statistical analysis

Due to the stratified random sample design and the different response rate in each federal state, each client data set was weighted to receive representative results for all German home care clients. The calculation of the weighting factors was based on an official governmental statistical report published by the Federal Statistical Office of Germany [17]. All calculations and statistical analyses have been made using SPSS© for Windows Version 21. The initial data file was checked for inconsistencies and outliers as well as normality. Relative frequencies were calculated for nominal (sex, BMI cut-off <20 kg/m^2, nutritional risk factors, nutrition related nursing interventions) as well as ordinal variables (MNA-sf-items, MNA-sf-groups, MUST-items, MUST-groups). For the numerical variables (age, BMI, duration receiving home care), means with standard deviation (sd) were calculated. As an indicator for the precision of the prevalence rates, 95%-confidence intervals (95% CI) were calculated [18]. Additionally, a binary logistic regression model was developed to quantify the impact of the investigated risk factors on the presence of underweight (defined as either BMI < 20 kg/m^2 or cachectic according to clinical judgment) and malnutrition (defined as at risk of malnutrition or malnourished, measured by the MNA-sf or at middle or high risk according to the MUST). For each of the 14 risk factors, p-values, odds ratios (OR) and 95% CI were described. Finally, the frequencies were shown stratified for nutritional status (under- and malnourished) for the 13 nutrition-related nursing interventions that were provided.

2.6. Sample

A total of 878 clients in 100 home care services in 16 German federal states could be included in the data analysis. Within the participating institutions, the response rate was 97.5%. The response rate on the institutional level was (100/(9*16) *100) = 69.4%. In average, clients' age was 78.5 years (sd 12.2). Of all participating clients, 62.9% were female. At the time the study was conducted, the mean time clients received nursing service at home was 3.1 years (sd 2.96). The mean BMI was 27.0 kg/m^2 (sd 6.6).

3. Results

Figure 1 displays that according to the MUST, 4.2% of home care clients were at middle risk and 6.8% at high risk for malnutrition. The categories of the MNA-sf indicate that 20% of all clients were at risk and 4.8% were malnourished. For 39.1% of all clients, there were

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