EVALUATION OF THE EFFECTIVENESS OF INTERVENTION WITH EDUCATIONAL MATERIAL IN SURGICAL PATIENTS: AN INTEGRATIVE LITERATURE REVIEW

Avaliação da efetividade da intervenção com material educativo em pacientes cirúrgicos: revisão integrativa da literatura

La evaluación de la efectividad de la intervención con material educacional en pacientes quirúrgicos: una revisión integradora de la literatura

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ABSTRACT: Objectives: To analyze the scientific literature on methods used in the evaluation of the effectiveness of printed educational materials designed for patients undergoing surgery. **Method:** This is an integrative literature review based on the following guiding question: "What methods are used to evaluate the effectiveness of printed educational materials in the education of surgical patients?" We considered studies published between 2000 and 2017 that appeared in ISI Web of Science, Virtual Health Library (VHL), PubMed, SCOPUS portals and/or databases and Cochrane. **Results:** We included 10 randomized clinical trials, all with printed educational materials (booklets). The studies revealed that the use of booklets contributed to a reduction not only in anxiety and depression levels, but also pain. **Conclusion:** Despite positive assessments regarding the intervention, there are still difficulties in measuring its effectiveness. Therefore, the best moment for the application of the assessment tool could not be established.
Keywords: Clinical trial. Booklets. Perioperative nursing. Health education.

RESUMO: Objetivo: Analisar a literatura científica produzida sobre métodos utilizados na avaliação da efetividade de tecnologias educativas impressas para o paciente submetido a cirurgia. **Método:** Revisão integrativa da literatura, tendo como questão norteadora "quais os métodos utilizados para avaliar a efetividade de tecnologias educativas impressas na educação do paciente cirúrgico?". O período de publicação dos estudos foi de 2000 a 2017, nos de dados: ISI *Web of Science*, Biblioteca Virtual em Saúde (BVS), *PubMed*, SCOPUS portais e/ou bases e *Cochrane*. **Resultados:** Foram inseridos dez artigos de ensaios clínicos randomizados, todos com a tecnologia educativa impressa (folheto), e o uso dessa contribuiu para uma diminuição tanto da ansiedade e depressão quanto dos níveis da dor. **Conclusão:** Apesar de avaliações positivas em relação à intervenção, ainda há dificuldades em mensurar a sua efetividade, e não foi possível estabelecer o melhor instante para a aplicação dos instrumentos de medida.
Palavras-chave: Ensaio clínico. Folhetos. Enfermagem perioperatória. Educação em saúde.

RESUMEN: Objetivos: Analizar la literatura científica sobre los métodos utilizados en la evaluación de la efectividad de materiales educativos impresos creados para pacientes sometidos a cirurgía. **Método:** Esta es una revisión integradora de la literatura basada en la siguiente pregunta: "¿Cuáles son los métodos utilizados para evaluar la efectividad de los materiales educativos impresos en la educación de pacientes quirúrgicos?" Consideramos estudios publicados entre 2000 y 2007 encontrados en los portales y/o bases de datos de *ISI Web Science, Virtual Health Library* (VHL), PubMed, SCOPUS y Cochrane. **Resultados:** Se incluyeron 10 ensayos clínicos aleatorizados, todos con materiales educativos impresos (*booklets*). Los estudios revelaron que el uso de *booklets* contribuyó a una reducción no solo en los niveles de ansiedad y depresión, sino también en el dolor. **Conclusión:** Apesar de las evaluaciones positivas con respecto a la intervención, todavía aún hay dificultades para medir su efectividad. Por lo tanto, el mejor momento para conducir la herramienta de evaluación no pudo se establecer.
Palabras clave: Ensayo clínico. Folletos. Enfermería perioperatória. Educación en salud.

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INTRODUCTION

Health professionals seek to work on the treatment, control, rehabilitation and prevention of diseases and injuries. In order to do so, they often make use of educational strategies to guide the population, which makes them important agents in health education.[1]

The World Health Organization (WHO) defines patient education as any combination of learning experiences designed to help individuals and communities to improve their health, by increasing their knowledge or influencing their attitudes.[2]

Health education allows the integration of scientific and common-sense knowledge and aims at health promotion and the direct approximation between professionals and users in the search for a relationship that leads to coparticipation.[3]

Poor knowledge about a given disease process can compromise the effectiveness of the treatment, since misinformation and health anxiety contribute negatively to the health-disease process. Patients with more knowledge are less anxious and more cooperative, contributing with the effectiveness of the treatment.[4]

The WHO suggests some health educational practices, such as the organization of educational workshops and training sessions for patients and families, encouraging the use of technologies to complement the instructions provided. These measures could improve access to information and support health self-management.[5]

Pedagogical strategies such as the use of brochures and booklets allow a further analysis of the material, reaffirming the information that was transmitted orally by the health professional, serving as a support for the instructions received, helping patients make better decisions. To meet the proposed objectives, these tools must be appealing to the target audience, with appropriate, understandable and easy-to-read vocabulary.[6]

Among the different scenarios in which the use of educational technologies is present, we highlight perioperative care. Patients submitted to a surgical intervention may have their psychological and physiological needs altered, which contributes to a physical/emotional imbalance.[7]

The knowledge patients have about their surgical procedures is usually transmitted by surgeons or obtained from experiences shared by neighbors or friends. Nowadays, it is common to look for information about health online. Patients may learn from experiences shared in blogs or virtual communities, and even get information about the procedure they are about to undergo in specific sites. However, given the intrinsic characteristics of each person, the content may lead to increasing anxiety experienced during the preoperative period.[4,7]

The patients' education takes place by developing skills that can favor surgical rehabilitation. The use of educational and/or informative materials should be related with this teaching strategy. However, health science institutions hardly ever describe methods used to produce these materials, which could contribute with results.[8]

Different strategies are applied as resources to help the development of the individual. In a review study on applied educational technologies, the authors reported that the transmission of information is essential to minimize doubts or to modify risk behavior.[9] Thus, the objective of educational materials should be to facilitate the work of the health team in communicating and guiding patients and family members.

It is clear that the use of educational technologies to teach perioperative patients is essential. However, there is no standardized methodology that can be applied to the production and/or validation of such materials, nor methods to measure the effectiveness of interventions that employ these strategies.[8] Thus, we decided to carry out a search in the literature to analyze the evaluation methods for interventions that apply educational technologies.

OBJECTIVE:

To analyze the scientific literature produced on methods used for the evaluation of the effectiveness of printed educational materials for the delivery of health care information to patients referred for surgery.

METHOD

We performed an integrative review of the scientific literature, which is considered the broadest modality of review research since it allows the simultaneous inclusion of experimental and non-experimental studies, and theoretical or empirical questions. As a result, it provides better understanding of a phenomenon or health problem.[10]

The stages of this integrative review were to:

1. to identify the theme and choose the hypothesis or research question to compose the integrative review;

2. to consolidate inclusion and exclusion criteria of studies/samples or search in the literature;
3. to determine the information to be collected from the selected studies;
4. to categorize and evaluate studies included in the integrative review;
5. to interpret results; and
6. to present a synthesis/revision of knowledge.[11]

The delimitation of a study using a research question leads the researcher to resort to the rigorous and standardized verification process of the literature. This technique should guide the analysis and discussion of the scientific production in a specific field, in order to promote deeper knowledge about the fact under study.[12]

Our search was guided by the following question: What methods are used to evaluate the effectiveness of printed educational materials in the education of surgical patients?

Database searching and selection of studies

The search included articles published from 2000 to 2017. The inclusion criteria were:

- articles published in Portuguese, English, French, Italian or Spanish;
- full articles describing the methods used to evaluate the effectiveness of a given educational material;
- brochures and/or booklets used for patient education; and
- being a case-control, clinical trial, pilot-test or follow-up study.

Exclusion criteria were:

- information to patients imparted only by oral communication, videos or other digital means;
- absence of pre/post evaluation of the use of educational technology; and
- theoretical studies.

Effectiveness studies examine interventions in realistic circumstances that come close to the real-world clinical setting, such as analyses with more heterogeneous patients, less standardized protocols and delivery of materials in a routine clinical setting. In randomized clinical trials, intervention is more frequent in comparison to routine care.[13]

In general, effectiveness studies use statistical analyses to measure the effectiveness.[13] However, according to the American Institute of Medicine, comparative effectiveness research has been defined as "the generation and synthesis of evidence that compares the benefits and harm of alternative methods to prevent, diagnose, treat and monitor a clinical condition or to improve the delivery of care.[14]

In this review, we chose to select only studies that report the application of printed educational materials because it is the line of research that underlies the scientific initiation project entitled "Evaluation of an educational technology in perioperative orthognathic education: a randomized clinical trial."

Articles were selected from the following portals and/or databases: ISI Web of Science, Virtual Health Library (VHL), PubMed, SCOPUS and Cochrane. The search was conducted in July 2017.

We selected descriptors from *Descritores em Ciências da Saúde* – DeCS (Health Science Descriptors) and from Medical Subject Headings Section (MESH) and two uncontrolled descriptors, establishing the following search parameters: (surgery) AND (patient education OR health education) AND (education material OR education intervention OR written education material OR booklet OR handout).

Data collection

First, we analyzed titles and abstracts from national and international scientific publications to identify studies that met the inclusion criteria. Then, selected articles were read in full for data analysis.

The data collection of the articles included in the integrative review was carried out using an instrument containing the identification of the original article and methodological characteristics of the study (objective, type of study, population studied, intervention characteristics, data analysis and results).

Data analysis

To synthetize our findings, we used a synoptic table with the following aspects: study, database, article title, author, journal, objective, type of study and conclusion.

The methodological quality was evaluated by the CONSORT[15] guideline and by the Jadad scale[16] (which assigns scores 0-5 to studies).

We provided a descriptive presentation of the results to allow the reader to evaluate the applicability of the elaborated integrative review and to provide subsidies both for

the decision making in health education practices and for the identification of knowledge gaps — which may also be useful for future research.

RESULTS

We obtained 504 articles from the 5 databases included in our study. Of these, 86 were excluded because they were repeated, totaling 418 articles. After reading the abstracts, we observed that 379 publications did not meet the established inclusion criteria, accounting for 39 remaining studies. Given the quantity, we chose to consider only randomized clinical trials for the present study.

Thus, at the end of this analytic process, we selected 10 papers to compose the present review (Figure 1).

All studies were published in English; 3 of them were carried out in Canada[17-19] and the others were conducted in China,[20] Finland,[21] Serbia,[22] Greece,[23] Italy,[24] Germany,[25] and in the United States.[26]

Table 1 shows a summary of publications containing author, type of study, sample, intervention, measurement instruments and results.

Type of studies

All studies were randomized clinical trials. The 10 studies included met an average of 81% (variation from 56.7-92%)

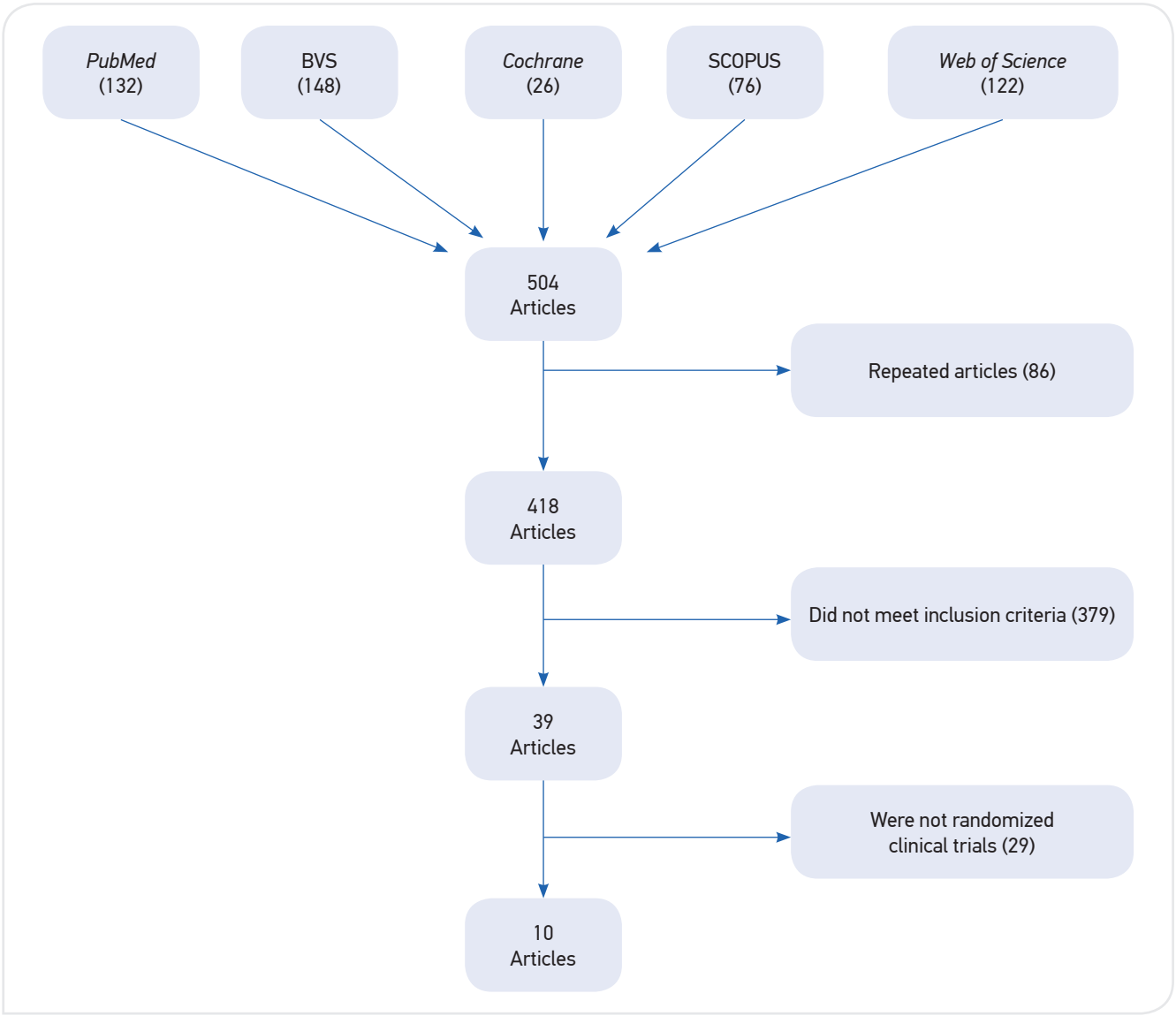

Figure 1. Operational flowchart.

Table 1. Summary table of the studies analyzed, 2000-2017.

Authors	Sample	Intervention	Assessment tools	Results
Watt-Watson et al., 2000[17]	N = 45 IG1 = 13 IG2 = 16 CG = 16	CG: routine practice with booklet and video IG1: additional booklet "Pain relief after surgery" for reading before the surgical procedure IG2: additional booklet "Pain relief after surgery" for reading before the surgical procedure + reinforcement of instructions and clarification of doubts	McGill Pain Questionnaire – short form Present Pain Intensity e Category Numeric Scale Patient Outcome Questionnaire Brief Pain Inventory Barriers Questionnaire	IG > CG for pain related to the activity IG = CG for pain frequency
Watt-Watson et al., 2004[18]	N = 406 IG = 202 CG = 206 (16 losses)	CG: routine pre-operative education with booklet and video IG: included additional booklet "Pain relief after surgery" for reading before the surgical procedure	Patient Outcome Questionnaire Brief Pain Inventory McGill Pain Questionnaire Category Numeric Scale Barriers Questionnaire	IG > CG* To pain in the 5th postoperative phase
Martorella et al., 2012[19]	N = 60 IG = 30 CG = 30 (6 losses)	CG: booklets IG: booklet + guidance by virtual nurse via web	Hospital Anxiety and Depression Scale (HADS) Brief Pain Inventory Barriers Questionnaire Pain Catastrophizing Scale	IG < CG* inference from pain to cough/ breath IG < CG* less pain barriers
Guo et al., 2011[20]	N = 153 IG = 76 CG = 77 (18 losses)	CG: routine preoperative care GI: educational material "Your heart surgery" + verbal guidance	Hospital Anxiety and Depression Scale (HADS) Brief Pain Inventory – short form Length of stay in the Intensive Care Unit Postoperative hospital stay	IG > CG* anxiety IG > CG* depression IG = CG pain IG = CG Length of stay
Johansson et al., 2010[21]	N = 59 IG = 30 CG = 29	CG: educational material IG: educational material + education via telephone	Orthopaedic Patient Knowledge Questionnaire Modified Empowerment Questionnaire Length of hospital stay Complications	IG < CG* knowledge IG > CG* empowerment
Vukomanović et al., 2008[22]	N = 45 IG = 23 CG = 22 (9 losses)	CG: without preoperative education IG: verbal instruction for patient education + booklet	Visual Analog Pain Scale (VAS) Goniometric Harris Hip Score Hip Score of the Japanese Orthopaedic Association (JOA) Oxford Hip Score	IG > CG* for some functional activities of the patient related to the movement
Kadda et al., 2016[23]	N = 500 IG = 250 CG = 250	CG: routine preoperative care IG: verbal instruction for patient education + educational material	Medical history Food frequency questionnaire Physical activity questionnaire Center of Epidemiological Studies-Depression (CES-D)	IG < CG* risk of nonfatal cardiovascular disease
Piredda et al.,2016[24]	N = 105 IG1 = 34 IG2 = 34 CG = 37	CG: routine preoperative care IG1: pre-operative educational material IG2: verbal education for patient education + educational material	Fully implanted catheter knowledge questionnaire Information needs questionnaire and source of preference Satisfaction with the educational material Psychological Distress Inventory (PDI)	IG < CG* systolic and diastolic blood pressure IG > CG* knowledge
Schmidt et al., 2015[25]	N = 652 IG = 326 CG = 326 (99 losses)	CG: routine preoperative care IG: educational material and diary keeping in the preoperative care + verbal education	European Organization for Research and Treatment of Cancer 30-Item Core Quality of Life Questionnaire, version 3.0 (EORTC QLQ-C30) Physiological and Operative Severity Scoring System for enUmeration of Mortality and morbidity (POSSUM) Medical history Pre-operative Assessment of Cancer in the Elderly (PACE) Mini-Mental State Examination (MMSE) Confusion Assessment Method for Intensive Care Units (CAM-ICU) Nursing Delirium Scale (NUDESC) Length of hospital stay	IG = CG length of stay IG = CG quality of life IG = CG postoperative dementia IG = CG mortality IG < CG* pain in the first postoperative period
Louw et al., 2014[26]	N = 67 IG = 32 CG = 35 (4 losses)	CG: routine preoperative care IG: educational material + verbal education	Numerical pain scale Oswestry Disability Index (ODI) Patient's satisfaction Fear avoidance – work scale Fear avoidance – physical activity subscale Pain catastrophization scale	IG = CG pain, fear and inability due to low back pain

IG: intervention group; CG: control group; *statistically significant ($p < 0.05$).

of the CONSORT assessment items that suggest quality of the clinical trial. Randomization was performed using numbered tables[17-18]; envelopes containing information for each group,[19,21,26] block randomization[20,25] and binary sequence created in a computer.[23,24] One study did not describe the randomization method.[22]

In two Canadian studies,[17-18] blinding was imposed on the researcher's assistant. However, in the Finnish[21] and in the American[26] studies, the researchers were blinded.

In another Canadian study,[19] researchers used the double-blind procedure.

Methodological quality assessment

Of the studies evaluated by the Jadad scale, 70% showed low quality index[17,18,20,22-25] (score 0-2 points) and only three[19,21,26] obtained high quality index (score of 4-5 points).

Participants

Participants varied in relation to their characteristics and sample size in each study. The mean age, when informed[17-26], was 54.8 years (50-72). Regarding gender, both sexes were analyzed.[17-26] In relation to schooling, all studies assessed literate individuals.[17-26]

The procedures to which the patients were submitted included cardiac surgeries (revascularization,[17-19,23] valve replacement,[23] partial sternotomy for congenital defects[20]), hip arthroplasty,[21,22] fully implantable venous catheter implant,[24] gastric, thoracic and genitourinary cancers[25] and lumbar radiculotomy.[26]

Sample size

Regarding sample size, the studies had 45-652 participants, half of them with variation from 45-67 individuals.[17,19,21,22,26] Sample sizes of intervention groups in clinical trials ranged from 13-326 people. Control groups, in turn, ranged from 16-326 individuals. All groups had some degree of homogeneity considering the characteristics of the participants, such as *before the intervention in sociodemographic variables*,[18-22,24] *morbidity or signs and symptoms*,[18,20,24] *knowledge about the surgery*,[21] heterogeneity in the preoperative evaluation by the Hospital Anxiety and Depression Scale (HADS)[20] on the Oxford hip score.[22] One study did not provide information on the homogeneity of the group.

Interventions

All the interventions described in the studies (100%, n = 10) used printed material (booklets) with information about surgical procedures and how the patient should behave postoperatively, as well as a complementation through verbal guidance.[17- 26] In one publication, the verbal guidance was performed by telephone.[21] Another study described the development of a web-based nursing intervention to educate patients.[19] Some other studies used additional intervention methods: in 2 of them (20%), in addition to booklets (with content related to surgical procedures), instructional videos were shown, reaffirming the steps of the procedures and the actions required in the postoperative period.[17,18] In one study (10%), the educational booklet was followed by a preoperative web-based session.[19]

Assessment tools

All studies used at least one pain and/or anxiety assessment tool; two of them (20%) applied the researcher's idea to measure the quality of educational intervention on the postoperative effects;[21] one (10%) measured the distress in parallel with alteration of vital signs and also designed a booklet with answers for clarification questions for the satisfaction of the material.[24]

Considering the questionnaires used to evaluate the effectiveness of the intervention in pain management, 4 studies (40%) chose verbal numerical rating scales and/or analogue verbal rating scales;[17,18,22,26] 3 studies (30%) used the Barriers Questionnaire, which evaluates the patients' concern about reporting pain and using painkillers;[17-19] 4 studies (40%) used the Brief Pain Inventory to analyze the impact of pain on activities of daily living[18-20] – of them, only one used the Brief Pain Inventory (short form);[20] 2 studies (20%) used the McGill Pain Questionnaire – (short form);[17,18] 1 study (10%) used the Present Pain Intensity scale, which measures current pain intensity;[17] 2 studies (20%) used the Patient Outcome Questionnaire to verify pain in activities;[17,18] and 2 studies (20%) used the Pain Catastrophizing Scale, which assesses the tendency to magnify the threat value of pain stimulus.[19,26] One orthopedic study (10%)[22] used the Oxford Hip Score to analyze pain and hip function.

Two studies (20%) measured the patient's concern and satisfaction with the educational intervention;[21,22] and in 1, the need for information and preferences of the individual was evaluated.[24]

The Harris Hip Score scale developed for the assessment of the results of arthroplasty and the Japanese Orthopedic Association (JOA) Hip Score were applied to assess articulated hip disease.[22]

Two studies (20%) used the Hospital Anxiety and Depression Scale (HADS) to assess preoperative anxiety of patients.[19,20] The Psychological Distress Inventory (PDI) was used in one publication (10%).[24]

One of the articles[25] used six varied tools to assess different variables: quality of life with the European Organization for Research and Treatment of Cancer 30-Item Core Quality of Life Questionnaire, version 3.0 – EORTC QLQ-C30; disease severity with the physiological and operative severity score for the enumeration of mortality and morbidity scoring systems – POSSUM; preoperative assessment of the older surgical patient; mental examination with the Mini-Mental State Examination – MMSE; and delirium with the Confusion Assessment Method for Intensive Care Units – CAM-ICU / Nursing Delirium Scale – NUDESC.

The authors also designed specific questionnaires to evaluate signs and symptoms in the postoperative period,[20] patient's knowledge about the content of the video,[18] about the educational material,[24] assessment of vital signs,[24] assessment of dietary intake and physical activity,[23] assessment of hospital length of stay in the Intensive Care Unit (ICU)[20] and length of hospital stay.[20-21,25]

In one of the studies, participants received 20 dollars for each time the questionnaires were completed (1, 3, 6 and 12 months).[26]

Intervention moment before and after

The authors used the tools to assess educational intervention at different times. Six studies (60%) reported the application before the surgical procedure with variation of 15-24 hours.[20,21,25,26] The other 4 studies (40%) did so on the day of the educational intervention (Figure 2).[19,22-24]

Regarding the assessment of the intervention in the postoperative period, 4 studies (40%) repeated measures on the first day after surgery,[18,19,22,24], 4 (40%), on the third day[17-19,22], and 3 (30 %) in at least two postoperative moments (1st-7th PO variation).[17-19]. The days after surgery in which the tools were applied varied from 1 day to 15 months after the surgical procedure (Figure 3); Two publications assessed up to 1 year postoperatively.[25,26]

Statistical analysis

All the studies evaluated the intervention using one of the following statistical tests: chi-square, Mann-Whitney, Student-t, ANOVA, ANCOVA, Pearson, Fisher's exact and Tukey's HSD or multiple logistic regression, according to the normality of the data.

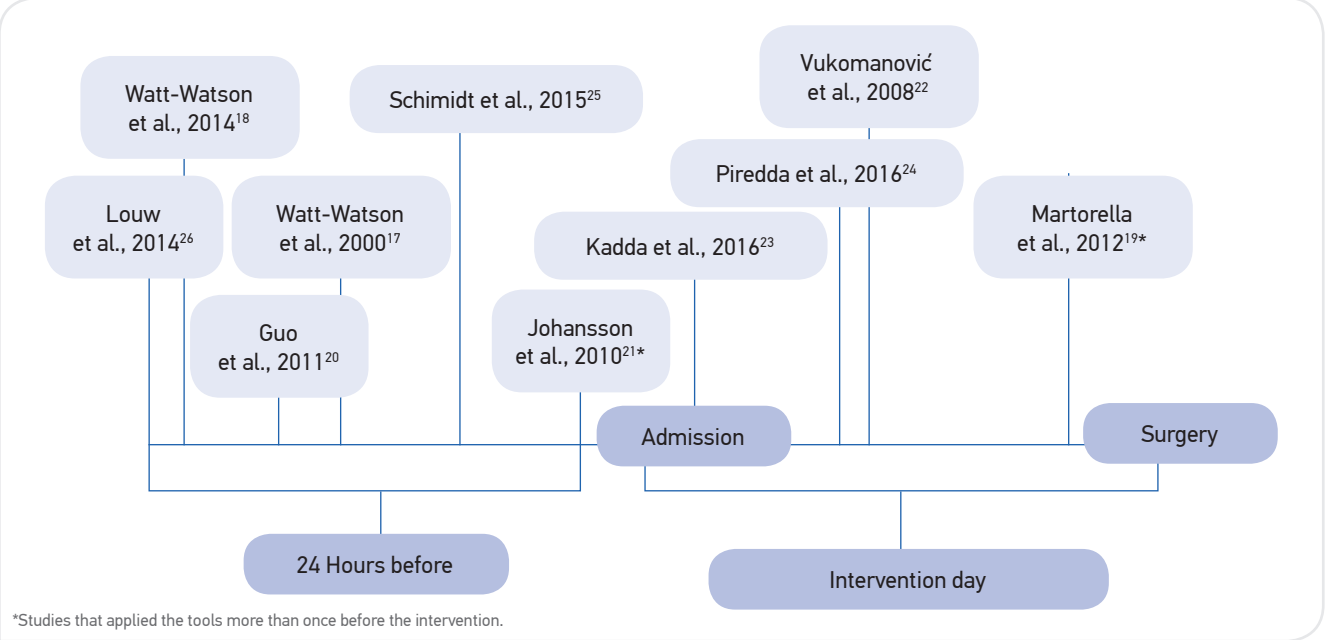

Figure 2. Distribution of studies according to the moment of application of the assessment tools.

DISCUSSION

Although we found many articles in our search, only a few met the inclusion criteria. We observed that studies approaching printed materials for patient education were carried out mainly in Canada. Among the objectives proposed by the articles under study, the most frequent was pain control, followed by the patient's anxiety control.

Five studies reported a reduction in pain level in their results.[17-19,22,25] However, half of them showed no statistically significant differences in the comparison between intervention and control groups. One of the articles[17] reported a significant difference between the groups in the evaluation of postoperative scores: the control group had higher pain scores than the intervention group.

A secondary study[27] – that aimed to evaluate whether preoperative teaching strategies used in orthopedic surgery could positively affect postoperative pain – revealed that of the 13 articles assessed, only one was effective.

In the present review, of the two studies that addressed the control of anxiety and depression before the surgical procedure,[19,20] only one showed a reduction in depression levels in the intervention group in comparison to the control group.[20] The other study showed no statistically significant differences between the groups.[19] The study that assessed postoperative stress revealed no statistical difference.[25]

Another publication[28] assessed factors responsible for the reduction of preoperative anxiety in patients undergoing breast and abdominal surgeries in a tertiary hospital. Based on the hypothesis that patients with more knowledge of their pre- and post-surgical care would have less pre- and postoperative anxiety, the authors concluded that the greater the contact with the team and researchers, the lower the levels of anxiety. They also concluded that communication strategies – along with the ability to anticipate information regarding the procedure and care for patients in the intra- and postoperative periods – were factors that contributed with an effective anxiety reduction.

In a non-randomized pilot study, trait anxiety levels decreased after the intervention, showing that it was consistent despite the need to confirm its effectiveness with the control group.[29]

One of the publications[20] revealed a statistically significant difference in length of hospital stay, in which the intervention group reported a shorter period spent in the ICU than

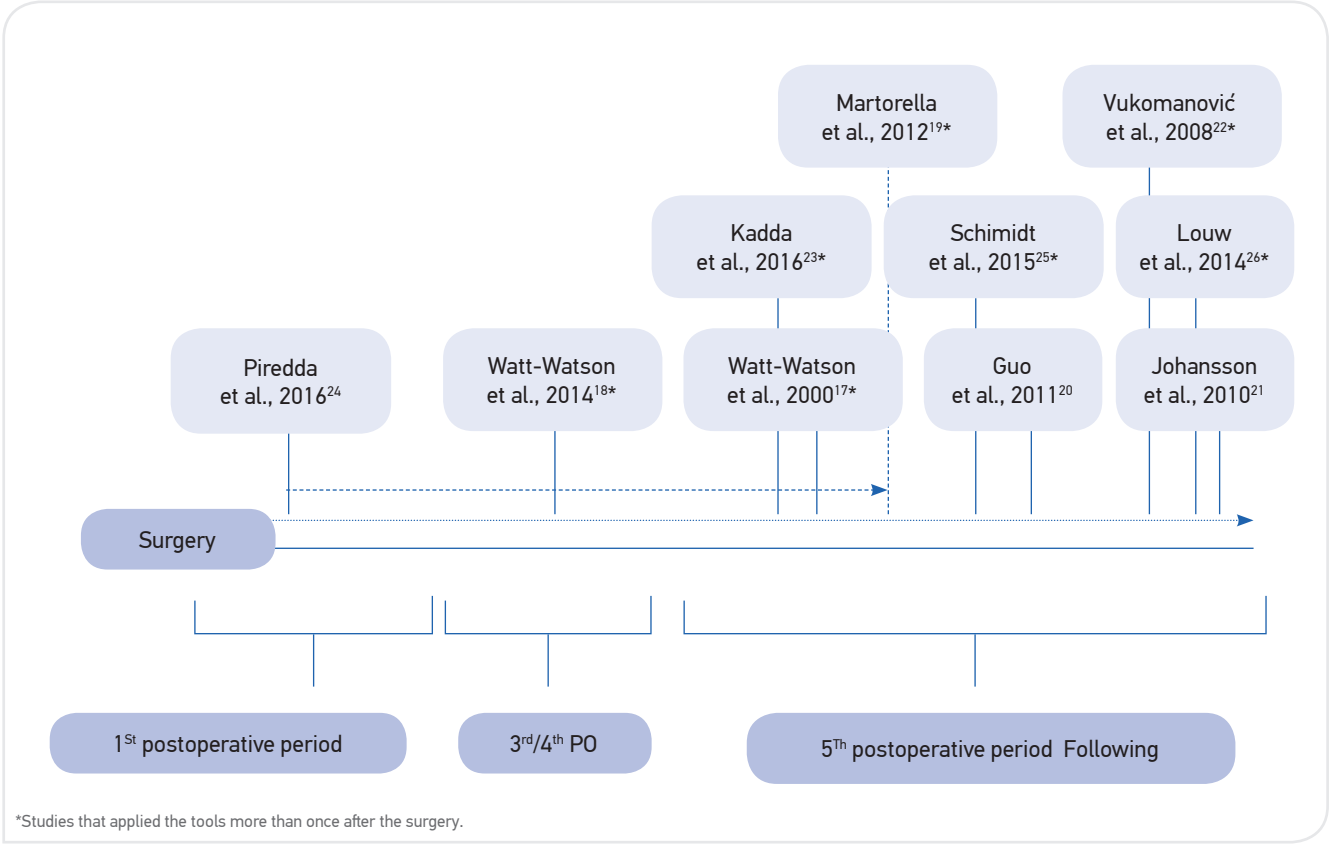

Figure 3. Distribution of studies according to the moment of application of post-intervention assessment tools.

the control group. In another study,[25] the length of hospital stay showed no difference between the groups.

All studies addressed in this review used printed educational materials (booklet/pamphlets) as a form of intervention. Of the ten articles examined, only two did not detail the information contained in the booklets.[21,22] Six presented information regarding the surgical procedure to which the patient would be submitted, as well as postoperative instructions.[17,18,20,21,25,26] One booklet conveyed information and/or instructions on postoperative pain control and management.[19] One shared instructions on postoperative rehabilitation.[23] Five studies validated the information contained in their materials through a consensus of experts.[18-20,23,26].

An article evaluating the quality and suitability of 59 examples of written educational material found that the educational tools had partial deficiencies and proposed that, in order to be effective, the materials should offer — in addition to quality information — attractive and reliable content, shape and design. The authors also proposed that the text should be simple and understandable to facilitate learning.[30]

Regarding sample size, the variation in the number of participants in each group was high. Of the studies analyzed, five reported having an effect size calculation, an important measure that confers internal validity to the study and should be a requirement for approval in protocols and research.[31] One of the Canadian studies revealed a moderate effect size (20%), which was considered clinically significant (although there was no data that would serve to determine a clinically significant change in pain).[18] The Finnish study[21] showed that the effect of the sample size was high enough and that it was representative of the patients with the studied pathology.

Regarding the limitations of this study, we can highlight that, despite the high number of articles found in the first stages of the review, only a few met the inclusion criteria. We observed a concentration of articles approaching cardiac surgeries and a poor description of the validation process of the educational materials used before the intervention. Another factor that contributed negatively to the effectiveness analysis of the interventions was the variety of moments in which the assessment tools were applied, both before and after the surgery.

CONCLUSION

Despite the positive evaluations of the intervention with the use of educational materials by surgical patients, it is still difficult to measure their effectiveness through the tools used by researchers. It was not possible to establish the best time for its application before and after the surgical procedure, given the variability in the methods.

Patient education using written educational materials has contributed to the reduction of anxiety, depression pain levels. For an efficient intervention, material should be easily accessible, written in language that is appropriate for the target audience and allow consultation during the perioperative stages. Informing about the technique and the procedure to which the patient will be submitted contributes significantly to a better recovery.

We hope that the present study may stimulate the elaboration of protocols that standardize the moments of application of assessment and intervention tools. Such standardization would facilitate the comparison of studies reporting the results of the effects of the use of educational materials on the reduction of signs and symptoms of patients in the perioperative period.

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