Applied nutritional investigation

Improving oncology nurses' knowledge, self-confidence, and self-efficacy in nutritional assessment and counseling for patients with cancer: A quasi-experimental design

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ABSTRACT

Objective: Our objective was to assess the effectiveness of a structured educational program on improving oncology nurses' knowledge, self-confidence, and self-efficacy in nutritional assessment and counseling for patients with cancer.
Methods: A pretest−posttest quasi-experimental design was used. A sample of 60 nurses from oncology units participated as an experimental group ($n = 30$) and a control group ($n = 30$). The participants completed a knowledge test before completing the educational program. Self-confidence and self-efficacy also were assessed pre- and postintervention.
Results: There was a significant difference between the experimental (mean [M] = 26.00, SD = 8.00) and control (M = 10.00, SD = 3.75) groups regarding knowledge after the interventional sessions ($t = -16.00$, $P = 0.001$). Furthermore, the results indicated a significant difference ($t = -24.00$, $P = 0.001$) between the experimental group (M = 60.50, SD = 13.10) and the control group (M = 36.50, SD = 7.60) regarding self-confidence in managing cancer patients. Finally, there was a significant difference between the experimental group (M = 33.50, SD = 3.10) and control group (M = 23.25, SD = 2.75) regarding self-efficacy ($t = -10.25$, $P = 0.001$).
Conclusions: The educational program improved the oncology nurses' knowledge, self-confidence, and self-efficacy in relation to nutritional assessment and counseling. Improving nurses' competencies will improve the quality of care provided to the patients and patient health outcomes.

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Introduction

Cancer diagnosis and treatment modalities have a severe impact on patient nutritional status. They affect the metabolic process and cause loss of appetite. In addition, using different cancer treatment modalities, such as chemotherapy, surgery, and radiotherapy, causes a number of side effects, including anorexia, diarrhea, oral infection, vomiting, change in taste buds, and nausea, which affect eating habits and lead to poor nutritional status [1,2]. Malnutrition and weight loss are common among cancer patients as a result of treatment options, particularly chemotherapy. Long periods of treatment cause nutrient loss, energy alteration, and decreased food intake [3,4].

Importantly, there is an increased interest among heath researchers to examine the impact of nutrition on patients' health status and disease prognosis. Different research studies, such as clinical trials, systematic reviews, and observational studies, have been conducted to evaluate patients' nutritional status and the impact of nutrition on hospitalized patients with chronic illness. The results indicate that improving nutritional support leads to decreased morbidity and mortality, decreased length of hospital stay, and reduced cost of treatment [5−7].

Malnutrition is a serious and common problem among patients with cancer. It negatively affects their prognosis and reduces their quality of life. Statistics indicate that 15% to 40% of cancer patients experience weight loss during treatment. This percentage can increase up to 85% in patients with an advanced stage of cancer [8]. Accordingly, early intervention and patient education about nutritional supplements and habits can improve patients' outcome and prevent such complications.

Multidisciplinary team collaboration is required for providing optimal nutrition care for patients with cancer. A qualified registered dietitian is an essential member of the heath team, but all

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physicians and nurses must be active participants in identifying patients at risk for malnutrition and follow-up the interventions. Bedside oncology nurse can perform initial screening, educate the patients, and develop a trust relationship to increase patients' compliance to the care plan. Dietitians perform complete and intensive assessment to develop the evidence-based interventions when required. The attending physician supervises the care plan and discus it with the team. This harmony of collaboration between multidisciplinary members allows for the provision of holistic care and helps identify patients with nutrition problems [9,10].

Holistic care may include pharmacist, social workers, and physiotherapists. The ultimate goal of this collaboration is to identify patients with malnutrition and nutrition difficulties such as drug interaction, financial problems, and physical limitation. All health professionals must be knowledgeable according to their role. Nutrition care includes baseline screening, encouraging patients with cancer to eat, education about nutrition supplements, and tube feeding when needed. Different members participate in the treatment plan depending on the intention. The bedside oncology nurse is perfectly positioned and trained to perform the initial assessment and guidance [9,10].

Cancer remains a leading cause of death worldwide; it is the second highest cause of mortality after cardiovascular disorders and one of the most common disorders among adults [11]. Accordingly, as the number of cancer patients increases, the need for qualified professionals, particularly nurses, increases as well. In general, nursing schools are preparing students to be general nurses with no specialized training in nutritional assessment and counseling for cancer patients.

Nurses play key roles in treatment plans for patients with cancer. Their ability to provide patients with nutritional support and advice depends on their knowledge about nutritional assessment and demands during this journey. Alarmingly, 43% of oncology nurses perceived themselves as having insufficient knowledge to provide advice on nutrition [12].

Increasing demand for nurses trained in proper nutrition practices in clinical settings has forced researchers to conduct experimental studies to assess the effectiveness of conducting educational programs on improving nurses' knowledge, self-confidence, and self-efficacy. In addition, limited literature exists on the nutritional education of oncology nurses. Thus this study was conducted to assess the effectiveness of a nutritional education program on oncology nurses' knowledge, self-confidence, and self-efficacy.

Materials and methods

Design, sampling, participants, and measures

A pretest and posttest quasi-experimental design was used to assess the effectiveness of an educational program on oncology nurses' knowledge, self-confidence, and self-efficacy regarding nutritional assessment and caring for cancer patients. Ethical approval was obtained. Data were collected between April and June 2018. A power analysis for a *t* test was calculated to determine the estimated sample size [13]. A sample of 60 participants (30 participants per group) was estimated with an effect size of 0.5 ($\alpha = 0.05$, $P = 0.80$).

An invitation poster was distributed in the oncology units to provide potential participants with an overview of the study purpose and methodology. Once potential participants agreed to participate, the researcher coded their names in the nurses' list. Then 60 participants were selected randomly from the list of all nurses working in the oncology units, including surgical, medical, bone marrow transplantation, pediatric, and adult outpatient clinics. Thirty participated in the study as a control group and 30 as an intervention group.

Demographic sheet

Structured questions related to the nurses' gender, age, and experience were collected.

Knowledge test

The knowledge-based test consisted of 20 multiple choice questions developed by the researcher to test the nurses' knowledge pre- and postintervention. Each question had a stem with four possible answers; only one was considered correct and randomly positioned. The test included different levels of questions based on Bloom's taxonomy, including comprehension, understanding, and analysis.

The test was developed using the *Nutrition and Cancer* textbook [14] and previous literature [15–18]. Questions related to nutritional assessment methods, impact of cancer treatment on nutritional status, complications of treatment, energy and protein diet, oral supplements, and preventive measures for anorexia were included.

The total score of the test was 40 points (each question was weighted by a score of 2), and the critical score was 20 points (50% of the total score). The participants took 40 to 60 minutes to complete the test. External experts in academic and clinical fields evaluated the test for face and content validity before implementation. The researcher, in consultation with panel of experts (three professionals, one with a Ph.D. in nursing, one with a Ph.D. in clinical nutrition, and one dietitian), checked the content validity and measured the reliability.

Self-confidence scale

The self-confidence of each nurse was assessed using a self-confidence scale developed by Hicks [19]. The scale consists of 13 items and was rated using a 5-point Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree). The scale was valid and reliable per Cronbach's α (0.96) [19].

Self-efficacy scale

A 10-item scale developed by Schwarzer and Jerusalem [20] was used to measure the nurses' self-efficacy. The scale was reliable and valid with a Cronbach's α of 0.80.

Pilot testing

A pilot study was conducted to evaluate the reliability and applicability of the instruments and knowledge test and to determine if there were any difficulties in the administration. Ten participants completed the study instruments. Preliminary results indicated that the knowledge test was reliable (Cronbach's $\alpha = 0.87$), as were the self-confidence scale (Cronbach's $\alpha = 0.83$) and self-efficacy scale (Cronbach's $\alpha = 0.88$). A panel of experts reviewed these results and approved the instruments.

Educational program

The experimental group attended the educational program, which consisted of 10 theoretical hours and 10 clinical training hours. The content covered nutritional assessment methods, impact of cancer treatment on nutritional status, complications of treatment, energy and protein diet, oral supplements, and preventive measures for anorexia. The researchers used different teaching aids, including role play, lectures, handouts, videos, and open discussion. The research team implemented the program over a 2-wk period.

Data analysis

SPSS version 23 (IBM Corp., Armonk, NY, USA) was used to run the data analysis. Descriptive analysis was used to describe the sample characteristics of the nurses and the scale's items. A paired *t* test was run to examine if there was significant difference between the mean pretest and posttest scores in knowledge, self-confidence, and self-efficacy.

Results

Sample characteristics

Sixty oncology nurses participated in the study (26 female and 34 male). The mean age was 26.1 y for the experimental group (SD = 2.75) and 25.8 y (SD = 1.75) for the control group. The mean of experience was 2.9 y (SD = 0.79) for the experimental group and 3.2 y (SD = 0.81) for the control group. An independent *t* test was conducted to assess the homogeneity of the participants from both groups. The results indicated no significant differences in terms of age, gender, years of experience, pretest knowledge, pretest self-confidence, and pretest self-efficacy among the participants (Table 1).

Discussion

Nutritional assessment and counseling are important elements in cancer care. They are defined as the advice and education given to change patients' eating habits and behaviors. It is highly important

Table 1
Participants' characteristics and pretest for experimental and control group ($n = 60$)

Variable	Mean and SD (pretest): Experimental group ($n = 30$)	Mean and SD (pretest): Control group ($n = 30$)	P
Age (years)	26.1 (SD = 2.75)	25.8 (SD = 1.75)	0.73
Sex			
Male	16	18	0.38
Female	14	12	
Experience (years)	2.9 (SD = 0.79)	3.2 (SD = 0.81)	0.58
Knowledge	8.00 (SD = 1.65)	6.00 (SD = 1.65)	0.58
Self-confident	25.5 (SD = 3.95)	22.5 (SD = 2.80)	0.29
Self-efficacy	22.5 (2.11)	21.5 (2.31)	0.75

Research outcomes indicate there was a significant difference between the experimental and control groups regarding knowledge related to nutritional assessment and caring for patients with cancer ($t = -16.00$, $P = 0.001$). Mean and SD were 26.00 (8.00) for the experimental group and 10.00 (3.75) for the control group. Furthermore, the results indicated a significant difference ($t = -24.00$, $P = 0.001$) between the experimental group (M [mean] = 60.50, SD = 13.10) and the control group (M = 36.50, SD = 7.60) regarding self-confidence. Finally, the self-efficacy score improved after the attending the educational program. Table 2 details these results.

Table 2
Mean posttest difference in knowledge, self-confident, and self-efficacy ($n = 60$) in experimental and control groups

Variable	Mean and SD (posttest): Experimental group ($n = 30$)	Mean and SD (posttest): Control group ($n = 30$)	T	P
Knowledge	26.00 (8.00)	10.00 (3.75)	−16.00	0.001
Self-confident	60.50 (13.10)	36.50 (7.60)	−24.00	0.001
Self-efficacy	33.50 (3.10)	23.25 (2.75)	−10.25	0.001

to encourage optimal care and minimize nutritional complications and consequences on the treatment plan and patient outcomes [21].

Supportive nutritional care, including education and advice provided by nurses, is considered a pivotal factor in preventing or reducing the nutritional risk among patients with cancer. In addition, involving patients' families and care providers in the education increases their awareness and has a positive impact on patients' nutritional status [21]. Accordingly, nurses must be knowledgeable and have the required competencies to provide this particular type of care.

Previous studies found that training nurses to perform nutritional assessment and offer nutritional advice has a positive impact on patient behaviors and health outcomes [21,22]. It can affect health status in cancer patients [23], significantly improve physical function, and minimize the depression rate [24].

Although the provision of nutritional assessment, support, and counseling to patients with cancer has obvious benefits, there is evidence of a gap in the preparing and training of nurses in general and oncology nurses specifically to play this important role and offer nutritional support when needed. Nurses' lack of knowledge, self-confidence, and self-efficacy are considered major obstacles and barriers to offering nutritional assessment and counseling for cancer patients. It has been noted that nutritional assessment and support is only a small part in the undergraduate nursing curricula and education [25]. The results of this study indicated that oncology nurses who participated in the program had significant improvement in their knowledge, self-confidence, and self-efficacy compared with nurses from the control group.

To my knowledge, limited research has been conducted to assess the impact of an educational program on nurses' knowledge, self-confidence, and self-efficacy, particularly regarding cancer patients. Therefore I cannot make direct comparisons of these results with other studies.

The results of this study indicated that nurses lacked knowledge regarding nutritional assessment and advice before the intervention in both the experimental group (mean [M] = 8.00, SD = 1.65) and the control group (M = 6.00, SD = 1.65). These results supported the assumption that nurses require continuing education in nutritional assessment. A study by Jyothi Prince [26] reported similar results, finding that a large percentage of oncology nurses lacked knowledge about nutrition among cancer patients. The recommendation from that study was to educate and train the nurses to achieve the optimal care for cancer patients [26].

In the present study a significant improvement in nurses' knowledge was achieved after the intervention. There was a significant difference between the experimental group (M = 26.00, SD = 8.00) and the control group (M = 10.00, SD = 3.75) regarding knowledge after the interventional sessions ($t = -16.00$, $P = 0.001$). These results support previous results obtained by Bjerrum et al. [27], which indicated that training programs increase nurses' knowledge about nutrition.

Moreover, the results of the present study indicated increases in nurses' self-confidence after the intervention. Continuing education and training increase nurses' skills, encourage safe practice, and provide nurses with constructive feedback, leading to an increase in self-confidence [28–30]. In this study the oncology nurses felt more confident to take on responsibilities in nutritional assessment and counseling for cancer patients. Readiness to assess, care, and advise cancer patients about their nutrition depends on the nurses' knowledge and self-confidence [11].

Oncology nurses' self-efficacy was defined as the ability to complete the tasks successfully and competently. The nurses felt competent in assessing and talking to the patients about their nutritional status. This study found that their self-efficacy improved after the intervention. These findings support a study conducted in Japan that revealed that self-efficacy was improved after intervention in relation to medical ethics and interpersonal skills, nutrition assessment, and developing a nutritional management plan [31].

Conclusions

The educational program improved oncology nurses' knowledge, self-confidence, and self-efficacy in relation to nutritional assessment and counseling. Improving nurses' competencies will improve the quality of care provided to patients and patient health outcomes. The results of this study highlight the importance of continuing education for nurses to enable them to accomplish their roles. The sample size of the participants was considered a major limitation to generalizing the results, but the findings highlight the importance of investigating this topic with a large sample size. Further research is recommended to address the impact of nutritional counseling on patients' prognosis and response to treatment.

Acknowledgments

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