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KNOWLEDGE AND PERCEIVED QUALITY OF NUTRITION CARE AMONGST NURSES

ABSTRACT. Mizrahi Aviva Alagem, Waszyńska Katarzyna, *Knowledge and Perceived Quality of Nutrition Care amongst Nurses* [Wiedza z zakresu opieki żywieniowej i postrzegalna jakość tej opieki u pielęgniarzek]. *Studia Edukacyjne* nr 58, 2020, Poznań 2020, pp. 291-313. Adam Mickiewicz University Press. ISSN 1233-6688. DOI: 10.14746/se.2020.58.16

Purpose: This study was conducted on nurses from The Sheba Medical Center. The purpose of the study was to investigate nurses' evaluation of the importance of a nutrition assessment, (b) nurses' knowledge of nutrition care and (c) nurses' evaluation of the quality of nutrition care in their department. **Design:** The study was a quantitative correlational study performed in a university-affiliated, teaching hospital. **Methods:** Data were collected via a digital questionnaire through head nurses, from 203 nurses and analyzed by frequencies, means and Pearson correlations, independent t-tests, one-way ANOVA and stepwise such as the ability of patients to feed themselves, chew and swallow, multiple linear regression were performed to determine predictors observing whether a patient finishes a meal and offering assistance of nurses' responses where needed. **Findings:** Importance of nutritional assessment is positively and significantly correlated to knowledge of nutritional care and quality of nutritional treatment. Female nurses' knowledge is significantly higher than male. Senior nurses' knowledge is higher than less senior nurses. Nurses who participated in emergency care training have a significantly higher level of knowledge than nurses who did not participate in this course. Knowledge of nutritional care is not significantly correlated to quality of nutritional treatment. It is important to introduce the role of nurses regarding nutritional care within their departments to doctors and dietitians, as well as involving them in building the intervention course. **Conclusions:** These findings highlight the importance of checking the quality of nurses' educational knowledge and improving it through an intervention with specified training surrounding knowledge regarding nutrition, including learning and training.

Key words: nutritional education, knowledge about nutrition, malnutrition, nutrition assessment, nurses

Introduction

Nutrition is an important aspect of human condition, both in health and in disease. Human needs are common to all people and meeting such needs is essential for the health and survival of mankind. Abraham Maslow's landmark theory was his hierarchy of needs.¹ The most basic level of needs in Maslow's hierarchy includes the basic needs for survival such as air, water, food, and shelter. Correct nutrition prevents sickness and death and prolongs life.²

Nutritional education is an important part of health education. Health education in the context of nutrition will provide better nutritional support. It may include direct patient care, research relevant to nutritional support therapy, teaching, and administrative responsibilities. Nutritional education will be an important part of integration standards to assure effective nutritional care for patients in all healthcare settings who are in need to nutritional support therapy and prevent malnutrition.³

Malnutrition is a growing issue and one of the most significant complications that can occur during hospitalization, occurring at a rate of 30-40% of patients.⁴

Malnutrition is defined as a condition that results from lack of sufficient nutrition. Malnutrition may predispose a person to a variety of serious illnesses. Conversely, a serious illness may serve as an instigator to a nutritional crisis.⁵ Malnutrition is one of the most common and devastating conditions suffered by elderly people. Complications that result from malnutrition include weakness of the respiratory muscles, pulmonary infections, and an increased risk of mortality.⁶

Hospital staff must be able to recognize the risk factors for malnutrition, patients at risk of refeeding syndrome, and the optimal route for nutritional

¹ A.H. Maslow, *Maslow Hierarchy of Needs Theory*, 1943.

² A.E. Zahav, *Nutritional needs of communicative patients and patients with impaired communication in Israel (Doctoral dissertation)*, Anglia, Ruskin University, 2007.

³ R.A. DiMaria-Ghalili et al., *American Society for Parenteral and Enteral Nutrition (ASPEN) Board of Directors and Nurses Standards Revision Task Force, Standards of practice for nutrition support nurses*, *Nutrition in Clinical Practice*, 2007, 22(4), p. 458-465.

⁴ C. Kubrak, L. Jensen, *Malnutrition in acute care patients: a narrative review*, *Int J Nurs Stud*, 2007, 44(6), p. 1036-1054; S. Felder, C. Lechtenboehmer, M. Bally et al., *Association of nutritional risk and adverse medical outcomes across different medical inpatient populations*, *Nutrition*, 2015; C. Aeberhard et al., *Simple training tool is insufficient for appropriate diagnosis and treatment of malnutrition: a pre-post intervention study in a tertiary center*, *Nutrition*, 2016; F. Gomes, P. Schuetz, L. Bounoure et al., et al., *ESPEN guidelines on nutritional support for polymorbid internal medicine patients*, *Clin Nutrition*, 2018.

⁵ R. Srikanth et al., *A variable-length genetic algorithm for clustering and classification*, *Pattern Recognition Letters*, 1995, 16(8), p. 789-800.

⁶ R.J. Grieve, A. Finnie, *Nutritional care: implications and recommendations for nursing*, *British Journal of Nursing*, 2002, 11(7), p. 432-437.

support. Education of patients and their caregivers about nutritional support must begin before discharge and include coordination of care with outpatient facilities. As with all other aspects of discharge, it is the hospitalist’s role to assure smooth transition of the nutritional care plan to an outpatient setting.⁷

Tappenden et al present a care model to drive improvement, emphasizing the following six principles: (1) create an institutional culture where all stakeholders value nutrition; (2) redefine clinicians’ roles to include nutrition care; (3) recognize and diagnose all malnourished patients and those at risk; (4) rapidly implement comprehensive nutrition interventions and continued monitoring; (5) communicate nutritional care plans; and (6) develop a comprehensive discharge nutritional care and education plan.⁸

Table 1

The Nutritional Role of The Multidisciplinary Team

<p>Principle 1: Create Institutional Culture</p>	<ul style="list-style-type: none"> • Know the facts – nutrition improves patient outcomes • Support adequate and appropriate nutrition intervention • Identify motivated champions among hospital stakeholders
<p>Principle 2: Redefine Clinicians’ Roles to Include Nutrition</p>	<ul style="list-style-type: none"> • Empower dietitians • Secure nurse and physician leadership • Engineer teamwork (eg, daily team huddles) to include nutrition
<p>Principle 3: Recognize and Diagnose ALL Patients at Risk</p>	<ul style="list-style-type: none"> • Assure accountability for malnutrition identification • Use valid screening tool and criteria to assess/diagnose malnutrition • Include fields for malnutrition characteristics in EHR
<p>Principle 4: Rapidly Implement Interventions and Continued Monitoring</p>	<ul style="list-style-type: none"> • Establish policy to feed patients within 24h of ‘at-risk’ screen • Create EHR prompt for diet order when ‘at-risk’ screening data entered • Monitor patient’s food and oral nutrition supplement consumption
<p>Principle 5: Communicate Nutrition Care Plans</p>	<ul style="list-style-type: none"> • Leverage EHR to standardize nutrition documentation • When present, ensure coding of mild, moderate, or severe malnutrition as complicating condition to primary diagnosis • Ensure care discussions include nutrition
<p>Principle 6: Develop Discharge Nutrition Care and Education Plan</p>	<ul style="list-style-type: none"> • Ensure nutrition care plan incorporated into the discharge plan • Educate patient and their families • Communicate with the patient’s health care providers

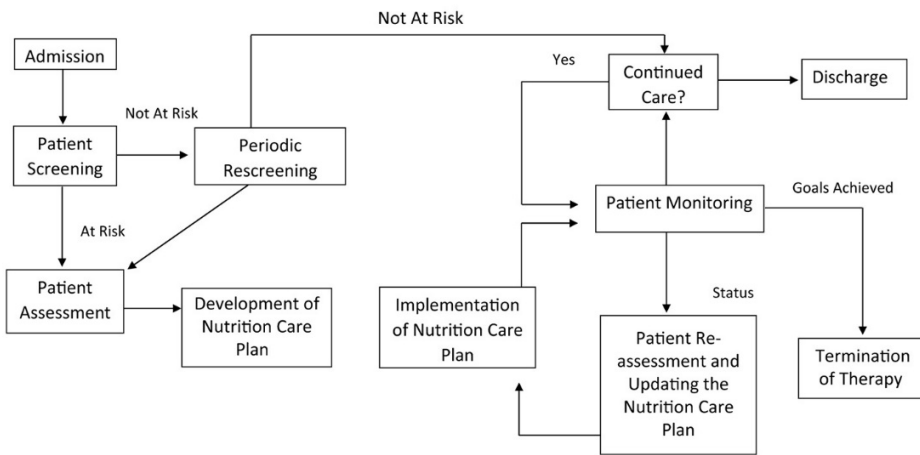
K.A. Tappenden et al., *Critical role of nutrition in improving quality of care: an interdisciplinary call to action to address adult hospital malnutrition*, Journal of the Academy of Nutrition and Dietetics, 2013, 113(9).

⁷ L.L. Kirkland et al., *Nutrition in the hospitalized patient*, Journal of Hospital Medicine, 2013, 8(1), p. 52-58.

⁸ K.A. Tappenden et al., *Critical role of nutrition in improving quality of care: an interdisciplinary call to action to address adult hospital malnutrition*, Journal of the Academy of Nutrition and Dietetics, 2013, 113(9), p. 1219-1237.

The American Society for Parenteral and Enteral Nutrition (A.S.P.E.N.) is a professional society of physicians, nurses, dietitians, pharmacists, nurse practitioners, physician assistants, other allied health professionals, and researchers. A.S.P.E.N. envisions an environment in which every patient receives safe, efficacious, and high-quality nutrition care. A.S.P.E.N.'s mission is to improve patient care by advancing the science and practice of clinical nutrition and metabolism. These combined Standards for Nutrition Support: Home Care and Alternate Site Care are an update of the 2005 and 2006 standards.⁹

Table 2



Nutrition Care Algorithm

S.M. Durfee et al., *Home and Alternate Site Care Standards Task Force*, American Society for Parenteral and Enteral Nutrition (ASPEN). ASPEN standards for nutrition support: home and alternate site care, *Nutrition in Clinical Practice*, 2014, 29(4).

Jefferies et al. performed a study, through which a literature search located 147 relevant articles. Forty articles were identified as being within the scope of the clinical question. Most were reports of audits or observation studies. The dominant themes were developed into standards that assisted nurses in supporting the oral nutrition of their patients. These included the following: a focused mealtime, management of mealtime environments, management of

⁹ S.M. Durfee et al., *Home and Alternate Site Care Standards Task Force*, American Society for Parenteral and Enteral Nutrition (ASPEN). ASPEN standards for nutrition support: home and alternate site care, *Nutrition in Clinical Practice*, 2014, 29(4), p. 542-555.

staff mealtimes and a designated nutrition support nurse in each clinical area to monitor and evaluate the implementation of the polic.¹⁰

Nursing is the protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through the diagnosis and treatment of human response, and advocacy in the care of individuals, families, communities, and populations. Nutrition support nursing is a professional nursing specialty that focuses on the protection, promotion, and optimization of nutrition health and functional abilities, prevention of nutrition-related illness and injury, alleviation of suffering through the diagnosis and treatment of nutrition-related human response, and advocacy in the care of individuals, families, communities, and populations with known or potential nutrition alterations.¹¹

The results of a study by Boeykens et al. show that the described competencies reflect the advanced role and clinical expertise of a Nutrition Support Nurse. She can make a significant contribution to the overall quality of nutritional care, uncover the multidimensional aspects of nutrition, monitor effectiveness/ appropriateness of nutritional therapy, and improve clinical outcomes. The conclusions of the study include that a Nutrition Support Nurse can incorporate nutrition nursing in the overall nutrition support, acting as an important player for users, carers and the healthcare organization in general.¹²

The Waitemata District Health Board lists the purpose of a "Clinical Nurse Specialist - Nutrition Support Team" as including: (1) Complete the professional profile of the Nutrition Support Team, along with physician, dietitian and pharmacist; (2) Advanced practice nursing role that focuses on care delivery for patients requiring specialized nutrition support (oral, enteral & parenteral); (3) Provides assessment and care management of patients requiring specialized nutrition support; (4) Assessment & care management of patients with feeding tubes - including tube selection, method of insertion, troubleshooting & replacement; (5) To provide specialist nursing care and expertise both in direct care delivery and in support to other staff in the management of a patients requiring nutrition support.¹³

¹⁰ D. Jefferies, M. Johnson, J. Ravens, *Nurturing and nourishing: the nurses' role in nutritional care*, Journal of Clinical Nursing, 2011, 20(3-4), p. 317-330.

¹¹ R.A. DiMaria-Ghalili et al., *American Society for Parenteral and Enteral Nutrition (ASPEN) Board of Directors and Nurses Standards Revision Task Force, Standards of practice for nutrition support nurses*, Nutrition in Clinical Practice, 2007, 22(4), p. 458-465.

¹² K. Boeykens, A. Van Hecke, *Advanced practice nursing: Nutrition Nurse Specialist role and function*, Clinical Nutrition ESPEN, 2018, 26, p. 72-76

¹³ Waitemata District Health Board, June 2017: Clinical Nurse Specialist - Nutrition Support Team - Position Description. <http://www.aucklandhealthjobs.com/resources/pdf/>

Quality of patient care

Quality of patient care is measured by the nurse's ability to provide the care, and the understanding that carrying out the nurse's role requires depth, which is the ability to integrate the patients' abilities and needs. The ability to understand when the patients are more attentive, understanding, and manage to absorb the information and instructions provided.

The nurses' quality of care, personal progress, and roles are influenced by education and knowledge, social changes, political influences, social movement activities, and ideological and philosophical changes. The protocols on health care are built on governmental decisions which define goals and objectives for the role of the nurses.¹⁴

The Israeli Health Administration established professional demands for nutritional care of hospitalized patients, which define that distribution of food and other roles, such as oral feeding, will be carried out by "a person trained to do this task in accordance with internal guidelines of the hospital where they work".¹⁵

Purpose of research and Participants

The purpose of the study was to investigate nurses' evaluation of the importance of (a) nutrition assessment, (b) nurses' knowledge of nutrition care and (c) nurses' evaluation of the quality of nutrition care in their department.

The questionnaires were handed out to 230 nurses. 203 questionnaires were filled in fully. The participating wards were geriatrics, rehabilitation, pediatrics, surgical, internal medicine, and ICU. The questionnaires were digital and were handed out and collected over several months. The wards are varied, and the participants were of all ages, seniority, roles, qualifications, and ethnical origins.

The Sheba Medical Center at Tel Hashomer is a university-affiliated tertiary referral hospital that serves as Israel's national medical center in many fields.

Adjacent to Tel Aviv, it is the most comprehensive medical center in the Middle East, renowned for its compassionate care and leading-edge medicine. It is also a major medical-scientific research powerhouse that collaborates internationally with the biotech and pharmaceutical industries to develop new drugs, treatments and technologies, and a foremost global center for medical education.

WDHB/ Ursula/Clinical%20Nurse%20Specialist%20Nutrition%20Support%20Team%20June%202017%20.pdf

¹⁴ A. Raiesifar et al., *Journal of Medical Ethics and History of Medicine*, Journal of Medical Ethics & History of Medicine, 2016, 9(13).

¹⁵ *Israel Health Authority Report*, 2017.

The Sheba Academic School of Nursing was established in April 1949, as a nursing school for the Israeli Defense Forces. The first director of the nursing school was Mrs. Miriam Zaggi, and the school matriculated women soldiers who were to be trained as nurses. In 1963 the school became a civilian institution. Since 1974 the school has been associated with university-level preparation and in 1989 a four-year baccalaureate program was established at Tel Aviv University. Today's baccalaureate students graduate with a B.A. in nursing and are eligible to take the governmental exam for registered nurses.

Measures and instruments – the original questionnaire

In the absence of a suitable existing validated Hebrew questionnaire, one was developed by the researchers from R.M.C. To construct the tool and for validation thereof, a multidisciplinary focus group was set up, consisting of three senior nurses, two dieticians and one physician, all experts in nutritional care. The group was asked to define the component domains of the nursing aspects of nutritional care and of nurses' commitment to, and perception of, the quality of nutritional care. All members of the focus group reviewed the questionnaire for face validity, feasibility and comprehensibility and had to be in full agreement for any item to be included. At the end of the process the final version of the tool was piloted among ten senior nurses who comprised the validation set. For each section, the alpha Cronbach internal consistency was evaluated.

The questionnaire comprised three sections with all items answered on a Likert scale. The three sections were: (a) nurses' evaluation of the importance of a nutrition assessment, (b) nurses' knowledge of nutrition care and (c) nurses' evaluation of the quality of nutrition care in their department. The questions were based on an analysis of the process of feeding patients in the hospital, from the preparation of the food until the stage where the patient imbibes the food. The process was based on the guidelines for preventing malnutrition in the hospital. A fourth section collected demographic data on the respondents.

Demographic data are shown in Table 3. The majority (76%) of the 202 nurses who returned a completed questionnaire were female; their mean age was 34 (± 15) and mean seniority 11 years (± 10). Most (29%) worked in internal medicine or geriatric wards, 26% in pediatrics, 23% rehabilitation, 17% in surgery, and 5% in intensive care. The majority (71%) were regular line nurses, and 29% were nurse managers. Regarding education, 15% had a nursing diploma, 62% a B.A. or B.Sc in nursing and 23% an M.A. or M.Sc in nursing. More than half (53%) had advanced nurse training while 24% had received specific training in nutritional care in the five years prior to the study.

Table 3

Nurses' demographic characteristics

		N	%
Department	Geriatric-inner ward	58	28.7%
	Rehabilitation	46	22.8%
	Kids	53	26.2%
	Intensive care	10	5.0%
	Surgery	35	17.3%
Gender	Female	154	76.2%
	Male	48	23.8%
Age	$M=33.9$ [25-70], $SD=15.4$		
Care-taking tenure	$M=10.6$ [0-43], $SD=10.3$		
Birthplace	Israel	136	67.3%
	Other	66	32.7%
Position	Regular nurse	144	71.3%
	Senior nurse	58	28.7%
Education	certified nurse	31	15.3%
	Ba	125	61.9%
	Ma	46	22.8%
Advanced nurse training (% from all participants)		107	53.0%
Trained in nutrition care during the five years prior to the present study (% from all participants)		48	23.8%
Total		202	100.0%

Data Analysis

Data was analyzed by SPSS software version 17 (SPSS Inc., Chicago, IL, USA). For categorical and continuous variables frequencies and means were calculated. Pearson correlations were performed to examine the correlation between nutritional assessment and knowledge and perceived quality of care. Inferential statistics (independent t-test and one-way ANOVA) were applied to test whether the distribution of research measurements is not different across different background categories. Stepwise multiple linear regression was performed to identify predictors of the three factors tested for by the questionnaire.

Results

Research tools (variables)

The subject of the research is nurses' nutritional care importance assessment, knowledge, and quality perception. As presented in Table , all variables are reliable with Cronbach's alpha internal reliability score higher than 0.7 for the importance of nutritional assessment was 0.82, 0.81 for knowledge of nutrition care and 0.94 for the perceived quality of nutritional care. Questionnaire items are presented in the appendix.

The mean score for the importance of nutritional assessment was 3.33 (SD ± 0.50), for knowledge of nutrition care 3.01 (SD ± 0.51) and for the perceived quality of nutrition care 3.76 (SD ± 0.87). The correlation between the importance of nutrition assessment and nutritional knowledge was $r = 0.20$ ($P < 0.01$). The correlation between the importance of nutrition and the perceived quality of nutrition care was $r = 0.17$ ($P < 0.05$). No significant correlation was documented between the perceived quality of nutrition care and knowledge of nutrition among the nurses (Table 4).

Table 4

Nutrition care importance assessment, knowledge, and quality perception
- Descriptive statistics, Cronbach's α , and Correlations

	Descriptive statistics		Correlations (Cronbach's α presented in parentheses)		
	M	SD	Importance of nutritional assessment	Knowledge of nutrition care	quality of nutritional treatment
Importance of nutritional assessment	3.33	.50	(.818)		

Knowledge of nutrition care	3.01	.51		.195**	(.813)	
quality of nutritional treatment	3.76	.87		.165*	-0.022	(.936)

**p<.01, *p<.05.

Hypotheses testing

Table 5 summarizes the results of ANOVA analyses examination of nurses' nutrition care importance assessment, knowledge, and quality perception by department in which they serve. As indicated, no significant differences were documented suggesting that nurses' nutrition care importance assessment, knowledge, and quality perception are affected by specialized medical practices, as reflected by different departments and the populations they treat.

Table 5
Nutrition care importance assessment, knowledge, and quality perception by department (ANOVA Analysis)

	Department					F
	Geriatric-inner ward	Rehabilitation	Children	Intensive Care	Surgery	
	A	B	C	D	E	
N	58	46	53	10	35	
Importance of nutritional assessment	3.19	3.37	3.44	3.41	3.30	2.115
Knowledge of nutrition care	2.96	3.02	3.08	2.90	2.98	.554
Quality of nutritional treatment	3.74	3.89	3.61	3.99	3.77	.839

**p < .01, *p < .05.

The table below shows that female nurses' knowledge (M = 3.05) is significantly (t(df = 198), p < .05) higher than male (M = 2.86). While no significant gender differences regarding Importance Assessment and Perceived Nutritional Treatment Quality, these findings suggest gender knowledge differences.

Table 6

Nutrition care importance assessment, knowledge, and quality perception
by Gender (T-test Analysis)

	Gender		t
	female	male	
N	154	48	
Importance of nutritional assessment	3.34	3.27	.889
Knowledge of nutrition care	3.05	2.86	2.231*
quality of nutritional treatment	3.72	3.88	1.052

*p < .01, *p < .05.

The table below shows the results of t-test analyses conducted to test for differences in nurses’ nutritional care importance assessment, knowledge, and quality perception by their birthplace. Conversely to Theilla et al (2016) and as indicated, no significant differences were documented, suggesting that nurses’ socio-cultural background is not a significant factor in their nutrition care importance assessment, knowledge, and quality perception.

Table 7

Nutrition care importance assessment, knowledge, and quality perception
by Birthplace (T-test Analysis)

	Birthplace (Origin)		t
	Israel	Other	
N	136	66	
Importance of nutritional assessment	3.32	3.35	.384
Knowledge of nutrition care	3.01	3.00	.174
quality of nutritional treatment	3.76	3.76	.028

*p < .01, *p < .05.

Table 8 below shows that Regular nurses' Knowledge ($M = 2.95$) is significantly ($t_{(df = 198)} = 2.266$, $p < .05$) lower than Senior nurses ($M = 3.13$). No significant position showed differences regarding Importance Assessment and Perceived Nutritional Treatment Quality.

Table 8

Nutrition care importance assessment, knowledge, and quality perception
by Position (T-test Analysis)

	Position		t
	regular nurse	senior nurse	
N	144	58	
Importance of nutritional assessment	3.29	3.41	1.501
Knowledge of nutrition care	2.95	3.13	2.266*
quality of nutritional treatment	3.81	3.65	1.153

** $p < .01$, * $p < .05$.

Using ANOVA analyses to test for differences of nurses' nutrition care importance assessment, knowledge, and quality perception by their education level (Table 9 below), we found that there are no significant differences. Converse to Theilla et al (2016), these findings suggest that nurses' attitudes are not affected by their education level.

Table 9

Nutrition care importance assessment, knowledge, and quality perception
by nurses' education (ANOVA Analysis)

	Nurses' education level			F
	certified nurse	BA	MA	
N	31	125	46	
Importance of nutritional assessment	3.34	3.30	3.38	.368
Knowledge of nutrition care	2.90	2.99	3.11	1.704
quality of nutritional treatment	3.47	3.80	3.83	2.010

** $p < .01$, * $p < .05$.

Table 10 presents nurses’ nutrition care importance assessment, knowledge, and quality perception correlations with their age, tenure, and position scope. As indicated, except for a positive association of nurses’ knowledge of nutrition care with age ($r = .164, p < .05$), no other significant association was found, especially regarding tenure.

Table 10
Nutrition care importance assessment, knowledge, and quality perception by nurses’ age, tenure and position scope (Correlations)

	Age	Care-taking tenure	Position scope (%)
Importance of nutritional assessment	0.008	0.119	0.020
Knowledge of nutrition care	.164*	0.100	0.041
Quality of nutritional treatment	-0.114	0.015	0.081

* $p < .01$, * $p < .05$

Overall, except for knowledge these findings suggest that nurses’ attitudes are affected by age, tenure, or position scope.

Nurses’ training

Using a t-test to examine how participation in advanced training is associated with nurses’ nutrition care importance assessment, knowledge, and quality perception (Table 11) did not produce any significant findings, implying that advanced training does not affect nurses’ attitudes in this regard.

Table 11
Nutrition care importance assessment, knowledge, and quality perception by Participation in advanced training (T-test Analysis)

	Participation in advanced training		t
	No	Yes	
N	95	107	
Importance of nutritional assessment	3.29	3.35	.844
Knowledge of nutrition care	2.96	3.05	1.187
quality of nutritional treatment	3.80	3.73	.566

* $p < .01$, * $p < .05$.

However, as summarized in Table 12 below, nurses who participated in an advance training focusing on Emergency Care presented significantly higher ($t(df = 198) = 3.506, p < .01$) Knowledge levels ($M = 3.21$) compared with nurses who did not participate in such a course ($M = 2.93$). No other differences were observed regarding nurses' nutrition care importance assessment, and quality perception. It is interesting to indicate that Theilla et al (2016) documented higher levels by intensive care nurses (i.e. department), while the present study does not indicate any difference regarding the department, while nurses' in-service training is found to play a significant role in their attitudes.

Table 12

Nutrition care importance assessment, knowledge,
and quality perception by participated in advance training: Emergency Care
(T-test Analysis)

	Participated in advance training: Emergency Care		t
	No	Yes	
N	148	54	
Importance of nutritional assessment	3.29	3.41	1.541
Knowledge of nutrition care	2.93	3.21	3.506**
quality of nutritional treatment	3.81	3.63	1.343

** $p < .01$, * $p < .05$.

Table 13 below shows nurses' nutrition care importance assessment, knowledge, and quality perception levels by training in nutritional care during the five years prior to the present study. As indicated, training in nutritional care during the five years prior to the present study is associated with lower Importance assessment (3.19 vs. 3.37, $t(198) = 2.132, p < .05$), and lower perceived nutritional treatment quality (3.42 vs. 3.86, $t(198) = 3.039, p < .01$). This training does not affect nurses' knowledge.

Through this, the importance of investing in the quality of nurses' education and the influence on their knowledge, are highlighted.

Table 13

Nutrition care importance assessment, knowledge, and quality perception
by training in nutrition care during the five years prior to the present study
(T-test Analysis)

	Trained in nutrition care during the five years prior to the present study		t
	No	Yes	
N	154	48	
Importance of nutritional assessment	3.37	3.19	2.132*
Knowledge of nutrition care	3.02	2.97	.475
Quality of nutritional treatment	3.86	3.42	3.039**

**p < .01, *p < .05.

These findings are somewhat alarming, since they imply such training influences nurses’ attitudes toward nutrition. From this we see the importance of preparing nurses and training them, and the understanding of the importance of quality of guidance and training.

Regression analysis

Nurses’ attitudes regarding nutritional care were also analyzed using MANCOVE (Multivariate Analysis of Covariance) analysis (Table 14). The model for Importance of nutritional assessment as dependent variable was not significant. However, the model for Knowledge of nutrition care as dependent was significant ($F(15,177) = 1.990, p < .05$), with age ($b = .006, p < .05$) and higher-level of training: Emergency Care ($b = .427, p < .01$) the only (positive) significant association. The model for Perceived nutrition care quality as dependent was also found to be significant ($F(15,177) = 2.002, p < .05$), with higher-level of training: Emergency Care ($b = -0.378, p < .05$) and trained in nutrition care during the five years prior to the present study ($b = -0.494, p < .05$) the only (negative) significant association.

Table 14
MANCOVA analysis of Nutrition care importance assessment, knowledge,
and quality perception by background and professional characteristics

	Dependent Variable					
	Importance of nutritional assessment		Knowledge of nutrition care		Quality of nutritional treatment	
	B	T	B	t	B	t
Intercept	3.077	9.173	2.730	7.602	3.414	5.664
Gender	-0.066	-0.742	-0.142	-1.486	0.053	0.334
Birthplace	0.055	0.639	-0.010	-0.105	0.196	1.262
Position	0.128	1.219	0.111	0.984	-0.177	-0.939
higher-level of training	-0.120	-1.198	-0.178	-1.661	0.029	0.162
higher-level of training: Emergency Care	0.064	0.637	0.427	3.956**	-0.378	-2.085*
trained in nutrition care during the five years prior to the present study	-0.148	-1.691	-0.049	-0.523	-0.494	-3.135**
Age	-0.002	-0.603	0.006	2.075*	-0.009	-1.791
Tenure	0.004	0.746	-0.003	-0.556	0.006	0.721
Position scope (%)	0.003	0.781	0.000	-0.005	0.010	1.639
Geriatric-inner ward	-0.073	-0.655	0.026	0.222	0.021	0.105
Rehabilitation	0.096	0.806	0.044	0.347	0.082	0.383
Pediatrics	0.123	1.097	0.061	0.507	-0.121	-0.599
Intensive care	0.087	0.436	-0.081	-0.381	0.052	0.146
Certified nurse	0.138	1.032	0.062	0.433	-0.417	-1.739
Ba	0.035	0.348	0.043	0.400	-0.147	-0.806
	F _(15,177) = .493		F _(15,177) = 1.990*		F _(15,177) = 2.002*	
	R ² = .082		R ² = .156		R ² = .156	

**p < .01, *p < .05.

These findings suggest that Importance assessment is not affected by nurses’ background characteristics and their training. They also imply that Emergency care higher-level training improve knowledge but harm perceived quality, and that Nutrition focused higher-level training does not improve knowledge but harm perceived quality.

Following Theilla et al (2016), another MANCOVA analysis was conducted (Table 15) testing how importance and Knowledge regarding nutritional care are associated with perceived nutrition care quality. The analysis indicated a significant model ($F_{(17,177)} = 1.889$ $p < .05$) with negative association of Emergency Care higher-level training ($b = -0.376$, $p < .05$) and of nutrition focused training during the five years prior to the present study ($b = -0.465$, $p < .01$).

Table 15

MANCOVA analysis of quality perception by background and professional characteristics and Nutrition care importance assessment, knowledge

	Quality of nutritional treatment	
	B	t
Intercept	2.882	3.604
Gender	0.062	0.384
Birthplace	0.184	1.185
Position	-0.199	-1.050
higher-level of training	0.047	0.260
higher-level of training: Emergency Care	-0.376	-1.979*
trained in nutrition care during the five years prior to the present study	-0.465	-2.927**
Age	-0.009	-1.651
Tenure	0.006	0.622
Position scope (%)	0.009	1.547
Geriatic-inner ward	0.037	0.185
Rehabilitation	0.064	0.298
Pediatrics	-0.144	-0.710
Intensive care	0.031	0.088

Certified nurse	-0.443	-1.842
Ba	-0.152	-0.837
importance	0.206	1.439
Knowledge	-0.037	-0.275
		$F_{(17,177)}=1.889^*$
		$R^2=.167$

* $p < .01$, * $p < .05$.

These findings suggest that on-service nurses' training (i.e. Emergency care higher-level training and nutrition focused training during the five years prior to the present study) hampers nurses' perceived quality. These findings also suggest that nurses' training mediate all other associations with nurses' perceived quality. Specifically, nurses' on-service training was found to mediate importance assessment and knowledge association with perceived quality.

Discussion

Nutritional care within hospitals requires cooperation with staff – doctors, nurses, dietitians, and pharmacists – to ensure results for patients.

Cooperation between the different staff members, and understanding which knowledge each has, along with learning from one another, is an important step to promoting healthcare.

For this research nurses were questioned with regards to their knowledge and perceptions regarding nutrition. The questionnaires were anonymous, the description is a quantitative analysis of the research field, the theory is mathematical and formal, formula was used to measure and quantify the results. The relationship between variants, using phrases such as “to what extent” and “what is the relation between”. The sample was as large, random, and representative as possible. The goal was to isolate the variants and create a research environment whereby the researcher is also isolated from direct involvement in the research and remain objective.

The results show no differences between the nurses who participated, their background profiles were the same. It seems that the training provided in nursing school creates a similar profile amongst all nurses.

Nurses who participated in advanced training throughout their work on the wards, or advanced courses such as ICU or emergency training, show

a level of confusion in their approach – they avoid the topic in their daily work. It is clear that on all wards the nursing care has a central role in nutritional assessments and care.

The question that remains is whether the nurses behave in such a way due to ward policies, or is impacted by the head nurse or other members of the care team, and whether priority is given to other responsibilities which are perceived as more important to the patient.

A study by Kochava (2012) showed similar conclusions, namely that the level of nurses' knowledge regarding nutrition for elderly hospitalized patients is lower than that required to fulfil their role optimally, and the nurses are aware of this. The nurses in the study perceived the role of feeding and washing patients as less important than their other roles and perceive themselves as fulfilling an instructional role, performing assessments and decision making. It is believed that educating the nurses is the key to improving patient care.

Another survey that checked Nurses' Knowledge and attitude regarding nutrition assessment and care of hospitalized elderly patients¹⁶ measured the correlation between knowledge and feeding at the hospital. 106 nurses participated, from two large governmental hospitals. They found that nutritional care tasks such as feeding patients, performing nutritional assessments, and providing appropriate food for patients, were regarded as relatively unimportant. A significant positive correlation was identified between nutritional knowledge and the importance placed on the role of nutrition in health and disease.

Implications for further research and practice

The need for a nutritional educational model through additional sources has been recognised, as this will allow us to overcome the gap related to gender, ethnical origin, age and previous training or qualifications.

It seems that nurses who received additional training were confused by it, and instead of empowering them it caused them to "avoid" dealing with the nutritional aspects on their ward. Therefore, it is important to examine the quality of guidance provided.

The "Team Model" is an educational model which can be applied to nutrition, through gathering a nurse from each ward, and each of these nurses who learns the topic will be part of our "team" which advances the subject, each on their ward.

¹⁶ M. Boaz, L. Rychani, K. Barami, Z. Hourri, R. Yosef, A. Siag, ... E. Leibovitz, *Nurses and nutrition: A survey of knowledge and attitudes regarding nutrition assessment and care of hospitalized elderly patients*, The Journal of Continuing Education in Nursing, 2013.

This will be combined with the “Coach” model, whereby the nurse “coaches” the other nurses on the ward after being provided with the learning materials in an organised, academic, and feasible manner.

The aspects being learnt must also be relevant to the nurse, as the knowledge should connect to emotion, and hence the topic of nutrition will undergo a significant change.

This method will allow us to influence attitudes and knowledge and therefore quality of nutritional care and feeding provided by the nurse.

Appendix – research tools

The knowledge which is provided to nurses must be in line with the quality of guidance which is reviewed on the topic of nutrition, and this will improve quality and continuity of care and nurses’ satisfaction with their role.

Item	M	SD
Section 1: Nurses’ evaluation of the importance of nutritional assessment (1 to 4 scale)		
1. An initial nutritional assessment is important in patient care	3.67	0.60
2. Monitoring a patient’s nutritional status is a basic component of nursing care	3.46	0.67
3. The nurse is responsible for notifying the attending physician if a patient does not eat a served meal	3.63	0.66
4. It is important to weigh patients upon admission	3.51	0.68
5. It is important to repeat the nutritional assessment every week of hospitalization	3.31	0.71
6. Nutritional assessment and monitoring by the nurses improve a patient’s recovery	3.32	0.70
7. Nursing care has a significant impact on patients’ nutritional status	3.08	0.78

*Likert scale: 1. Strongly disagree, 2. Disagree, 3. Agree, 4. Strongly agree M- mean, SD- standard deviation.

Item	M	SD
Section 2: Nurses’ knowledge about nutrition care (1 to 4 scale)		
1. Nurses should focus on the patient’s primary diagnosis rather than on nutritional aspects	2.28	0.91
2. A patient who refuses to eat should not be forced to do so	1.80	0.85

3. The main reason patients don't eat hospital food is its appearance and taste	2.23	0.89
4. Nutritional support should commence only once medical treatment has been completed	1.74	0.80
5. Nutritional support is resource-consuming and not a cost-effective investment	1.63	0.79
6. Dieticians, rather than the nursing staff, are responsible for nutritional support	1.76	0.83
7. Parenteral nutrition should be avoided due to its complications	2.99	0.86
8. Obese patients (BMI > 30) are not at risk of malnutrition and should be fed sparingly	3.34	0.77
9. A patient eating a meal should not be disturbed, even for medical treatment	2.56	0.89
10. Overweight patients with cancer will inevitably lose weight and need not be referred to a dietician	3.55	0.71

Likert scale: 1. Strongly disagree, 2. Disagree, 3. Agree, 4. Strongly agree M- mean, SD- standard deviation.

Item	M	SD
Section 3: Nurses' evaluation of the quality of nutritional care in nurses' ward (1 to 5 scale)		
1. Patients receive complete nutritional care	4.07	0.80
2. Our nursing staff monitors patients' nutritional status	3.77	0.86
3. The nutritional assessment is performed methodically and professionally	3.74	0.95
4. Patients requiring a dietician's care receive a consultation with minimal delay	4.26	0.76
5. Physicians address nutritional aspects of patient care	3.62	1.05
6. Patients receive their meals in an appropriate manner as per regulations	3.98	0.91
7. Nurses are aware whether or not a patient has completed his meal	3.78	0.89
8. information on patients' nutritional state is effectively transmitted among health care staff	3.84	0.95
9. I am satisfied with the level of nutritional care in my ward	3.81	0.95

Likert scale: 1. Strongly disagree, 2. Disagree, 3. Agree, 4. Strongly agree M- mean, SD- standard deviation

Section 1 (7 items) was designed to investigate whether nurses considered nutritional assessment to be of clinical importance and a fundamental component of nursing care, both upon admission and during the hospital stay. The mean score across all items was taken as overall score for this section, as for the remaining two sections.

Section 2 (10 items) tested nurse's knowledge of nutrition care by asking them to agree or disagree with ten correct and incorrect statements. To maintain consistency in the directionality of scores, the negative items were recorded and scored in reverse fashion. A higher mean score across all 10 items reflected a wider knowledge of nutrition care.

Section 3 (9 items) asked respondents to rate the quality of nutritional care provided in their department. A higher mean score across all 9 items reflected a more positive evaluation of the quality of nutrition care.

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