

## A Cross-Sectional Survey of Evidence-Based Practices Identifies Gaps in Nurses' Knowledge of Geriatric Malnutrition

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**Abstract:** *Malnutrition is a common problem for elderly patients and is associated with adverse clinical outcomes. This cross-sectional descriptive study examined registered nurse's knowledge of evidence-based nutrition interventions for geriatric patients in the medical-surgical setting. Identified knowledge deficits provide a focus for educational efforts across all levels of nursing experience.*

**Keywords:** *malnutrition, geriatric, nursing knowledge deficit, malnutrition assessment, cross-sectional survey of nutritional care*

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### 1. INTRODUCTION

The world's population is rapidly aging with estimates that in the first five decades of the 21st century the proportion of the world's population over 65 will nearly double from about 11% to 22%, with the absolute number of older adults expected to triple from 605 million to 2 billion over this time period.[1] Adults, age 65 and over, are the greatest consumers of healthcare with declining health often requiring hospitalization due to co-morbid conditions, sedentary lifestyle, polypharmacy, and poor nutritional status.[1]

Adequate nutrition is an essential component of an individual's well-being and affects every aspect of their health.[2] Some adults tend to be more susceptible to developing malnutrition than others; one such population being the elderly hospitalized patient. Malnutrition, a common problem for these patients, is associated with adverse clinical outcomes as well as increased healthcare costs.[3] For the purpose of this study malnutrition was defined as a decline in lean body mass that has the potential of leading to functional impairment at multiple levels.[4] Because this study pertains to the elderly patient, it is also important that this specific population is defined. For the purpose of this study the elderly, or geriatric, patient refers to anyone 65 years of age and older.[1]

Evidence suggests that malnutrition often goes unrecognized, yet up to 53% of the elderly admitted to the hospital are affected.[5] Furthermore, the nutritional status in this population frequently deteriorates during a single hospital stay.[5] Research has demonstrated that malnourished hospitalized patients are 4 times more likely to develop a pressure ulcer and have 2.5 times the risk for surgical site infection than those who receive proper nutrition.[6] One study validated that 30–50% of all hospitalized patients have some degree of malnutrition contributing to increased morbidity, length of hospital stay, complication rates, hospital re-admission rates and subsequently, higher hospital and rehabilitation costs.[7] Although nutritional deficits can occur prior to the patient's admission, it is

vital for patients to receive early, appropriate nutritional screening and assessment in order to detect those who are already malnourished or are at risk of becoming malnourished.[7]

One important way to enhance the patient's recovery is to ensure that the nurse is able to recognize a potential malnutrition problem early in the hospitalization by being attentive to basic physical assessment clues. These signs include an emaciated appearance or being underweight, muscle wasting or loss of subcutaneous fat, poor coordination, muscle weakness, fatigue, thinning hair or hair loss, dry skin with poor coloring, patchy dermatosis, dry, cracked lips, a swollen red tongue, poor oral health, impaired wound healing, or reduced resistance to infection.[8] The literature suggests that nurses have limited knowledge of nutrition and lack the nutritional assessment skills to properly assess patient nutritional status.[3,9] An investigation of nurse's knowledge regarding evidence-based nutrition interventions for geriatric inpatients has not been conducted in our hospital's medical-surgical nursing environment.

### 1.1 Purpose

The purpose of this study was to describe nurses' understanding of malnutrition in the elderly and to identify knowledge deficits related to assessment and appropriate nursing interventions for the malnourished elderly. By evaluating the relationship between years of nursing experience and the ability to recognize malnutrition in the elderly inpatient, we sought to determine the areas of nutrition education most needed by bedside nurses.

## 2. METHODS

The study underwent administrative review and received Exempt status approval by the hospital Institutional Review Board. This cross-sectional descriptive study used a survey method to answer the following research question: what knowledge and skills are needed for registered nurses (RNs) to properly assess the geriatric patient as being at risk for malnutrition? The pen and paper survey *Nurse's Knowledge Regarding Evidence-Based Nutrition Interventions for Geriatric Patients* was created from the published guideline, *Evidence-based Geriatric Nursing Protocols for Best Practice*. [10] The survey was tailored to institution-specific nursing practices. Existing validated instruments were used as a guide for development of the new survey. [11,12] The survey was divided into three sections to address Assessment (A), Intervention (I), and Understanding (U); all dimensions described in the literature and pertinent to nutritional care of geriatric inpatients on a medical-surgical unit. The 22-item survey used a five-option Likert-type scale with the anchors of 1=Strongly agree and 5=Strongly disagree for responding to the survey statements (See Table 1). All items in the survey were positively worded. The survey included the following demographic variables: age, gender, licensure category, and years of nursing practice. The unit of analysis was the individual nurse. When distributing the surveys, the Principal Investigator informed the nurses that the term "older patients" referred to the population over the age of 65. The setting was a level II military teaching hospital in the Northwestern U.S. with approximately 150 nurses from three medical-surgical units available to complete the survey. A cover sheet detailed the purpose of the survey, the expected time required to complete the survey, and explained that completion of the survey implied their consent to participate in the study. Nurses were informed that all responses would remain confidential, results would be aggregated, and no identifying information was being collected. They also had the option not to answer specific questions if desired. Nurses that chose to participate had 3 weeks to complete the survey and place it in a locked box on each of the units. A three week period was chosen because it allowed sufficient time for nurses on all shifts, who may be on vacation or otherwise not at work for a period of time, to return and complete the survey.

### 2.1 Data Analysis

Descriptive statistics (means with standard deviations, frequencies, and percentages as appropriate), non-parametric one-way analysis of variance, and Pearson's correlation coefficients (r) were used to report the findings. Survey data represent scores matching the Likert category selected, e.g. the selection of 1 = Strongly agree, assigned a point value of 1 to that answer. Scores ranged from the minimum of 22 representing all Strongly agree, to a maximum of 110 or all Strongly disagree. The means score was calculated for each question and the composite scores for each dimension. Non-parametric techniques were used to compare mean composite scores by years of experience categorized as 3 years or less, 4-10 years, and greater than 10 years. Correlational techniques were used to examine the relationship between years of nursing experience and each sub-category:

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Assessment, Intervention, and Understanding. Statistical analysis was performed with the IBM SPSS® software, version 22.0 (Chicago, IL).

**Table 1.** Nurse's knowledge regarding evidence-based nutrition interventions for geriatric patients

Question	RN Mean Score (n=47)
1. As a nurse, my role includes performing a nutrition assessment and implementing a nutrition care plan to optimize patient outcomes by preventing loss of lean body mass, skin breakdown, or wound infections.(A)	1.89
2. Protein energy malnutrition is common in hospitalized older adults; it is reversible with patient-centered evidence-based nutrition interventions(U)	1.85
3. Food intake, digestion, and the ability to absorb nutrients is affected by age-related factors and various disease conditions(U)	1.30
4. The Mini-Nutritional Assessment (MNA) is a valid and reliable tool to identify risk for malnutrition in the older adult. (A)	2.66*
5. Drugs can modify the nutrient needs and metabolism of older people(U)	1.74
6. Areas of specific assessment for older adults include loss of subcutaneous fat, muscle wasting, body mass index, and dysphagia(A)	1.57
7. Emphasis on the oral exam is an important part of the physical assessment of older adults(A)	1.72
8. Height and weight should be obtained through direct measurement as patient recall is unreliable(A)	1.53
9. Height should never be estimated or recalled due to shortening of the spine with advanced age(U)	1.96
10. Weight loss of 10 lbs over a 6-month period, whether intentional or unintentional, is a critical indicator for further assessment(A)	2.28*
11. Body mass index below 22 is a sign of undernutrition(U)	3.09*
12. Daily caloric requirements for healthy older adults include 30 kcal/kg body weight and 0.8 to 1.0 g/kg of protein per day(A)	2.66*
13. Daily weights are useful for monitoring fluid status (I)	1.66
14. Caloric, carbohydrate, protein, and fat requirements may differ depending on degree of malnutrition and physiological stress(U)	1.57
15. It is a good idea to encourage family members to visit at mealtimes and to bring favorite foods from home when appropriate(I)	1.55
16. In older hospitalized adults albumin levels may be a better indicator of prognosis than nutritional status(A)	2.40*
17. It is a good idea to use oral supplements between meals but not during the hour preceding meals, or at bedtime(I)	2.53*
18. It is a good idea to include supplements with the medication regimen(I)	2.49*
19. Using sip-style/juice box supplements that can be opened by the patient will promote consumption(I)	2.04*
20. Documentation of all oral supplements, snacks,and portion of meal consumed are best practices for monitoring nutrition status in older adults(I)	1.70
21. Oral supplements available to MAMC inpatients include Carnation instant breakfast, Magic Cups, Scandishake, and Boost Plus(I)	2.17*
22. Refeeding syndrome is a relevant concern as all older adults with chronic, co-morbid conditions and poor nutrient intake prior to aggressive nutritional repletion are at risk (U)	2.43*

Content Category: (A) Assessment, (I) Intervention, (U) Understanding

\* Identified need for further education

### 3. RESULTS AND DISCUSSION

Forty seven RNs and 5 LPNs (n=52) completed the survey for a 34.7% response rate. In the military, LPNs have a very valuable role as a team member delivering patient care. They perform assessments and contribute to the plan of care under RN supervision. However, for this study very few LPNs were available to complete the survey and thus they were excluded to maintain a more homogeneous sample. A large proportion of the RNs were female (67.3%) and mean age was 31 ( $\pm 9$ ) years. The mean number of years of nursing experience was 5.5 ( $\pm 7.4$ ) with the majority (n=31, 66%) having 3 years or less of nursing experience.

The three survey sub-categories, Assessment, Intervention, and Understanding, had the following mean (SD) scores: Assessment 16.7 (3.1), Intervention 14.1 (2.5), and Understanding 13.9 (2.5). The Kruskal-Wallis Test was used to compare scores for the three sub-categories (Assessment,  $p = .29$ , Understanding,  $p = .82$ , and Intervention,  $p = .54$ ) across the three age groups and no differences in scores between groups were identified. The relationship between the variable “years of nursing experience” and the three sub-categories was also analyzed using Pearson product-moment correlation coefficient. Preliminary analyses found no violation of the assumptions of normality, linearity, and homoscedasticity although outliers existed due to only 2 RNs having 30 years of experience. Results indicate a weak, negative correlation without statistical significance between years of nursing experience and Assessment,  $r = -.10$ ,  $n = 47$ ,  $p = .50$ ; Intervention,  $r = -.06$ ,  $n = 47$ ,  $p = .70$ ; and Understanding,  $r = -.09$ ,  $n = 47$ ,  $p = .55$ . The inverse relationship suggests that perhaps fewer years of nursing experience relates to more current knowledge regarding evidence-based nutrition interventions for geriatric patients. However, this was not confirmed in the study population. Mean scores were consistently higher for nurses with fewer years of experience in 2 of the 3 sub-categories: Assessment and Understanding. The coefficients of determination were  $< 1\%$  for each variable indicating very little variance was shared by the variables. Table 1 lists the questions on the survey and the mean response score for each question. As determined by a team of clinical experts, questions with mean scores greater than 2 identified areas as needing further education. Four of the questions fell in the Assessment sub-category and included using an appropriate risk assessment tool, recognizing weight loss as a critical indicator, acknowledging albumin levels as a prognostic indicator, and knowing adult normal daily caloric requirements. Four questions in the Intervention sub-category provided a target for education needs related to oral supplementation. Two questions from Understanding indicate the need for education on body mass index parameters and refeeding syndrome.

This study reports the results of 47 medical-surgical RNs who agreed to complete the survey *Nurse's Knowledge Regarding Evidence-Based Nutrition Interventions for Geriatric Patients*. This survey evaluated their understanding of malnutrition in the elderly and their level of knowledge related to assessment and nursing interventions for the malnourished elderly. The study was unable to demonstrate any relationship between years of nursing experience and survey scores. Interestingly, the category “years of nursing experience” was inversely related to survey item scores for the three dimensions of understanding, assessment, and interventions for malnutrition. Although this inverse relationship lacks statistical significance perhaps younger or more recent graduates from nursing school acquired the knowledge for understanding and assessing malnutrition in the hospital setting in their curriculum. These nurses are capable of educating their co-workers, as current nursing programs teach evidence-based interventions that challenge older practices. The highest scores across all levels of experience, suggesting less knowledge, were in the categories of Assessment and Intervention; educational efforts should be focused on the content of these sub-categories (See Table 1). These findings are similar to the results reported by Kim and Choue (2009) who used a questionnaire distributed across one Korean medical center and found that nurses ( $n=221$ ) with an average of 9 years of experience and over 65% with a master's degree possess limited nutritional knowledge and poor assessment skills needed in the clinical setting.[9] In another study conducted in Scandinavian countries by Mowe et al. (2008) self-reported nutritional knowledge was notably deficient for nurses and doctors.[13] In the sample of 4,512 clinicians from Denmark, Sweden, and Norway, 26% agreed that it was difficult to identify undernourished patients, 39% lacked nutrition assessment skills, and 60% agreed that it was difficult to coordinate nutritional care of patients. Insufficient knowledge was the most common cause of inadequate nutritional practice.[13]

The results of this study reveal a concerning knowledge deficit in nutritional assessment of the geriatric patient. Malnutrition is considered to be multifactorial in origin and is associated with many risk factors, intrinsic and extrinsic.[14] Intrinsic factors that place the geriatric patient at risk for developing malnutrition result from normal physiological changes that occur in the aging human body. These dietary considerations include chewing or swallowing difficulties, gastrointestinal or endocrine disorders, decreased appetite, inflammatory diseases, chronic diseases, alcoholism, malignancies, and cognitive disorders.[14] Other key issues include decline of fine motor skills to be able cut food and manage eating utensils, needing assistance with feeding, and depression. It is critical to perform a comprehensive nutrition assessment upon admission in order to consult hospital resources such as dietitians and occupational therapists to ensure optimal dietary intake.

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The most common extrinsic risk factors in the elderly patient include whether or not the patient eats alone, and what nutritional requirements need to be increased with aging and wounds.[15] One study estimated that eating alone can reduce appetite by 30-44%.[15] With regard to nutritional requirements, elderly adults with intact skin require a higher intake of dietary protein (1 to 1.5 g/kg of body weight) than younger adults (0.8 g/kg of body weight) in addition to an increase in the nutrient density of their diet due to a decrease in calorie needs.[15] One simple intervention is supporting patients when eating their meals. This can be done by feeding them if they need assistance, encouraging them to eat, and providing high protein supplements if indicated. These interventions can help to maintain or improve the patient's nutritional status and contribute to a more positive overall hospital experience. Once the patient is ready for discharge, resources to assist with going to the grocery store, purchasing food, developing meal plans and aiding in meal preparations may be beneficial in preventing deterioration in the nutritional status of the older adult.

While no universally agreed upon method when trying to identify malnutrition exists, implementing any validated method can assist in evaluating a patient's nutritional status.[16] Two widely used tools available for assessing the patient's nutritional status, include the Mini Nutritional Assessment (MNA) and the Nutritional Risk Screening 2002 (NRS).[17] The MNA is a nutritional screening tool used to identify patients 65 and older who are malnourished or at risk of malnutrition. The NRS 2002 is another tool that has been recommended by the European Society for Clinical Nutrition and Metabolism for the same population.[17] In most healthcare facilities today, decision support tools can be selected using expert consensus. These tools can then be incorporated into the electronic medical record to ensure consistent application in order to achieve the best possible patient outcomes.

### **3.1 Limitations**

The study has several limitations. The survey was administered only once without follow-up. It was distributed to a convenience sample of nurses working on the medical-surgical units in one medical center. The response rate was relatively low at 34% but as previously stated, there was only one distribution of the pen and paper survey. The military setting is somewhat unique in that there is wide disparity between the large number of young military nurses with limited experience and the small number of federal civilian nurses with many years of experience. The demographics of this sample limit the generalizability of the findings. Lastly, the study was not designed to address the survey development and testing but content was extracted from national guidelines describing evidence-based interventions for nutritional care of the elderly. A future study will consider more rigorous testing of the survey to establish validity and reliability indices across a broader sample of nurses.

## **4. CONCLUSION**

Using a one-time survey developed from a literature review, this study identified knowledge gaps related to geriatric malnutrition in the medical surgical nursing setting in a single institution. We learned that the education of nurses working with the elderly population must focus on evidence-based strategies that help identify patients at risk for malnutrition upon admission, as well as those at greatest risk for developing malnutrition during the hospital stay. Evidence suggests that the nutritional priority for older adults focuses on preventing protein-energy malnutrition.[1] Therefore, nurses have an opportunity to impact the outcomes for hospitalized elderly patients using assessment, understanding, and implementation of best practices that specifically support optimal protein intake, and healing and recovery in general.

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