Global Academic Nursing Journal

ORIGINAL ARTICLE

Bundle to prevent complications of nasoenteral catheterization in an intensive care unit

Paquete para prevenir las complicaciones del cateterismo nasoenteral en una unidad de cuidados intensivos

Bundle de prevenção das complicações da sondagem nasoenteral em unidade de terapia intensiva

Maria Ligia dos Reis Bellaguarda[1]
ORCID: 0000-0001-9998-3040
Isolete Maria Schuller Vieira[2]
ORCID: 0000-0001-6837-3418
Joice Helena Petri[3]
ORCID: 0000-0002-3265-6923
Rosemeri Coelho[4]
ORCID: 0000-0003-1883-8280
Cladis Loren Kiefer Moraes[5]
ORCID: 0000-0003-4579-3588

[1]Universidade Federal de Santa Catarina. Santa Catarina, Brazil.
[2]Secretaria de Saúde do Estado de Santa Catarina. Santa Catarina, Brazil.
[3]Hospital Regional Helmuth Nass. Santa Catarina, Brazil.
[4]Hospital de Caridade Senhor Bom Jesus dos Passos. Santa Catarina, Brazil.
[5]Faculdade de Santa Catarina. Santa Catarina, Brazil.

How to cite this article:
Bellaguarda MLR, Vieira IMS, Petri JH, Coelho R, Moraes CLK. Bundle to prevent complications of nasoenteral catheterization in an intensive care unit. Glob Acad Nurs. 2020;1(2):e18. https://dx.doi.org/10.5935/2675-5602.20200018

Corresponding author:
Cladis Loren Kiefer Moraes
E-mail: cladismoraes@uol.com.br

Submission: 09-02-2020
Approval: 09-07-2020

Abstract

Objective: To build a bundle to prevent complications associated with nasoenteral catheterization in an Intensive Care Unit. Method: Qualitative study in the exploratory descriptive modality between May and June 2015. The participants were 13 professional nurses and a speech therapist. Data collection was carried out in three stages, applying a checklist to the medical record observation of procedures in the passage and handling of the nasoenteral probe and discussion of groups for the construction of the Care Bundle. The analysis consisted of associations and variations of information and discussed in the professional group and definition of the Bundle, analyzed in the light of the criteria of evidence-based practice. Results: The evidence emerged two categories: Arguments for the prevention of complications in enteral therapy and, Bundle of care for complications of enteral therapy in an intensive care unit. They bring the justifications and implications of each evidence and the collectively constructed Care Bundle. Conclusion: Good practices are increasingly evolving towards the qualification of health work and patient safety. The study reiterates the sharing of care actions and through individualized care and within approved protocol processes based on evidence.

Descriptors: Nursing; Enteral Feeding Probes; Patient Care Package.

Resumén

Objetivo: Construir un paquete para prevenir complicaciones asociadas al cateterismo nasoenteral en una Unidad de Cuidados Intensivos. Método: Estudio cualitativo en la modalidad exploratoria descriptiva entre mayo y junio de 2015. Los participantes fueron 13 enfermeros profesionales y un logopeda. La recolección de datos se realizó en tres etapas, aplicando una lista de verificación a la historia clínica; observación de procedimientos en el paso y manejo de la sonda nasoenteral y discusión de grupos para la construcción del Care Bundle. El análisis consistió en asociaciones y variaciones de información y discutidas en el grupo profesional y definición del Bundle, analizadas a la luz de los criterios de la práctica basada en la evidencia. Resultados: De la evidencia surgieron dos categorías: Argumentos a favor de la prevención de complicaciones en la terapia enteral y Paquete de cuidados para las complicaciones de la terapia enteral en una unidad de cuidados intensivos. Traen las justificaciones e implicaciones de cada evidencia y el Care Bundle construido colectivamente. Conclusión: Las buenas prácticas evolucionan cada vez más hacia la cualificación del trabajo sanitario y la seguridad del paciente. El estudio reitera la puesta en común de acciones asistenciales y a través de la atención individualizada y dentro de procesos protocolarios aprobados basados en evidencia.

Descriptores: Enfermería; Sondas de Alimentación Enteral; Paquete de Atención al Paciente.

Resumo

Objetivo: Construir *Bundle* de prevenção de complicação associada à sondagem nasoenteral em uma Unidade de Terapia Intensiva. Método: Estudo qualitativo na modalidade exploratória descritiva entre maio e junho de 2015. Os participantes foram 13 profissionais enfermeiras e uma fonoaudióloga. A coleta de dados foi realizada em três etapas, aplicação de *checklist* ao prontuário; observação de procedimentos na passagem e manuseio da sondagem nasoenteral e discussão de grupos para a construção do *Bundle* de cuidados. A análise foi constituída pelas associações e variações das informações e discutidas no grupo profissional e definição do *Bundle*, analisados à luz dos critérios da prática baseada em evidências. Resultados: As evidências fizeram emergir duas categorias: Argumentos para a prevenção de complicações em terapia enteral e, *Bundle* de cuidados de complicações da terapia enteral em unidade de terapia intensiva. Trazem as justificativas e implicações de cada evidência e o *Bundle* de cuidados construído coletivamente. Conclusão: As boas práticas vêm cada vez mais evoluindo para a qualificação do trabalho em saúde e da segurança do paciente. O estudo reitera o compartilhamento de ações de cuidado e por meio de cuidados individualizados e dentro de processos protocolares aprovados fundamentados em evidências.

Descritores: Enfermagem; Sondas de Alimentação Enteral; Pacote de Assistência ao Paciente.

Introduction

With precept in the art of nursing care, it is a fundamental part in the prevention, treatment, and recovery of diseases to the patient. The provision of integrated, qualitative, and humanized care is necessary, including the need for nutrition. However, some illnesses make it impossible for men to meet these needs. The option of Nutritional Therapy (NT) is indicated to patients, who for some reason, cannot reach their nutritional need by conventional oral route, being a set of therapeutic procedures for maintaining and recovering the nutritional status of patients, through controlled intake of nutrients by enteral route, aiming at offering adequate proteins, energy, minerals, vitamins and water[1].

The inability to supply necessary nutrients to meet body requirements is a serious concern in hospitalized patients, especially people with traumatic injuries, the elderly, chronic illnesses, and patients admitted to the ICU, who are especially vulnerable to complications resulting from malnutrition, as they can present hemodynamic instability, limitation of water intake, and decreased absorption of drugs and nutrients. In addition to these factors, the ineffective monitoring and little attention of professionals in nutritional assessment in relation to the acceptance of the diet can contribute to changes in nutritional status. Malnutrition results from inadequate nutritional supply. Malnutrition is a possibility that must be considered in hospitalized patients, as it can occur very frequently, due to changes in metabolism due to the treatment they need or the disease itself, especially in the ICU, where these patients are usually dependent. of mechanical ventilation and the rate of infection is high, in addition to some having changes in the intestinal mucosa and changes in the microbiota, a condition that is a predictor of high rates of morbidity and mortality[2,3].

The nasoenteral tube can be positioned in the stomach, duodenum or jejunum, the choice of route should be based on the time predicted for NET and on the patients' nutritional needs, according to their clinical condition. Considering that each route requires specific care, as well as an indication for its positioning[4,5].

When well indicated and adequate to the patient's nutritional needs, TN helps to reduce morbidity and mortality, as it allows the reestablishment of the nutritional profile, as well as meeting the specific nutritional needs. However, the lack of skill and knowledge in its management can cause complications and risks for patients. The most commonly found in practice are: diarrhea, nausea, vomiting, gas, gastric fullness, colic, dumping syndrome, increased gastric waste, aspiration pneumonia, poor placement, tube obstruction, nasopharyngeal irritation, hyperglycemia, dehydration, constipation, nasal injury , sinusitis, and hydroelectrolytic imbalance[6]. Frequently, patients in the ICU use vasoactive drugs, antibiotics, sedatives, analgesics and prokinetic drugs that have widespread drug effects, especially in the central nervous and gastrointestinal systems. One of the first signs is gastric hypomotility, because of delayed gastric emptying, decreased hydro-air noises, which may promote signs of abdominal discomfort and distension, nausea and vomiting[7].

Considering the safe need for assistance to ICU patients, nurses, in addition to the use of protocols, have appropriated strategies based on clinical evidence, have appropriated a tool with the objective of improving the processes and results of care for the patient. care packages or bundles. These in turn are a set of practices that, when performed collectively and reliably, improve the results for patients[8].

However, the applicability of a Bundle in healthcare practice is a challenge and to achieve success. Studies suggest that these are dynamic and implemented in conjunction with the work team, so that there is motivation for all involved, allowing the continuous assessment of the assistance provided and the creation of clear therapeutic goals[9]. Based on these considerations, the following research problem was defined: What nursing care is relevant to reduce the complications of nasoenteral catheterization to patients in the Intensive Care Unit? Thus, this study aims to build a bundle to prevent complications associated with nasoenteral catheterization in an Intensive Care Unit.

Methodology

This is a qualitative research of the Convergent-Assistance (PCA) type, which features the active participation of the subjects as a characteristic. The research site was the Adult Intensive Care Unit (ICU) of a medium-sized University Hospital in southern Brazil. The ICU of the hospital under study has 20 beds, distributed in two areas called area "A" and area "B", each with 10 beds. It is classified into general, clinical and surgical care in the highly complex care of seriously ill patients in the areas of Internal Medicine, General Surgery, Digestive System Surgery, Vascular Surgery, Onco-hematology, Neurosurgery (epilepsy surgery), Nephrology, Urology , Gynecology and Obstetrics.

Study initiated from Opinion No. 1,044,881, of April 28, 2015, approved by the Research Ethics Committee of the institution of origin of the authors and of the Hospital Institution under study. Following the stages of presentation of the project to the ICU professionals, study space, agreement and signature by the professionals, of the Free and Informed Consent Term, discussion groups were scheduled from the dates and times defined according to the availability of the participants and the location was agreed , in the ICU meeting room.

The study subjects were 14 professionals, 13 nurses and 1 speech therapist under the inclusion criteria: Being a Nurse, Speech Therapist and Nutritionist (professional excluded from the research due to the established criteria) who has been active and effective in the sector for at least six months and, on exclusion, retired professionals for vacation and sick leave and those on a fixed-term replacement. The participants were identified by the initial of the professional category followed by a numerical pattern according to the number of professionals observed and the order of observation, (E1, F1), and so on, successively.

Data collection was carried out in three stages: survey of documentary data in medical records, observation of the care actions of professionals in the passage and maintenance of the nasoenteral tube (food / diet and respiratory therapy of patients with nasoenteral tube) these two collection activities followed instruments in the checklist model. The instrument for documentary collection in medical records consisted of information regarding complications and associated factors in nasoenteral catheterization. They referred to data from the demographic and clinical profile: hospital record, age, sex, length of stay, hospitalization unit, comorbidities, mechanical ventilation, and drug therapy. Data on enteral nutritional therapy: time of NET, access route and infusion method. Data on complications and the most prevalent associated factors: according to type and frequency.

The collection in the medical records took place during a week along with the moments of non-participant observation, of professional care with 19 patients with nasoenteral catheterization. Nineteen data collections were performed in medical records. The authors followed the three shifts, morning, afternoon and night and, with respect to the scale of the professionals to collect the observational data, characterizing the second stage of the collection, presented an average of 4 hours of duration each observation. In the third stage, the groups met according to availability, on the shifts of the professionals involved, in an estimated 35 minutes. Multimedia charts were presented with the results found in documentary and observational sources, from which, each group discussed and listed justification of the activities necessary to compose the Bundle in order of priority and from the evidence and feasibility of carrying out these practices in the context assistance. The principle of data saturation was used to determine the end of data collection.

The methodology followed that described in the Convergent Care Research[10] regarding the organization, treatment, and analysis of data. Attending the stages of apprehension, collection, and careful reading of the data; synthesis, study of the information obtained analyzing the associations and variations of the information and, theorization, where the data were discussed in the professional groups. The last stage of analysis considers the recontextualization in which the priority care emerged, from this study, in the prevention of complications in nasoenteral catheterization and analyzed in the light of the criteria of Evidence-Based Research (EBP). The levels of evidence were classified hierarchically into five items.

Results

During the observation period, 19 patients used Enteral Nutritional Therapy (ENT). The data presented below refer to the first two stages, then the description of the collective discussions.

Regarding the main morbidities of inpatients, seven (36.84%) were surgical, three (15.78%) had sepsis, three (15.78%) had heart disease. The others had pulmonary, hepatic, vascular, neurological and burn pathologies. Most patients were using mechanical ventilation (15; 78.95%).

As for the positioning of the tube, gastric positioning was observed in eleven patients, followed by seven in post-pyloric position and one not registered. Gastric positioning being predominantly used. There is no description of protocols in the unit regarding the fact that the gastric position is more used and its motivation for use. When asked about what would be more beneficial to the patient in relation to the positioning of the probe, they refer to the post-pyloric position as being more beneficial to the patients. Respondents justify that the enteral device because it is more flexible reduces the occurrence of bronchoaspiration, making this placement easier and more practical for insertion of the tube.

It is important to note that positioning requires the purpose of the survey and the criteria for using that positioning. The work shared between Nurse, Nursing Team, Nutritionist, Speech Therapist and Doctor is essential for determining the type, position of the probe, diet, and care to be performed and, evidence-based studies. What interferes with the type of flow to be used according to the type of patient, the comorbidities and whether using mechanical ventilation. Evidence is brought that in the unit under study the continuous flow is the most used. The administration of the diet is performed using an infusion pump and there is no pause period except during nursing and medical procedures. The professional nurses in the discussion groups brought the need or the strategy of the interest in pausing nutrition at night because of the physiological period of non-eating.

Regarding the complications that occurred during NET, of the 19 patients in which, analyzed, four (21.05%) did not present any complications. Thus, the data that will be presented below, refer to the 15 (55.56%) patients, whose complications were identified during the research period. Of these, there was a predominance of metabolic complications in 15 (55.56%), which was evidenced as hyperglycemia, in which the values found vary from 148 to 251mmg / dl. Gastrointestinal complications, such as constipation, vomiting, diarrhea, bloating and nausea, show up in 37.03% of the patients observed. Constipation was present in 05 (33.33%) complications, followed by vomiting 04 (26.67%), and less frequently nausea 01 (06.67%). Some patients had more than one event in gastrointestinal complications.

In addition to the patient-related data, evidence-based prevention practices for nasoenteral catheterization were also observed for the organization of the Bundle. Of this amount, the greatest number of observation opportunities occurred in the morning and night shift and the lowest in the afternoon shift. These observations are related to the times that the probes were manipulated and / or procedures performed with the patient. Complication prevention practices were observed, such as keeping the headboard elevated, such as hand washing (before and after the procedure), washing the tube (before and after medication administration), pausing the diet for medical and / or nursing procedures. From the observations made, it was evident that the elevated headboard was a practice identified with greater prevalence, to the detriment of other

practices. There was no verification of gastric waste because it is not a practice inserted in the rules and routines of the institution.

After conducting the discussion group with professionals based on the data collected, giving participants the opportunity to argue the evidence, the necessary care was collectively built to prevent complications of nasoenteral catheterization based on scientific evidence.

Thus, the care that appeared most frequently in the groups was listed and the order of the nursing care package was organized. Listed the Bundle with five precautions: 1. Headboard raised 30º to 45º; 2. Pause for medical and / or nursing procedures; 3. Verification of gastric residue, 4. Confirmation of positioning and fixation; 5. Washing the probe before and after medication.

Discussion

Serious patients who require assistance in the intensive care unit have comorbidities in addition to the cause that motivated the hospitalization. In this study it was possible to observe a higher frequency of cardiovascular diseases, in addition to surgical patients and sepsis resulting from complications of pre-existing diseases or not, but the causes of ICU admissions are the most diverse. The use of mechanical ventilation (MV) is common in the ICU, which was also observed in this study, requiring enteral therapy as a nutrition option to maintain the patient's caloric and metabolic levels. To maintain mechanical ventilation, patients need analgesia and sedation, and many drugs used for this purpose, such as opioids, impair the motility of the gastrointestinal tract and make it even more difficult to administer and properly absorb nutrients. A recent study showed the caloric and protein inadequacy in patients using MV, demonstrating that the nutritional imbalance can interfere with the caloric needs of the critical patient[3,11].

The conditions that motivate ICU admission are variable and may be related to the vocation of the hospital. In this study, surgery, sepsis, and heart disease predominated. Patients admitted to the intensive care unit regardless of the comorbidity that affects them have a common aggravating factor, which is systemic inflammation. This shows the relevance and urgency to start the patient's nutritional support as early as possible. Major surgeries expose the patient to the condition of nutritional depletion, malnutrition, still most of the time under the use of prolonged ventilatory support and orotracheal intubation, the nutritional failure takes place more quickly[12].

Coronary insufficiency, particularly, which includes circulatory, neurohormonal and metabolic problems, was the most common heart disease during the study period, requiring careful nutritional intervention. According to the metabolic imbalance due to high energy expenditure due to the catabolism generated by heart failure, there is a considerable loss of skeletal muscle mass. Enteral nutrition associated or not with the oral diet can recover the catabolism produced by heart disease. Studies show the importance of early onset of nutrition in sepsis and septic shock, preferably enterally, which is more physiological and safer, preventing bacterial translocation[11,12].

The positioning of the probe is debatable, there is no strong evidence to justify the use of the probe in the post-pyloric position, except in patients who need a prone position for mechanical ventilation, burned patients, patients with severe brain injury and high intracranial pressure. These patients would benefit from using the probe in a post-pyloric position. The gastric position considered the most physiological does not interfere with the energy metabolism hormones, it seems appropriate allowing the digestive and absorptive processes to approach normality and increase the versatility of the diet, if there is no limitation of access, such as gastric outlet obstruction or reflux[4,5,13].

As for the method of continuous or intermittent administration, a study showed that there is no difference in energy metabolism even though the release of most gastrointestinal hormones in the daytime pattern in the presence of diet. Regarding the infusion of the diet, the continuous method in this study predominated. The administration was performed through an infusion pump (BI) in a closed system, being infused in the period of 24 hours without pause. A study has shown that when a nasoenteral tube is used, the continuous infusion method, with strict control, is appropriate, since the critical patient, due to both pathology and complications, as well as the use of drugs, may have decreased gastric emptying[5,14].

Despite all the benefits and advantages, NT is not a complication-free procedure, because when installed, it can have a negative influence on the patient's recovery and the quality of care provided to the patient. Thus, professionals must recognize and prevent such complications. This study showed that the most common complications are gastrointestinal complications including constipation, vomiting and diarrhea, and metabolic complications with changes in blood glucose levels, corroborating with other authors[6,15]. The occurrence of gastrointestinal and metabolic symptoms is reported in most studies that may be associated with several factors, including the patient's clinical condition, interruption of the diet for procedures, tube exteriorization[2].

The TN is often responsible for the occurrence of complications, however other factors should be considered, from dietary modulation, correct volume management, interruptions, reduced physical mobility, use of antibiotics, sedatives and analgesics used in patients on mechanical ventilation and in a critical state of health. A comprehensive review study showed that constipation in the ICU is frequent and can increase the time the patient uses mechanical ventilation[16].

Another prospective cohort study conducted with 84 patients with a predominance of cardiorespiratory pathology, admitted to the ICU, the researchers showed that the excess of intravenous sodium fluid administered to patients in the first 24 hours received a lower volume of enteral diet. The authors showed that there was a delay in the return of intestinal function, which may contribute to a lower tolerance of enteral nutrition, leading to gastrointestinal dysmotility, vomiting, gastroparesis and adynamic ileum[7].

Metabolic complications such as hyper or

hypoglycemia can also be considered in critically ill patients. The literature shows that hyperglycemia is a problem often found in critically ill patients, which is probably due to an excess of counter-regulating hormones (glucocorticoids, catecholamines, growth hormone and glucagon) and cytokines secreted in situations of metabolic stress, as well as insulin resistance and pre-existing diabetes[17,18].

In this context, nursing care related to NT is essential and its monitoring includes taking care of the patient's position, washing the tube before and after diets and medications, among others. Care from the type of food and assessment of the degree of hydration, characteristics of eliminations and intensive monitoring of laboratory and clinical examinations.

From the observations identified in the care practice, from the discussion with the professionals and from the support promoted by the literature, the results were grouped into thematic categories and subcategories, following the methodological criteria of the PCA. Thus, From the discussion groups, the nursing care package or Bundle was elected by collective construction, in the prevention of complications of nasoenteral catheterization.

These Bundles comprise a small package of interventions recommended and well scientifically evidenced, which considers their applicability and the adherence of the health team, making this tool especially useful for obtaining improvements in care indicators. And yet, they do not need all the therapeutic strategies described, as it aims to apply evidence-based practice and thereby qualify care and prevent complications and injuries. Bundles are made up of three to five items that are essential for the proper functioning and handling of a specific care device or procedure[9].

The choice of care by professionals was guided by evidence to prove its effectiveness and the feasibility of application in the ICU in question. Thus, the Bundle will be highlighted in this category through one-to-one arguments, to highlight the importance of this nursing care package in preventing complications, handling, and maintaining nasoenteral catheterization in a critical patient. The professional activity of the nursing and health team to carry out the Bundle does not require cost and work overload.

The thematic categories present the nursing results for the prevention of complications associated with ET, with the scientific evidence for each care: 1. Headboard elevated 30º to 45º; 2 Pause for nursing and / or medical procedures; 3 Confirmation of positioning and fixation; 4 Gastric residue check (VRG) and 5 Rinse the tube before and after medication.

Maintaining the patient with an elevated headboard 30 to 45º was one of the precautions observed in this study, and the elevation of the headboard showed general compliance> 80%. This assistance is strongly recommended, as it reduces bronchoaspiration and prevents it according to the gravitational effects, especially in patients receiving enteral nutrition[19,20]. The position between 30º to 40º of the head of the bed favors the reduction of gastroesophageal reflux and colonization of the oropharynx with the subsequent aspiration of gastric contents[16,21]. On the other hand, the maintenance of the elevated headboard encounters some resistance in the care practice, with justifications that the patient moves in bed, leading to the risk of injuries to those with impaired skin integrity, and also the possibility of the patient feeling uncomfortable in that position.

Continuous infusion without pause allows the reduction of gastric waste and better absorption of nutrients, since critically ill patients have decreased gastric emptying. Studies show that frequent interruptions caused by health team procedures can interfere with adequate caloric support and interfere with recovery time and weaning from ventilation[3,14]. However, the attention of the nursing team was not observed in pausing the diet at the moments when the head of the bed was below 30º or at a straight angle as in the bathing moments.

Confirmation of the positioning of the probe and its proper fixation must be well-established care, as they are essential care in preventing complications. The exteriorization of the probe as well as its inadequate positioning can cause interruptions in the adequate energy supply as regards bronchial aspirations. The routine observation of this practice was not observed during the period of this study, as well as the periodic evaluation and daily replacement of the fixation site, which are important procedures to avoid adverse events, Signs such as: hyperemia, humidity, traction, friction and discomfort of the patient should be considered. Therefore, it is essential to ensure that the probe remains in the correct location, confirming its positioning using available techniques such as pH verification, abdominal auscultation, use of X-ray. Therefore, patient safety when using enteral diet depends on the process, surveillance and continuous evaluation of health professionals[19,22].

The verification and observation of the volume of gastric waste in this study was not observed in the care practice of health professionals in the studied unit. The control of VRG according to the literature does not present strong scientific evidence, showing that this procedure interferes with the adequate supply of enteral nutrition, energy and protein balance, decreasing the rate of morbidity and mortality in critically ill patients[4,23]. Gastric intolerance is associated with the use of opioids, shock and vasopressors, which reflects unstable and consequently more severe critical patients, who might be eligible for the measurement of VRG.

The American Society of Parenteral and Enteral Nutrition (ASPEN) conducted a literature review on nutrition in critically ill patients whose results recommended, among others, that VRG should no longer be used definitively as part of routine care to monitor ICU patients who received TNE . Gastrointestinal tolerance should be monitored daily through physical examination, abdominal distention, reduced occurrence of flatus, stool characteristics or abnormal abdominal radiographs. The guidelines also suggest the use of protocols with strategies on volume, use of prokinetic agents to improve diet tolerance[21].

For proper administration of drugs through the feeding tube, it is necessary to know the different drug

formulas, as well as the right method of administration. Studies claim that the interaction between medicated drugs and food can result in incompatibility, decreased drug absorption, obstruction of the probe or increase the risk of contamination; recommended sense not to administer medication along with the diet. For a safe practice, the drugs must be given separately, with the probe washing before and after each medication, as the washing allows the probe to permeability[24,25].

Conclusion

During the discussion between the groups to choose the Bundle, there was a note regarding the item hand hygiene. In the consensus it was registered that this practice is one of the main strategies for the prevention of infections related to health care, as recommended by the National Health Surveillance Agency[27] and recommendations of the protocol of the Hospital Infection Control Commission (CCIH) of the institution.

References

1. Araujo FF, Silva CC, Fortes RC. Terapia Nutricional Enteral em Paciente Oncológicos: uma revisão da literatura. Comunicação em Ciência da Saúde. 2008;19(1):61-70.
2. Medeiros IMS, Ritter CG, Ribeiro Filho GHC, Prado PR. Caracterização e adequação energético-proteica da nutrição enteral em pacientes em uma unidade de terapia intensiva. South American Journal of Basic Education, Technical and Technological. 2019;6(2):381-395.
3. Lima LSS, Orange LG, Andrade SP, Costa ICL, Santos EMC. Impacto do estado nutricional e aporte calórico-proteico. Braz. J. of Develop. 2020;6(1):3432-3447.
4. Viana J, Balinha J, Afonso C. Monitorização do volume de resíduo gástrico no doente crítico. Acta Port Nutr. 2017;10:38-42.
5. Yagan Ö, Tas N, Ayyildiz SN, Karakahya M, Noyan T. Comparação dos efeitos da alimentação enteral contínua versus intermitente nos níveis plasmáticos de leptina e grelina em Unidades de Terapia Intensiva. Rev. Nutr. 2017;30(4):409-418.
6. Oliveira JS, Oliveira CC, Araújo CF, Carvalho EA. Diarreia E Constipação em Pacientes em Terapia Nutricional Enteral em um Hospital Universitário de Sergipe. International Journal of Nutrology. 2018;11(S01):S24-S327.
7. Dock-Nascimento DB, Arantes SS, Silva Junior JM, Aguilar-Nascimento JED. A sobrecarga intravenosa de fluidos e sódio pode contribuir para a menor infusão de nutrição enteral em pacientes críticos. Revista Brasileira de Terapia Intensiva. 2019;31(2):202-209.
8. Institute for Healthcare Improvement (IHI). 5 million lives campaign Getting started kit: prevent ventilator associated pneumonia how-to guide. Cambridge, MA (US): IHI, 2010.
9. Chicayban LM, Souza Terra Érika LV, Ribela J dos S, Barbosa PF. Bundles de prevenção de pneumonia associada à ventilação mecânica: a importância da multidisciplinaridade. POBS. 2017;7(25).
10. Trentini M, Paim L. Pesquisa convergente assistencial: um desenho que une o fazer e o pensar na prática assistencial em saúde-enfermagem. 2. ed. Florianópolis: Insular; 2004.
11. Pedrosa KKA, Oliveira SA, Machado RC. Validation of a care protocol for the septic patient in the Intensive Care Unit. Rev Bras Enferm. 2018;71(3):1106-14.
12. Okoshi MP, Capalbo RV, Romeiro FG, Okoshi K. Caquexia Cardíaca: Perspectivas para a Prevenção e Tratamento. Arq Bras Cardiol. 2017; 108(1):74-80.
13. Agência Nacional de Vigilância Sanitária (BR). Medidas de Prevenção de Infecção Relacionada à Assistência à Saúde. Brasília (DF): Anvisa, 2017.
14. Arzápalo MFA, Cabrera DAA, Mukul JJG, Avendaño VGL, Cámara MAC, Lara GAM. Tolerancia nutrición enteral infusión vs bolo, presión intraabdominal y VCO2. Rev Asoc Mex Med Crit Ter Int. 2016;30(3):171-177.
15. Alves TL, Pereira MRS, Leite VAL, Rodrigues ACS, Rego CMWN, Silva LCO, Andrade MCS, Arantes FJC. Alterações metabólicas e sintomas gastrointestinais em pacientes em terapia nutricional em uma unidade de terapia intensiva de um hospital da rede privada da cidade de Lauro de Freitas-BA. BRASPEN J. 2018;33(4):384-90.
16. Ribeiro IV, Cruz I. Nursing evidence-based interprofessional practice guidelines for Intestinal Constipation in ICU-Systematic Literature Review. Journal of Specialized Nursing Care. 2020;12(1).
17. Silva A, Oliveira PF, Silva AS, Petribu V, Moraes M. Hiperglicemia, evolução clínica e estado nutricional de pacientes criticamente enfermos. Nutrición clínica y dietética hospitalaria. 2018;38(2):70-76.
18. Silva VCM, Cruz ICF. Diretrizes de práticas baseadas em evidências de enfermagem para nível de glicose no sangue em UTI - Systematic Literature Review. Journal of Specialized Nursing Care. 2020;12(1).
19. Corrêa APA, Dalla Nora CR, Santos VJ, Viegas GL, Agea JLD, Oliveira ACS, Beghetto MG. Riscos da terapia nutricional enteral: uma simulação clínica. Rev Gaúcha Enferm. 2020;41(esp):e20190159.
20. Barbosa JAG, Carlos CM, Costa RF, Simino GPR. Conhecimento de enfermeiros acerca da terapia nutricional. Rev Enferm Contemp. 2020;9(1):33-40.
21. American Society for Parenteral and Enteral Nutrition (ASPEN). Diretrizes de 2016 para o fornecimento e avaliação da terapia de suporte nutricional em pacientes adultos críticos. JPEN. 2016;40(2):159-211.
22. Xelegati RR, Gabriel CS, Dessotte CAM, Zen YP, Évora YDM. Adverse events associated to the use of equipment and materials in nursing care of hospitalized patients. Rev Esc Enferm USP. 2019;53.
23. Machado LS, Rizzi P, Silva FM. Administração de nutrição enteral em posição prona, volume de resíduo gástrico e outros desfechos clínicos em pacientes críticos. Rev Bras Ter Intensiva. 2020;32(1):133-142.
24. Santos GF, Melo TSD, Pinto JDM, Vasconcelos FFD, Fontenele AEP, Neta MDPB, Rios AJS. Caracterização de fármacos administrados através de tubos de nutrição e possível interação medicamentosa - nutrição enteral. Rev. Bras. Farm. Hosp. Serv. Saúde. 2017;8(3):31-36.
25. Godoi KEP, Penteado STS, Mendes AEM, Andrzejevski VMS. Medicamentos via sonda: perfil prático em um hospital terciário de ensino. Rev. Bras. Farm. Hosp. Serv. Saúde. 2016;7(3):13-18.

26. Agência Nacional de Vigilância Sanitária (BR). Protocolo para prática de higienização das mãos em serviços de saúde. Brasília (DF): Anvisa, 2013.