DOI: 10.12923/pielxxiw-2025-0036

Nursing in nutritional support in cancer patients – case study

Pielęgniarstwo w zakresie wsparcia żywieniowego pacjentów chorych na nowotwory – studium przypadku

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A – Development of the concept and methodology of the study/Opracowanie koncepcji i metodologii badań; B – Query - a review and analysis of the literature/Kwerenda – przegląd i analiza literatury przedmiotu; C – Submission of the application to the appropriate Bioethics Committee/Złożenie wniosku do właściwej Komisji Biotycznej; D – Collection of research material/Gromadzenie materiału badawczego; E – Analysis of the research material/Analiza materiału badawczego; F – Preparation of draft version of manuscript/Przygotowanie roboczej wersji artykułu; G – Critical analysis of manuscript draft version/Analiza krytyczna roboczej wersji artykułu; H – Statistical analysis of the research material/Analiza statystyczna materiału badawczego; I – Interpretation of the performed statistical analysis/Interpretacja dokonanej analizy statystycznej; K – Technical preparation of manuscript in accordance with the journal regulations/Opracowanie techniczne artykułu zgodne z regulaminem czasopisma; L – Supervision of the research and preparation of the manuscript/Nadzór nad przebiegiem badań i przygotowaniem artykułu

STRESZCZENIE

PIELĘGNIARSTWO W ZAKRESIE WSPARCIA ŻYWIENIOWEGO PACJENTÓW CHORYCH NA NOWOTWORY – STUDIUM PRZYPADKU

Cel pracy. Niedożywienie stanowi poważny problem dla pacjentów chorych na nowotwory.

Materiał i metody. Wybraliśmy metodę badań jakościowych zwaną studium przypadku. Przeprowadzono częściowo ustrukturyzowane wywiady z pacjentami, koncentrując się na zmianach w zaspokajaniu potrzeb żywieniowych wynikających z wpływu choroby. Wywiad uzupełniono obserwacją pacjenta i badaniem fizykalnym. Wykorzystano również standardowe narzędzia pomiarowe.

Wyniki. W zakresie stanu odżywienia we wszystkich trzech przypadkach zdiagnozowano zaburzenia odżywiania: niedobór składników odżywczych w stosunku do zapotrzebowania organizmu. Jeśli chodzi o spożycie płynów, we wszystkich przypadkach stwierdzono ryzyko niedoboru płynów. Na podstawie diagnoz pielęgniarskich zaplanowaliśmy interwencje pielęgniarskie mające na celu wyeliminowanie problemów pacjentów. Przed wypisaniem do opieki domowej pacjenci zostali przeszkoleni przez pielęgniarkę w zakresie interwencji żywieniowych i spożycia płynów. Porównanie wyników przy przyjęciu i po 11 tygodniach wykazało poprawę stanu odżywienia i równowagi płynów we wszystkich 3 przypadkach.

Wnioski. W celu skutecznej systematyzacji wsparcia żywieniowego u pacjentów z nowotworami zalecamy pielęgniarkom stosowanie algorytmu interwencji pielęgniarskiej. Wdrożenie algorytmu interwencji pielęgniarskiej w praktyce potwierdziło jego wpływ na eliminację rozwoju niedożywienia u pacjentów z nowotworami.

Słowa kluczowe: niedożywienie, onkologia, pielęgniarstwo

ABSTRACT

NURSING IN NUTRITIONAL SUPPORT IN CANCER PATIENTS – CASE STUDY

Aim. Malnutrition is a serious problem for cancer patients.

Material and methods. We chose a qualitative research method called case study. A semi-structured interview was conducted with the patients, focusing on changes in the satisfaction of nutritional needs arising from the impact of the disease. The interview was complemented by patient observation and his physical screening examination. We also used standardised measurement tools.

Results. In terms of nutritional status, a nursing diagnosis of Nutritional Imbalance: a deficiency of nutrients with respect to the body's requirements was identified in all three cases. As for the fluid intake, the Risk for deficient fluid intake was determined in all cases. Based on the nursing diagnoses, we planned nursing interventions aimed at eliminating the patients' problems. Prior to discharge to home care, patients were educated by the nurse on nutritional interventions and fluid intake. Comparison of outcomes on admission and after 11 weeks demonstrated improvement in nutritional status and fluid balance in all 3 cases.

Conclusions. For effective systematisation of nutritional support in cancer patients, we recommend nurses to use the nursing intervention algorithm. The implementation of the nursing intervention algorithm into practice, confirmed its impact on the elimination of the development of malnutrition in cancer patients.

Key words: malnutrition, oncology, nursing

INTRODUCTION

Malnutrition is one of the major problems of cancer patients, occurring in 30-85% of patients and in 5-20% of patients it is the direct cause of death in the terminal stage of the disease. Its occurrence mainly depends on the type of cancer, its clinical stage and the age of the patient [1]. Patients with cancer due to nutritional deficiency already show weight loss at the time of diagnosis, which ranges from 15% to 40% depending on the type and stage of cancer and the age of the patient. In addition, the prevalence of malnutrition (in approximately 80% of patients) increases with cancer progression [2,3].

Malnutrition can lead to prolonged hospitalisation, increased, unplanned, and recurrent hospitalisations, higher rates of treatment-related toxicity, reduced or prolonged patient response to cancer treatment, treatment discontinuation, poorer quality of life and an overall worse prognosis [4-6]. It can also significantly increase healthcare costs [1,7,8]. The disease itself, and consequently its various treatments, have a major impact on changes in food and fluid intake needs. Patients predominantly experience inappetence, food aversion, a rapid feeling of fullness, even after ingesting small portions of food, dysgeusia, nausea, vomiting, dry mouth, mouth and throat pain, swallowing difficulties, bloating, diarrhoea, constipation, and weight loss.

To detect eating disorders, nutritional intake, weight change and body mass index should be assessed regularly from the time of cancer diagnosis and repeatedly thereafter, depending on the clinical situation of the patient [9].

There is now evidence that malnutrition can be prevented or reduced through nutritional support [10]. With nutritional support, it is necessary to take into account the issue of when it is beneficial for patients and when it is a burden. When it is beneficial, doctors, nurses, and nutritional therapists participate in it across the continuum of health care, including nursing care, depending on whether patients are undergoing active cancer treatment, are in remission, or are in the palliative stage. Nutritional support must be actively managed and targeted for each patient according to their nutritional needs, clinical status, planned treatment, expected outcome and patient response to treatment [4]. If nutritional status is fine and food intake is maintained during cancer treatment, patients cope better with the side effects of this treatment, are more resistant to infectious and other complications, have a lower risk of postoperative complications, are physically stronger and subjectively feel better overall. It prevents and treats malnutrition, increases effects of anti-tumour therapy, prevents and limits weight loss [11].

Nursing in nutritional support of cancer patients

The nurse has a significant role in the nutritional support of cancer patients [12-15]. Nursing staff perform a wide range of nursing activities. They assess nutritional status, risk of malnutrition and dehydration. They identify nursing diagnoses, plan and ensure that the nutritional needs of cancer patients are met. As part of nurse care, the nurse administers prescribed nutrition-related therapies to patients, administers enteral and parenteral nutrition, regularly monitors and records fluid balance, food intake, weighs the patient, and records the patient's weight. Lee et al. [10] complement nursing interventions with expert consultation and advice on food and fluid selection and modification. Mazurek et al. [16] reported that, the indispensable ability of a nurse is to create patient-specific diagnoses that holistically describe the biopsychosocial status of the care recipient . In the provision of nursing care for oncology patients suffering from malnutrition, several research gaps have been identified. The most prominent include the absence of standardnursing protocols for nutritional care, insufficient ability of nurses to identify malnutrition in a timely manner, limited interdisciplinary collaboration between nurses, nutrition therapist and physicians, as well as inadequate focus on patient and family education and support in the area of nutrition.

MATERIALS AND METHODS

Study design

In order to achieve the objectives, we selected a qualitative research method – a case study. Considering the selection of respondents, we used the following types of case studies: partial (focusing on the need for food intake), structured (pre-prepared questions regarding the eating habits of patients in the premorbid and morbid stage) and illustrative (focusing on the explanation of problems related to food intake). The data collection was carried out in the April of 2024.

Setting and sample

The sample consisted of three patients, men aged 31, 56 and 47 years. The selection of respondents was based on the following inclusion criteria: cancer diagnosed by a physician for over 6 months, inclusion in the process of anti-cancer therapy for the primary oncological disease (chemotherapy and radiotherapy), hospitalisation, problems related to the satisfaction of nutritional needs, absence of cognitive deficits, and patients' willingness to cooperate and communicate. Exclusion criteria were newly diagnosed cancer, inability to cooperate and patients' unwillingness. We used the letters A, B, and C instead of the initials of the patients' first and last names.

Ethical aspects

Consents to obtain empirical data were included in the medical record, which also included instructions and patients' informed consent for the health care provided, which may include questioning. Under the legislation of the Slovak Republic, hospitals also allow the use of medical records for study purposes, provided that the confidentiality of the information is maintained in accordance with the applicable legislation [17].

Data collection/Procedure

A combination of several methods was used to collect empirical data. Semi-structured interview was conducted

with the patients according to a pre-prepared recording sheet. The main topic of the interview was related to changes in the satisfaction of nutritional needs due to thehealth condition . Questions for patients:

1. What were your eating habits before the disease?
2. What are your current eating habits and problems?
3. How much fluid and what kind of fluid did you drink during the day in the period before your illness?
4. What is your current fluid intake?

The interview was complemented by observation of the patients and their physical screening examination. Standard measurement tools were used in the nutritional assessment of the patients to ensure better detection of problems related to the risk of malnutrition:

Mini Nutritional Assessment – Short Form (MNA-SF), the Nottingham Screening Questionnaire and the Nutritional Risk Screening 2002 (NRS 2002). The analysis of medical records was aimed at obtaining data on the health care provided and the health status of the study patients. The data collected were recorded on pre-prepared forms.

RESULTS

We used the letters A, B, and C instead of the initials of the patients' first and last names, and referred to the case reports as case report A, B, and C. The anamnesis and catamnesis of each case are shown in Tab. 1 (case A), Tab. 2 (case B) and Tab. 3 (case C).

Conclusions from anamnesis and catamnesis of diet and fluid intake of cases A, B and C

The following common dietary features were registered in the diet anamnesis of cases A and B: consumption of unhealthy foods, irregular eating, preference for inappropriate food preparation, low intake of fruits and vegetables, limited consumption of dairy products. The presence of inadequate eating habits in the pre-cancer period can be noted. The diet history in case C confirmed healthy eating habits. No significant deficiencies were confirmed in the anamnesis of fluid intake of cases B and C. The patient presented in case A preferred to consume sweetened and energy drinks in the pre-cancer period.

In the diet catamnesis, identical manifestations were registered in all three cases: nausea, dysgeusia, and risk of malnutrition. Differences were noted in terms of regularity

Tab. 1. Anamnesis and catamnesis for case A

Case report A Gender: man Age: 31 years Diagnosis: acute lymphoblastic leukaemia Length of hospital stay: 16 days	
Anamnesis	Catamnesis
Diet: • predominantly junk food • fast food • sporadically vegetables and fruit • low consumption of dairy products • irregularity of eating • lunch and dinner every day, no breakfast • hot meal – once a day (usually lunch) • preparation of food by stewing and frying • consumption of sweets (mainly candy) • no nutritional supplements • no food allergies • without any diet • weight loss of 9 kg in 3 months (15%)	Diet: • dysgeusia • nausea • consumption of hospital food – nutritious diet • accepts about ½ portion of each meal served • no consumption of sweets • negation of favourite foods from the premorbid period • no nutritional supplements Malnutrition risk assessment: NRS 2002: 3 points (risk of malnutrition) MNA-SF: 6 points (malnutrition) Nottingham Screening Questionnaire: 6 points (high risk of malnutrition)
Fluid intake: • predominantly sweetened and energy drinks • 2 l/24 h = plenty of fluids • coffee consumption = 1 coffee/day • alcohol occasionally	Fluid intake: • reduced need to take fluids • water or sweetened tea only • intake per 24 hours: 1200 ml • no consumption of coffee Hydration assessment: Lower fluid intake as opposed to the body requirements – fluid balance

Note MNA-SF - Mini Nutritional Assessment – Short Form, NRS - Nutritional Risk Screening

Tab. 2. Anamnesis and catamnesis for case B

Case report B Gender: woman Age: 56 years Diagnosis: acute myeloid leukaemia Length of hospital stay: 21 days	
Anamnesis	Catamnesis
Diet: • irregular eating – without breakfast • preference for pork and beef • does not eat chicken • fast food • low vegetable and fruit intake (only tomatoes and peppers) • no consumption of dairy products (cheese only) • preparation of food by stewing and frying • after diagnosis of diabetes mellitus - a diabetic diet, which she follows, her diet has improved considerably • sporadic consumption of sweets • no nutritional supplements • no food allergies • weight loss of 10 kg in 3 months (24%)	Diet: • dysgeusia • nausea • diarrhoea (5x/day, thin stools) • consumption of hospital food – diabetic, nutritious diet • preference for a mushy food • irregular eating per os • consumption of nutritional supplements – 2x/day • no consumption of sweets • presence of disorders of the oral mucosa: herpes, aphthae, redness of the oral mucosa • difficulty swallowing food Malnutrition risk assessment: NRS 2002: 2 points (risk of malnutrition) MNA-SF: 5 points (malnutrition) Nottingham Screening Questionnaire: 7 points (high risk of malnutrition)
Fluid intake: • predominantly unsweetened teas and plain water • approx. 2 l/day • 3-4 strong sweetened coffees/day without milk • no alcohol consumption	Fluid intake: • reduced need for fluid intake: plain water and unsweetened tea • intake per 24 hours: 1000 ml Hydration assessment: Lower fluid intake as opposed to the body requirements – fluid balance

Note MNA-SF - Mini Nutritional Assessment – Short Form, NRS - Nutritional Risk Screening

of meals, consistency of preferred food, and enteral nutrition. Fluid intake in all cases was inadequate for the body's needs, with water and sweetened tea predominating.

The analysis of the data was aimed at determining the risk of malnutrition, fluid imbalance and identifying nursing problems of patients.

Patient A: NRS 2002 – Risk of malnutrition, MNA-SF – Malnutrition, Nottingham Screening Questionnaire – High risk of malnutrition, Amount of fluids – 1200 ml/24 h, Signs of dehydration – no.

Patient B: NRS 2002 – Risk of malnutrition, MNA-SF -Malnutrition, Nottingham Screening Questionnaire – High risk of malnutrition, Amount of fluids – 1000 ml/24 h, Signs of dehydration – no.

Patient C: NRS 2002 – Risk of malnutrition, MNA-SF -Malnutrition, Nottingham Screening Questionnaire – High risk of malnutrition, Amount of fluids – 1300 ml/24 h, Signs of dehydration – no.

Based on these factors, nursing diagnoses (NANDA) were formulated. Through the measurement tools used, the presence of risk of malnutrition or malnutrition was demonstrated in all three cases. The measurement tools have good specificity (>80%) but different sensitivity [18]. For the purposes of our study, it was important to identify the risk of malnutrition regardless of its degree. In all three cases, a nursing diagnosis of Imbalanced nutrition: less than body requirements was identified within the nutritional status. The common factor associated with the nutritional problem was nausea. The second factor associated with the nursing diagnosis varied from patient to patient: case A – inadequate food intake, case B – irregular food intake, case C – changed ability to take food.

The identifying features of the nursing diagnosis were different in each case:

- case A – altered taste, intake less than the recommended dietary allowances, weight loss of 3 kg in 3 months
- case B – loss of appetite, diarrhoea, painful, inflamed oral cavity, weight loss of 10 kg in 3 months
- case C – difficulty swallowing, weakness of chewing muscles weight loss of 20 kg in 3 months.

As for the fluid intake, the Risk for deficient fluid volume was determined in all cases. The same risk factor was nausea and low fluid intake per os as opposed to the body's requirements. Diarrhoea was also identified as a risk factor in case B and difficulty swallowing as a risk factor in case C.

Based on the nursing diagnoses, we planned nursing interventions focused on eliminating or reducing the patients' problems.

Nursing interventions in nutritional support:

- conduction of a nutritional status assessment every 7 days,
- monitoring and recording of total daily food intake,
- regularly weighing of the patient one time per week,
- administration of nutritional supplements as prescribed by the physician – sipping (case B, case C),
- administration of antiemetic therapy as prescribed by the physician,
- implementation of interventions to alleviate nausea (ventilation, breathing, smaller portions, choice of food within the prescribed diet, positioning, chilled non-carbonated drinks),
- providing education focusing on cancer patient nutrition,
- administration of zinc, alpha-lipoic acid (ALA), ginkgo biloba, pilocarpine to improve appetite as prescribed by the physician [19],
- informing the patient of the need to take fluids,
- recording fluid balance,
- providing patients with 100 ml of selected fluids/hour,
- monitoring objective indicators of hydration or dehydration 3x/day,
- administration of medication as prescribed by the physician,
- providing education to patients on fluid intake.

Nursing interventions were implemented in all three cases throughout the hospitalisation. Prior to discharge to home care, patients were educated by the nurse on nutritional interventions and fluid intake. At the follow-up outpatient vist after 11 weeks, patients were reassessed for nutritional status and fluid balance (Tab. 4).

Comparison of results on admission and 11 weeks documented improvement in nutritional status and fluid balance in all 3 cases. Despite the fact that the patients remained at risk of malnutrition, an improvement in their

Tab. 3. Anamnesis and catamnesis for case C

Case report C Gender: men Age: 47 years Diagnosis: acute lymphoblastic leukaemia Length of hospital stay: 18 days	
Anamnesis	Catamnesis
Diet: • good appetite • frequent consumption of vegetables (except onions and garlic) and fruit • sporadic consumption of traditional foods • regular consumption of cereal products • 1-2 times a year smoked meat • cooking and stewing • without any diet • no nutritional supplements • no food allergies • weight loss of 20 kg in 3 months (29%)	Diet: • dysgeusia • nausea • difficulty swallowing and chewing • oral mucosal disturbances present: dryness of the oral cavity, rashes and herpes on the lips, aphthae • burning sensation after water intake • preference for mushy food • consumption of nutritional supplements – 3x/day • application of artificial saliva • consumption of hospital food – nutritious diet Malnutrition risk assessment: NRS 2002: 3 points (risk of malnutrition) MNA-SF: 5 points (malnutrition) Nottingham Screening Questionnaire: 6 points (high risk of malnutrition)
Fluid intake: • predominantly water and mineral water • occasionally sweetened tea • 2 l/24 h = plenty of fluids • coffee consumption = 1 coffee/day • denies alcohol (14 years abstinent alcoholic)	Fluid intake: • predominantly water • occasionally sweetened tea • intake per 24/h: 1300 ml • no consumption of coffee Hydration assessment: Lower fluid intake as opposed to the body requirements – fluid balance

Note MNA-SF - Mini Nutritional Assessment – Short Form, NRS - Nutritional Risk Screening

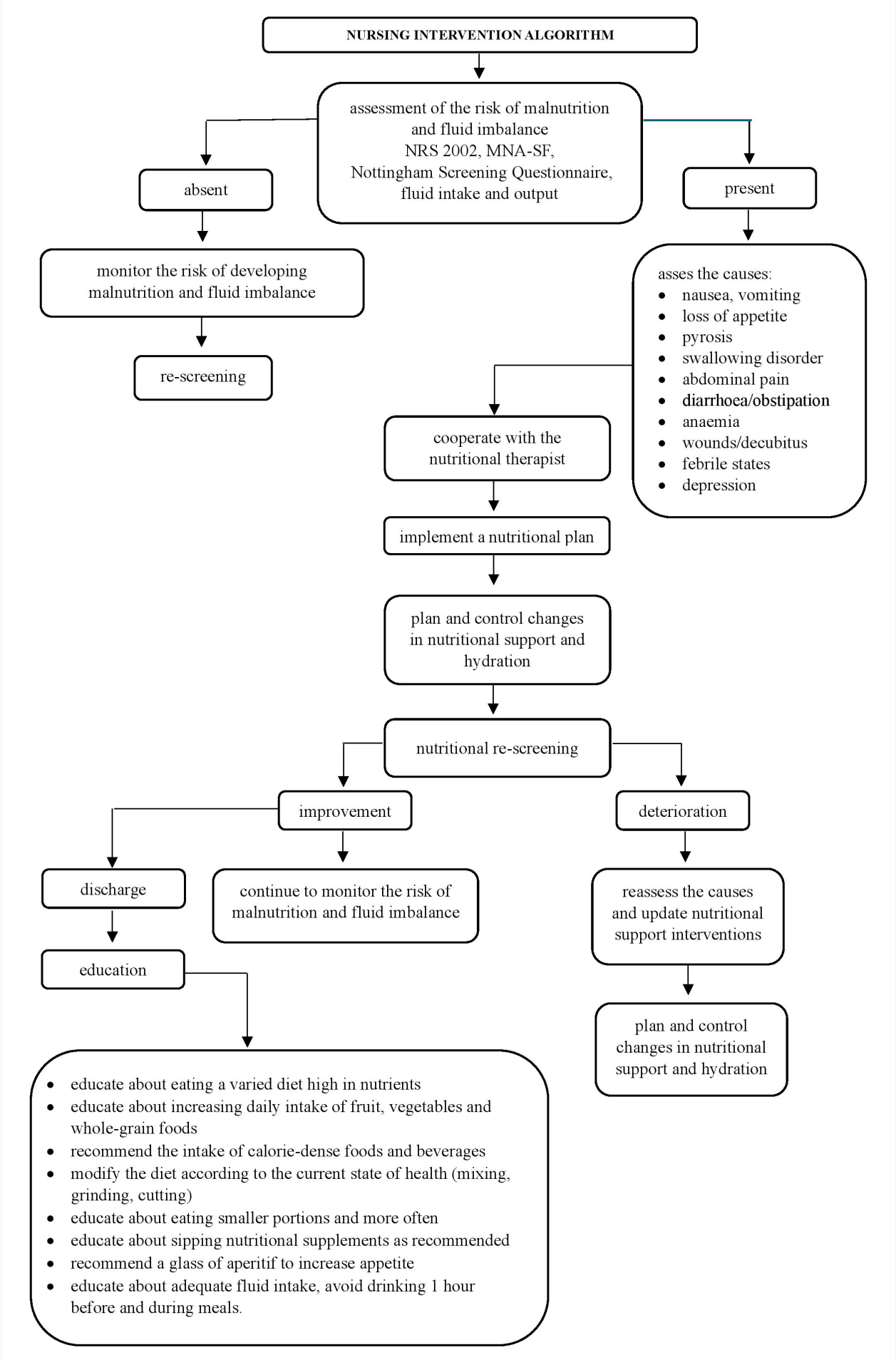

Fig 1. Nursing Intervention Algorithm

Tab. 4. Comparison of nutritional status and fluid balance on admission and after 11 weeks

	Patient	A		B		C	
		On admission	After 11 weeks	On admission	After 11 weeks	On admission	After 11 weeks
Risk of malnutrition	NRS 2002	3 pts	2 pts	2 pts	1 pt	3 pts	2 pts
	MNA-SF	6 pts	10 pts	5 pts	8 pts	5 pts	8 pts
	Nottingham Screening Questionnaire	6 pts	3 pts	7 pts	5 pts	6 pts	5 pts
Fluid imbalance	Amount of fluids	1200 ml/24 h	1800 ml/24 h	1000 ml/24 h	2000 ml/24 h	1300 ml/24 h	1700 ml/24 h
	Signs of dehydration	no	no	no	no	no	no

Note MNA-SF - Mini Nutritional Assessment – Short Form, NRS - Nutritional Risk Screening

nutritional status and maintenance of fluid balance could be noted. For effective systematisation in nutritional support in cancer patients, we recommend use of the nursing intervention algorithm (Fig. 1).

The implementation of the nursing intervention algorithm in practice, confirmed its impact on the elimination of the development of malnutrition in cancer patients.

DISCUSSION

The prognosis of patients with malnutrition is to a significant extent directly proportional to the level of effective risk management in the context of a responsible and proactive approach by nurses and nursing staff who are directly responsible for meeting the patient's biological needs [20]. Through the planning, implementing and evaluating of nutritional support interventions in our cases, we relied on the Ministry of Health's National Standardised Practice for the nursing management of patients at risk of developing malnutrition from 2023 [21]. Nutritional intervention should be actively managed and targeted for each patient and it should include individual dietary measures according to spontaneous food intake, tolerance and efficiency [4]. Based on the European multinational survey on current practices of clinical nutritional intervention, Caccialanza, Lobascio [4,22] point out the problem of late diagnosis of malnutrition and the implementation of nutritional interventions in the terminal stage of the disease, thus eliminating the possibility of improving the patient's clinical condition. Nurses play an important role in the multidisciplinary team that is involved in the management of nutritional support care for cancer patients. A number of standardised nutritional risk assessment tools are currently available to nurses – e.g. MUST (the Malnutrition Universal Screening Tool), NRS-2002 (the Nutritional Risk Screening-2002), the Mini Nutritional Assessment – Short Form (MNA-SF), the Nottingham Screening Questionnaire and others. For nutritional risk assessment of adult cancer patients, the most commonly recommended tools by experts are the SGA (Subjective Global Assessment) and PG-SGA (Patient-Generated Subjective Global Assessment) tools. In order to assess the risk of malnutrition in our cases, we used the Mini Nutritional Assessment – Short Form (MNA-SF), the Nottingham Screening Questionnaire and the Nutritional Risk Screening 2002 [23]. In the case studies, we did not use the expert-recommended standardSGA tool as it does not use explicit numerical values. When used in isolation, it has low sensitivity to metabolic changes that occur in cancer patients [5,24]. Similarly, we did not use BMI to assess the risk of malnutrition as Ravasco [6] points out its low sensitivity for detecting changes in nutritional status, especially in obese patients. Nutritional risk screening allows the nurse to identify cancer patients at risk of malnutrition as early as possible [25]. It should be implemented as soon as possible after cancer diagnosis, on admission to hospital and, if necessary, at any time during treatment [3,5,25]. Patients with cancer already show weight loss due to nutritional deficiency at the time of diagnosis, ranging from 15% to 40% depending on the type and stage of cancer and the age of the patient [2,3,26].

Weight loss was also registered in our cases, most significantly in patient C (29%), least in patient A (15%). The indicated anti-cancer treatment induces a wide range of acute and late toxic effects. These interfere, among other things, with appetite and change in eating habits. Salvetti et al. [27] included fatigue, pain, nausea, constipation, diarrhoea and poor sleep quality among the adverse effects of anti-cancer treatment. Togni et al. [28], in addition to these side effects, listed others related to the need for nutrition – vomiting, early satiety, changes in olfactory sensation, mucositis, stomatitis, oesophagitis, xerostomia, asthenia, etc. Andrade et al. [19], and Alfaro et al. [29] point to dysgeusia (a general definition of any change in normal appetite) as a common complication that directly affects nutritional status, causes loss of appetite and decreased food intake.

In our cases A, B, and C, we also observed some of the side effects of anti-cancer treatment. The shared side effect in all cases was nausea and dysgeusia. These were also the only ones recorded in case A. According to cases B and C, were also reported other problems – difficulty swallowing and chewing, disruption of the oral mucosa (redness, dryness, rashes, aphthae, herpes). A burning sensation after water intake was also present in case C and diarrhoea in case B at a frequency of 5 times a day. Nelms, Sucher, Long [30] point out not only a nutritional problem, but also the occurrence of dehydration. Although we did not observe decreased fluid volume in cases A, B, and C, based on the above defining features, all patients were at risk for deficient body fluid volume associated with anti-cancer therapy. Based on the problems identified, we implemented and recorded nursing interventions in all cases in the medical record in accordance with the algorithm outlined in the flowchart.

In order to avoid the situation confirmed by Planas et al. [31] in the PREDYCES study, which revealed that 36.4% of cancer patients were at nutritional risk at the time of hospital discharge and only 1/3 of them were receiving nutritional support, it is necessary to recognise the non-negligible role of nurses in meeting the need for nutrition and fluid intake. The significant contribution of nurses in nutritional support is also confirmed by Gan et al. [12]; Liposits et al. [13]; Sulosaari et al. [14]; Lavdaniti [15]. In this context, Gan et al. [12] point out the need for nurse education in nutritional support. An important tool in nurse education, validated by Al Wachami et al. [32], was the Scala Build Tool (SBT). The results indicated that simulation-based training (SBT) is an effective training method used in many clinical settings, including oncology. DiMaria-Ghalili et al. [33] concluded in their review study that nurses should update their nutrition knowledge of this patient group throughout their professional career. Nurses with sufficient knowledge of nutritional support for cancer patients are involved in improving their nutritional status and overall quality of life.

CONCLUSIONS

The nutrition of cancer patient is extremely important for the good outcome of anti-cancer treatment as well as for the patient's overall quality of life. Oncology patients face a wide range of problems with food intake, digestion and overall nutrient utilisation in the body. Nurses play an important role in addressing the problems of these patients by planning and implementing nursing interventions. A comparison of clinical data obtained at the time of patient admission and after an 11-week interval demonstrated an improvement in nutritional status and stabilisation of fluid balance in all three patients. Although all remained at risk of malnutrition, the observed outcomes suggest a positive trend in nutritional profile improvement and effective hydration management. Therefore, to enhance the efficiency and standardisation of nutritional support in oncology patients, we recommend the implementation of a nursing intervention algorithm in clinical practice.

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Manuscript received: 12.05.2025
Manuscript accepted: 16.07.2025