Instructional technology for nursing diagnosis and therapy after bariatric surgery

Tecnologia instrucional para diagnóstico e terapêutica de enfermagem após cirurgia bariátrica

Tecnología instruccional para el diagnóstico y la terapéutica de enfermería después de una cirugía bariátrica

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Abstract

Objective: To assess a case study instructional technology for nurses who work in patient care in the postoperative period of bariatric surgery.

Methods: This is applied research on technological development carried out in a literature review, preparation and instructional material assessment by 20 specialist nurses.

Results: The instructional material consists of 10 case studies associated with protocols with nursing diagnoses and interventions. The material was assessed as adequate for most criteria of sufficiency of clinical indicators for nursing diagnosis elaboration; frequency with which the diagnoses presented in the instructional material were or could be used in the postoperative care of bariatric patients; clarity and representativeness of the content of the case studies.

Conclusion: The cases were assessed as an instructional technological resource relevant to the training of nurses with potential for the clinical judgment process in the postoperative period of bariatric surgery.

Resumo

Objetivo: Avaliar uma tecnologia instrucional de estudos de caso para enfermeiros que atuam na assistência ao paciente em pós-operatório de cirurgia bariátrica.

Métodos: Pesquisa aplicada de desenvolvimento tecnológico realizada em três etapas: revisão da literatura; elaboração e avaliação do material instrucional por 20 enfermeiros especialistas.

Resultados: O material instrucional é composto de 10 estudos de caso associados a protocolos com diagnósticos e intervenções de enfermagem. O material foi avaliado como adequado para a maioria dos critérios de suficiência de indicadores clínicos para a elaboração do diagnóstico de enfermagem; frequência com que os diagnósticos apresentados no material instrucional eram ou poderiam ser usados no cuidado pós-operatório do paciente bariátrico; na clareza e representatividade do conteúdo dos estudos de caso.

Conclusão: Os casos foram avaliados como um recurso tecnológico instrucional relevante para a capacitação de enfermeiros com potencial para o processo de julgamento clínico em pós-operatório de cirurgia bariátrica.

Resumen

Objetivo: Evaluar una tecnología instruccional de estudios de caso para enfermeros que actúan en la asistencia al paciente en post operatorio de cirugía bariátrica.

Métodos: Investigación aplicada de desarrollo tecnológico realizada en tres etapas: revisión de la literatura; elaboración y evaluación del material instruccional por 20 enfermeros especialistas.

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Conflicts of interest: nothing to declare.

Resultados: El material instruccional está compuesto por 10 estudios de caso asociados a protocolos con diagnósticos e intervenciones de enfermería. El material fue evaluado como adecuado para la mayoría de los criterios de suficiencia de indicadores clínicos para la elaboración del diagnóstico de enfermería; frecuencia con la que los diagnósticos presentados en el material instruccional eran o podrían ser usados en el cuidado post operatorio del paciente bariátrico; en la claridad y representatividad del contenido de los estudios de caso.

Conclusión: Los casos fueron evaluados como un recurso tecnológico instruccional relevante para la capacitación de enfermeros con potencial para el proceso de juzgamiento clínico en el post operatorio de cirugía bariátrica.

Introduction

Obesity is a chronic, inflammatory disease, determined by the excessive accumulation of body fat that leads to weight gain to the point of compromising individuals' health. In Brazil, 19.8% of the population is already obese and the disease has shown a rapid and growing expansion in the country, with a 67% increase in its prevalence in the last 12 years, as well as a large percentage of bariatric surgeries, the which makes the country rank second in the world in the number of surgery performed.[1]

Bariatric surgery is described as the most effective treatment for obesity, as its effects go beyond weight loss, reaching remission of comorbidities, despite the need for lifestyle changes, always prior to the procedure and continuing after it.[2,3]

The postoperative conditions of bariatric surgery, considering the high risk for surgery and other comorbidities that may be associated, require accurate assessments and qualified clinical judgment theoretically and methodologically based to develop high standards of care and reduce risks for a safe and effective postoperative recovery of patients.[4,5] However, nursing professionals may have difficulty in performing clinical judgment accurately with diagnostic and therapeutic components. Thus, it is relevant to investigate the validity of the relationships between clinical manifestations and nursing diagnoses.[6]

The nursing process and classification systems in care practice help in conducting clinical nursing judgment by offering appropriate instruments and content. Thus, it becomes possible to establish a clinical judgment guided by accurate nursing diagnoses and appropriate interventions, with a view to positive results.[7] Clinical judgment and clinical reasoning are sometimes used as synonyms, however, the most appropriate would be to consider the first as the end point of the thought process, while the second would address the cognitive processes.[8] Both can be improved through continuous and specific training, which represents a challenge in the teaching-learning process.

A study found a drop in the number of false negative and positive diagnoses, and an increase in diagnostic accuracy after training to standardize the contents studied.[9] Case reports are relevant to advances in health, allowing the discovery of new diseases and unexpected effects, the study of mechanisms and playing an important role in medical education.[10] In a way, these benefits are incorporated into nursing through case studies.

Clinical case studies are widely used in nursing education in Brazil, the United States of America, Korea, Taiwan, and Australia to encourage interaction between faculty and students, promote autonomy, explore thinking styles, and promote critical and reflective analysis employed for the resolution of problem situations. In the combination of clinical case study, standardized language systems and nursing process, benefits can be verified by the example of cases for clinical judgment, and incorporation of clinical evidence that facilitates diagnostic reasoning.[11-13]

Despite the extensive advantages of clinical case studies, in the literature there are only guidelines for writing clinical case reports such as the Case Report or CARE Guideline and Surgical CAse REport (SCARE) Guidelines.[10] Thus, it is relevant to prepare and assess clinical case studies oriented to the nursing process. Thus, the present study aims to assess an instructional technology of case studies for nurses who work in patient care in the postoperative period of bariatric surgery.

Methods

This is applied research on technological development, which followed an integrative review, in-

structional material preparation and assessment including case studies.

The integrative review followed the guiding question: What clinical indicators and nursing diagnoses regarding patients in the postoperative period of bariatric surgery? He used the Online Medical Literature Analysis and Retrieval System (MEDLINE) and Latin American and Caribbean Health Sciences Literature (LILACS) databases, including original articles published from 2013 to 2018 in Portuguese, English or Spanish using the keywords "bariatric surgery" and "nursing". 567 articles were identified, after applying the inclusion criteria, 108 titles were selected, and after qualitative analysis, 07 articles provided evidence for the material preparation.

For the preparation of case studies, the clinical and diagnostic indicators found in the review were considered, as well as ten real cases collected by the researchers in patients in the postoperative period of bariatric surgery in a university hospital, from December 2018 to February 2019, using the institution's standardized nursing instruments. It was decided to join these actions in order to increase data consistency. In order to ensure standardization, the case studies were built following the guidelines of Galdeano, Rossi and Zago.[14]

The instructional material developed is based on a teaching-learning approach based on case studies. It comprises ten real cases and synthesized evidence from the integrative review: clinical indicators, diagnoses and nursing interventions. From a conceptual point of view, the categorical systems of Basic Human Needs (BHN) and Domains and Classes from NANDA International Inc. (NANDA-I) were used to organize clinical indicators and nursing diagnoses. BHNs aimed at free interpretation of needs that can be identified in the case through the data contained therein. Domains and classes, on the other hand, are the organization structure of human responses, the NANDA-I nursing diagnoses, which are presented in each case.[15,16] For example: Clinical indicators: Fetching, increased salivation and bitter taste, treatment regimen. Basic Human Needs: Food (nutrition) and elimination. NANDA-I: Domain: comfort, Class: physical comfort. Diagnosis: Nausea

related to the treatment regimen, gastric distension, evidenced by the urge to vomit, excessive salivation and bitter taste in the mouth.

The cases also incorporate nursing interventions and activities based on the Nursing Interventions Classification (NIC). To support the relationship between diagnoses and interventions, literature was used relating NANDA-I, NIC and researchers' clinical experience.[17]

Instructional material content assessment was carried out by nurses who acted as judges, meeting the following inclusion criteria: surgical unit care nurses with at least two years of experience in caring for bariatric patients in the immediate, mediate and late postoperative period during hospitalization; technical committee members of the nursing process/nursing care systematization of a university hospital in southeastern Brazil.

For judges' characterization, the following information was requested: sex, age, institution in which they work, degree, graduation time, practice time, uses or used NANDA-I nursing diagnoses in their clinical practice and uses or used NIC nursing interventions in clinical practice. The judges received an invitation letter via e-mail, the Free and Informed Consent Form (FICF) and the instruments with three elements to be assessed: 1) existence of sufficient clinical indicators for nursing diagnosis elaboration; 2) frequency with which the nursing diagnoses presented in the instructional material were or could be used in the postoperative care of bariatric patients; 3) content adequacy of case studies.

To assess clinical indicator adequacy, a dichotomous scale of attributes "agree" or "disagree" was used, without graduation, giving the judge the opportunity to suggest other indicators.

To assess the frequency of potential and actual use of nursing diagnoses, an ordinal 4-point scale was used with the attributes expressed in the labels "never", "rarely", "often" and "always". The chi-square test and Fisher's exact test were used to verify the difference between the proportions of the categories. For the statistical data analysis, the IBM SPSS Statistics version 24 and R version 3.6.1 programs were used.

To assess case study adequacy, a dichotomous scale was used with attribute of care or non-compliance, compatibility of elements of nursing diagnoses and interventions, clarity of writing, and representativeness of the case in terms of real situations. Agreements were obtained by observed frequency and the percentage of agreement and the confidence interval of the proportion were calculated using the Wilson score interval. The item assessed was considered valid with the minimum value in the range calculated by the Wilson score equal to or greater than 70% (0.70).

The research was approved by the Institutional Review Board, under Opinion 3.056.914, under CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration) 03115218.4.0000.5071.

Results

The group of 20 nurses and judge nurses was 75% women. The average age presented was 35 years. Regarding the degree of title, 70% were specialists, 15% had a master's degree and 15% were graduated. The average time since training was 9.95 years, while the average time working in bariatric patient care was 4.65 years. Regarding the use of NANDA-I nursing diagnoses in clinical practice, 100% reported using it daily in their professional practice, and 85% reported using the NIC nursing interventions in their clinical practice. Of twenty-one groups of clinical indicators incorporated in the study, 18 (85.7%) were assessed as relevant and sufficient for the decision on the nursing diagnosis, when reaching a value equal to or greater than 70.0% in the confidence interval of ratio (Table 1).

In Case 1, dyspnea, fatigue and obesity indicators were not considered sufficient to judge activity intolerance. In Case 3, abdominal pain, nausea, absence of flatus and abdominal distension were not enough to identify dysfunctional gastrointestinal motility; in the same case, vomiting desire, increased salivation and bitter taste were not considered sufficient for the decision to diagnose nausea. All other pairs of clinical-diagnostic nursing indicators were assessed as relevant according to Table 1. Table 2 presents data regarding the frequency assessment with which the nursing diagnoses presented in the instructional material were or could be used in patient postoperative care.

The judges indicated the following diagnoses with statistical significance: bathing self-care deficit, impaired tissue integrity, dysfunctional gastrointestinal motility, nausea, ineffective breathing pattern, ineffective peripheral tissue perfusion, and risk for infection. Thus, risk for infection (95.0%) and impaired tissue integrity (85.0%) had higher prevalence for the "always" response, while ineffective breathing pattern (75.0%), bathing self-care deficit (70.0%), dysfunctional gastrointestinal motility (70.0%) and ineffective peripheral tissue perfusion (65.0%) achieved higher prevalence for the response "often". In the nausea diagnosis assessment, there was similarity for the categories of responses "often" (55.0%) and "always" (40.0%), and the same happened in the assessment of total responses (often: 47.9%; always: 38.2%). All cases were considered clear and representative of real situations of patients in the immediate postoperative period and mediated for minimally 95% of the judges. All values calculated in the confidence interval of ratio exceeded the agreed minimum value of 70% (0.70). Values obtained and calculated are detailed in Table 3.

Discussion

Although extremely important for the clinical guidance of nurses, using nursing diagnoses is not a simple task, being subject to errors. To reduce interpretation failures, nurses must develop intellectual, interpersonal and technical skills. Therefore, it is necessary to know and think quickly and logically, in case of the association of signs and symptoms with their possible causes.[13,18] The reasoning process involves recognition of clues or evidence that must be interpreted and grouped together to produce a diagnostic hypothesis.[19]

Clue sufficiency will contribute to the reasoning and diagnostic declaration. In this research, clues were incorporated into case studies, being called

Table 1. Ratio of agreement with sufficiency of clinical indicators for the elaboration of nursing diagnosis in case studies

Case	Clinical indicators	Nursing diagnosis	Ratio of agreement n(%)	Confidence interval of ratio	Assessed as relevant
Case 1	Dyspnea on exertion, fatigue, dyspnea, and weakness	Activity intolerance	18(90.0)	70.0 to 97.0	Yes
	Dyspnea, fatigue and obesity	Ineffective breathing pattern	17(85.0)	64.0 to 94.0	No
	Capillary refill time > 3 seconds, decreased peripheral pulses and paresthesia (numbness in hands)	Ineffective peripheral tissue perfusion	19(95.0)	76.0 to 99.0	Yes
	Insufficient diabetes management, insufficient food intake and alteration in mental status	Risk for unstable blood glucose level	18(90.0)	70.0 to 97.0	Yes
Case 2	Surgical wound (tissue damage), acute pain and surgical procedure	Impaired tissue integrity	20(100.0)	84.0 to 100.0	Yes
	Pain on superficial abdominal palpation, expressive behavior and facial expression of pain	Acute pain	19(95.0)	76.0 to 99.0	Yes
Case 3	Abdominal pain, nausea, absence of flatus and abdominal distension	Dysfunctional gastrointestinal motility	16(80.0)	58.0 to 92.0	No
	Vomiting desire, increased salivation and bitter taste	Nausea	17(85.0)	64.0 to 94.0	No
	Sedentary lifestyle, bed rest (immobility) and history of activity intolerance (tiredness and pain)	Risk for activity intolerance	20(100.0)	84.0 to 100.0	Yes
Case 4	Dependence for self-care, pain, weakness in right inferior leg and paresis in lower limbs	Feeding self-care deficit/Bathing self-care deficit	18(90.0)	70.0 to 97.0	Yes
	Facial expression and pain report	Acute pain	19(95.0)	76.0 to 99.0	Yes
	Destroyed tissue (pressure injury)	Impaired tissue integrity	18(90.0)	70.0 to 97.0	Yes
Case 5	Impaired balance, impaired walking, impaired mobility and reduced strength in lower limbs	Risk for falls	20(100.0)	84.0 to 100.0	Yes
	Vomiting desire and increase in salivation	Nausea	19(95.0)	76.0 to 99.0	Yes
Case 6	Abnormal breathing pattern, fatigue and dyspnea	Ineffective breathing pattern	19(95.0)	76.0 to 99.0	Yes
Case 7	Surgical wound, peripheral venous access and alteration in skin integrity	Risk for infection	18(90.0)	70.0 to 97.0	Yes
	Self-report of intensity using standardized panel scale	Acute pain	18(90.0)	70.0 to 97.0	Yes
	Alteration in skin turgor, increased heart rate, decreased urine output, decreased blood pressure and thirst	Deficient fluid volume	19(95.0)	76.0 to 99.0	Yes
Case 8	Nasal flaring, use of accessory muscles to breathe and dyspnea	Ineffective breathing pattern	18(90.0)	70.0 to 97.0	Yes
Case 9	Postoperative period of major surgery, total anesthesia time > 90 minutes, impaired mobility (pain) and obesity	Risk for venous thromboembolism	18(90.0)	70.0 to 97.0	Yes
Case 10	Tachycardia, anxiety and restlessness, jugular vein distension and prolonged capillary refill time	Decreased cardiac output	20(100.0)	84.0 to 100.0	Yes

Table 2. Distribution of frequency with which judges considered the actual or potential occurrence of nursing diagnoses in bariatric patient postoperative care

NANDA-I diagnosis	Never n(%)	Rarely n(%)	Often n(%)	Always n(%)	p-value
Decreased cardiac output	0(0.0)	10(50.0)	10(50.0)	0(0.0)	0.999
Feeding self-care deficit	0(0.0)	9(45.0)	9(45.0)	2(10.0)	0.077
Bathing self-care deficit	0(0.0)	2(10.0)	14(70.0)	4(20.0)	0.004*
Acute pain	0(0.0)	0(0.0)	6(30.0)	14(70.0)	0.115
Impaired tissue integrity	0(0.0)	0(0.0)	3(15.0)	17(85.0)	0.003*
Activity intolerance	0(0.0)	3(15.0)	11(55.0)	6(30.0)	0.081
Impaired physical mobility	0(0.0)	2(10.0)	10(50.0)	8(40.0)	0.064
Dysfunctional gastrointestinal motility	0(0.0)	2(10.0)	14(70.0)	4(20.0)	0.004*
Nausea	0(0.0)	1(5.0)	11(55.0)	8(40.0)	0.018*
Ineffective breathing pattern	0(0.0)	2(10.0)	15(75.0)	3(15.0)	< 0.001*
Ineffective peripheral tissue perfusion	0(0.0)	5(25.0)	13(65.0)	2(10.0)	0.006*
Risk for unstable blood glucose level	0(0.0)	0(0.0)	7(35.0)	13(65.0)	0.188
Risk for infection	0(0.0)	0(0.0)	1(5.0)	19(95.0)	< 0.001*
Risk for activity intolerance	0(0.0)	3(15.0)	10(50.0)	7(35.0)	0.152
Risk for falls	0(0.0)	0(0.0)	8(40.0)	12(60.0)	0.503
Risk for venous thromboembolism	0(0.0)	3(15.0)	11(55.0)	6(30.0)	0.081
Deficient fluid volume	0(0.0)	5(25.0)	10(50.0)	5(25.0)	0.317
Total	0(0.0)	47(13.8)	163(47.9)	130(38.2)	< 0.001*

(*) Chi-square test for one sample and Fisher's exact test for values less than 5; being statistically significant when p<0.05

"clinical indicators". These indicators matched to nursing diagnoses were assessed by judges and questioned their sufficiency as evidence for the diagnostic decision. In three situations it was judged that such indicators would not be sufficient to support the decision. Even if the study did not investigate the reason for this judgment of insufficiency, it is possible to assume some explanatory hypotheses.

Table 3. Assessment of cases according to criteria of compatibility of the elements of nursing diagnoses and interventions, clarity of writing and representativeness of the case in terms of real situations of patients in the postoperative period of bariatric surgeries

Case studies	Case study judged regarding clarity in writing		Case study reflects situations in postoperative occurrences	
	n(%)	Interval %	n(%)	Interval %
1	19(95.0)	76.0 to 99.0	20(100.0)	84.0 to 100.0
2	19(95.0)	76.0 to 99.0	19(95.0)	76.0 to 99.0
3	19(95.0)	76.0 to 99.0	20(100.0)	84.0 to 100.0
4	18(90.0)	70.0 to 97.0	20(100.0)	84.0 to 100.0
5	20(100.0)	84.0 to 100.0	20(100.0)	84.0 to 100.0
6	20(100.0)	84.0 to 100.0	20(100.0)	84.0 to 100.0
7	20(100.0)	84.0 to 100.0	20(100.0)	84.0 to 100.0
8	20(100.0)	84.0 to 100.0	20(100.0)	84.0 to 100.0
9	20(100.0)	84.0 to 100.0	20(100.0)	84.0 to 100.0
10	20(100.0)	84.0 to 100.0	20(100.0)	84.0 to 100.0

First, it is common for professionals to look for elements of familiarity and consider, in cases, elements compatible with their working contexts to facilitate the recognition of patterns called recognition-primed.[12] Thus, if the embedded indicators are not those commonly considered from judges' clinical experience, it is possible to disregard, even if pointed out in the reviewed studies. It should be emphasized that the judges were from the same institution; therefore, this hypothesis becomes plausible, at least in part.

Another hypothesis can be attributed to the question of properties of clinical indicators (clues). Accurate judgment may depend on the degree of clue relevance, specificity and coherence.[20] Clues are useful and may represent the information used in a hypothetical-deductive model as confirmation elements inherent to the interpretation of the patient's "story" or serve reasoning based on Bayesian perspective.[12,21]

Clues may express greater refinement of clinical and epidemiological information and may communicate properties of clinical indicators such as sensitivity, specificity and predictive values allowing a more analytical reasoning to be applied.[12]

It is appropriate to review case studies 1 and 3 in relation to diagnostic indicator pairs that were not assessed as relevant, including incorporating an aggregation of study findings to limit clues to more representative ones.

The literature review indicated seventeen nursing diagnoses compatible with patients' situation in the postoperative period of bariatric surgery. However, the judges considered frequent, with the certainty of statistical significance, only seven diagnoses: bathing self-care deficit, impaired tissue integrity, dysfunctional gastrointestinal motility, nausea, ineffective breathing pattern, ineffective peripheral tissue perfusion, and risk for infection.

Once again it can be assumed that judges' characteristics may be the interfering one. It is common for clinicians, especially the most experienced, to use heuristics to generate cognitive economy when dealing with more complex situations.[12] Since the 1990s, in medicine, there are studies that point to the idea of economics of specialists in fundamentally discarding excessive data and of lesser relevance to focus on the most significant, including greater semantic richness.[22] It is common for clinicians to also prioritize certain diagnoses that seem more representative of the patient situation. Therefore, it is not surprising to verify a smaller selection of diagnoses when compared to those compiled from the literature that tends to incorporate the most prevalent, probable or even possible diagnoses. This characteristic of diagnostic research provides a broader range of options than individual clinical judgment.

While specific limits have been pointed out in the clinical indicator-nursing diagnosis relationship and in the probable occurrence of nursing diagnoses, a full adequacy of the instructional resource was indicated by the judges.

Twenty nurse judges with experience in patient care in bariatric surgery and in the use of NANDA-I taxonomy and NIC nursing interventions in their clinical practice participated in the assessment of instructional technology. These characteristics are fundamental and sufficient to ensure greater accuracy during the instrument assessment.[23,24] Therefore, their collective judgment confers a satisfactory degree of acceptance of the content value of the case studies developed.

In addition to the written case technology used in this study, others can be applied in face-to-face interactions in face-to-face environments or through virtualizations to improve clinical judgment. Clinical simulations, computer simulations, or other synchronous and asynchronous commu-

nication strategies such as mobile devices, forums, and chats play a significant role in driving the learning of clinical cases.[11,12] Scripts, vignettes, conceptual maps and V diagrams are other strategies that can develop diagnostic and therapeutic reasoning, including articulating it to nursing theories.[13,25] It is estimated that different educational guidelines and teaching-learning strategies may cover different teaching contexts or adapt better or worse to individual learners' styles, which may justify the continuous development and assessment of educational technologies.

In general, in this research, high rates of favorable agreement were recorded; however, methodologically, the authors chose to use data within a calculated interval, in order to allow greater confidence about the external validity of the findings.

Although the limitation of this research did not include a heterogeneity of judges in terms of different geographic regions, it is understood that the considerations of the discussion have made clear to readers the possible limits of interpretation and use of the findings of this research. However, the benefits of assessing instructional technology and disseminating the results of this process to the scientific community outweigh the limitations.

It is understood that instructional technologies built on indicators and clinical evidence of practical reality are an important tool, conferring accuracy of care for these patients at a time relevant to their recovery process with the minimum of possible complications.[26]

Conclusion

The instructional material, containing 10 case studies in conjunction with a protocol of nursing diagnoses, interventions and activities, based on clinical evidence and standardized classifications, allows nurses to train their diagnostic reasoning to improve their clinical judgment and make decisions safely, as well as contribute to the planning of better patient care in the postoperative period of bariatric surgery and documentation of the nursing process. The material was assessed as adequate, with clear writing and representative of typical situations of patients in the postoperative period of bariatric surgery, with a review for Cases 1 and 3 of the clinical diagnosis-indicator pair used. The evidence-based construction of the literature and assessment of case studies by judges with expertise in the care of these patients contributed to the reliability of results.

Collaborations

Chaves ER, Primo CC, Brandão MAG, Furieri LB, Lopes AB, Lima EFA and Bringuente MEO contributed to the design of the project, data analysis and interpretation, article writing, relevant critical review of intellectual content and approval of the final version to be published.

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