Complications related to the nasoenteral tube and nursing diagnoses in hospitalized adults: a cohort study

Complicações relacionadas à sonda nasoenteral e diagnósticos de enfermagem em adultos hospitalizados: estudo de coorte

Complicaciones relacionadas con la sonda nasoenteral y diagnósticos de enfermería em adultos hospitalizados: un estudio de cohorte

Franciele Anziliero[1], Michelli Cristina Silva de Assis[2], Mariur Gomes Beghetto[3]

How to cite: Anziliero F, Assis MCS, Beghetto MG. Complications related to the nasoenteral tube and nursing diagnoses in hospitalized adults: a cohort study. 2023; 12(2): 409-18. Doi: https://doi.org/10.36239/revisa.v12.n2.p409a418

REVISA

1. Military Brigade Hospital. Porto Alegre, Rio Grande do Sul, Brazil. https://orcid.org/0000-0002-5650-9709

2. Federal University of Rio Grande do Sul, School of Nursing, Department of Medical-Surgical Nursing. Porto Alegre, Rio Grande do Sul, Brazil. http://orcid.org/0000-0003-2632-5885

3. Federal University of Rio Grande do Sul, School of Nursing, Department of Professional Care and Guidance. Porto Alegre, Rio Grande do Sul, Brazil. http://orcid.org/0000-0002-9437-4999

Received: 13/01/2023
Accepted: 23/03/2023

RESUMO

Objetivo: avaliar a associação entre as complicações relacionadas à sonda nasoenteral e diagnósticos de enfermagem. **Método:** dupla coorte prospectiva de pacientes adultos, usuários de sonda nasoenteral em um hospital universitário. Os dados foram coletados diariamente do prontuário dos pacientes por meio de formulário eletrônico. As complicações relacionadas à sonda nasoenteral foram clínicas (diarreia e constipação) e mecânicas (tração e obstrução). Os diagnósticos de enfermagem avaliados foram aqueles relacionados à nutrição dos pacientes, identificados pela equipe assistente e coletado em prontuário. **Resultados:** Acompanhou-se 494 pacientes, a maioria idosos (69,4%). Do total de pacientes, 38,1% tiveram alguma complicação clínica e, 36,4% apresentaram complicações mecânicas relacionadas à sonda nasoenteral. Pacientes com complicações apresentaram maior número de diagnósticos de enfermagem implementados e tempo de uso de sonda (p<0,001). Deglutição prejudicada (31%) e Nutrição desequilibrada: menos que as necessidades corporais (30%) foram os diagnósticos de enfermagem mais frequentes. **Conclusão:** As complicações relacionadas à sonda nasoenteral ocorreram em percentual elevado. Os pacientes com tais complicações apresentaram maior número de diagnósticos de enfermagem implementados e tempo de uso de sonda.

Descritores: Nutrição Enteral; Intubação Gastrointestinal; Segurança do Paciente; Diagnóstico de Enfermagem; Avaliação em Enfermagem.

ABSTRACT

Objective: to evaluate the association between complications related to the nasoenteral tube and nursing diagnoses. **Method:** double prospective cohort of adult patients using nasoenteral tube in a university hospital. Data were collected daily from the patients' charts using an electronic form. nasoenteral tube-related complications were clinical (diarrhea and constipation) and mechanical (traction and obstruction). The nursing diagnoses evaluated were those related to the patients' nutrition, identified by the assistant team and collected from the medical records. **Results:** 494 patients were followed up, most of them elderly (69.4%). Of the total number of patients, 38.1% had some clinical complication, and 36.4% had mechanical complications related to the nasoenteral tube. Patients with complications had a great number of nursing diagnoses implemented and time using nasoenteral tube (p<0.001). Impaired swallowing (31%) and Unbalanced nutrition: less than body needs (30%) were the most frequent nursing diagnoses. **Conclusion:** Complications related to the nasoenteral tube occurred in a high percentage. Patients with such complications had a greater number of nursing diagnoses implemented and time using nasoenteral tube.

Descriptors: Enteral Nutrition; Gastrointestinal Intubation; Patient Safety; Nursing Diagnosis; Nursing Assessment.

RESUMEN

Objetivo: evaluar la asociación entre las complicaciones relacionadas con la sonda nasoenteral y los diagnósticos de enfermería. **Metodo:** doble cohorte prospectiva de pacientes adultos usuários de sonda nasoenteral en um hospital universitário. Los datos se recogieron diariamente de las historias clínicas de los pacientes mediante un formulário electrónico. Las complicaciones relacionadas con la sonda nasoenteral fueron clínicas (diarrea y estreñimiento) y mecânicas (tracción y obstrucción). Los diagnósticos de enfermería evaluados fueron aquellos relacionados con la nutrición de los pacientes, identificados por el equipo asistencial y recolectados de las historias clínicas. **Resultados**: Se siguieron 494 pacientes, la mayoría ancianos (69,4%). Del total de pacientes, el 38,1% presentó alguna complicación clínica y el 36,4% presentó complicaciones mecánicas relacionadas con el sonda nasoenteral. Los pacientes con complicaciones tuvieron mayor número de diagnósticos de enfermería implementados y tiempo de uso de sonda (p<0,001). Deglución alterada (31%) y Nutrición desequilibrada: inferior a las necessidades corporales (30%) fueron los diagnósticos de enfermería más frecuentes. **Conclusión:** Las complicaciones relacionadas com el sonda nasoenteral ocurrieron em un alto porcentaje. Los pacientes con tales complicaciones tuvieron mayor número de diagnósticos de enfermería implementados y tiempo de uso de sonda.

Descriptores: Nutrición Enteral; Intubación Gastrointestinal; Seguridad del Paciente; Diagnóstico de Enfermería; Evaluación en Enfermería.

ORIGINAL

Introduction

Enteral Nutritional Therapy (NET), through a nasoenteral tube (NSS), reduces malnutrition and, consequently, septic complications and hospital mortality.[1-2] However, there are risks related to this therapy. Among the complications, the most described in the literature are clinical and mechanical, followed by metabolic, respiratory and psychological.[3]

A descriptive study[4], conducted in an Intensive Care Unit (ICU) for trauma victims, followed 22 patients, most of them (81.8%) using NSS. Of the total number of patients, 77.3% had some type of clinical complication, with vomiting being the most frequent (36.3%), followed by diarrhea (31.8%) and constipation (31.8%). Mechanical events such as obstruction and traction or accidental removal of the probe were not observed.[4]

The frequency of mechanical complications presents great variability and may not be reported, as in the previously mentioned study. In routine care, traction or accidental removal of the tube is the most common complication, being described in 15.3%[5] and 43.5%[6] of the patients seen in the emergency service and wards, respectively.

Technical guidelines[7] and legal guidelines[8] that include "Good Practices in the Administration of Enteral Nutrition" have been published in order to reduce these complications. These are guidelines for nurses and the nursing team for safe care, from the establishment of enteral access to the prescription and supervision of enteral feeding.[7] In addition to these documents, national recommendations[9] and international recommendations are added[1-2] that describe care strategies for patients under ENT.

In addition to these guidelines, nurses have an important tool in the daily life of the user of the diet by NSS, the Nursing Process (NP). It aims to identify priority care and interventions and prevent diseases[10], using standardized nomenclatures such as NANDA International, Inc. (NANDA-I).[11] The NP makes it possible to identify the real or potential needs of patients, families and society through the Nursing Diagnoses (ND). These cover a large number of biological, psychological and spiritual needs and make it possible to list specific care for each ND implemented.

NDs related to biological needs are used as beacons of care provided to patients who need NSS. The literature does not have robust studies demonstrating the association of complications related to NSS and the implementation of ND. In this sense, this study aims to evaluate the association between complications related to the nasoenteral tube (NSS) and the implementation of ND.

Method

This is a double-cohort nested in a matrix project whose data were collected in two stages and derived from two doctoral theses in nursing[12-13]: between June and November 2017 (Cohort 1) and between May 2018 and May 2019 (Cohort 2). According to Fletcher[14], the standardization of data collection in cohort studies minimizes selection bias. Therefore, the interval between the cohorts was due to the selection of new research assistants, and the need to train

them, also, for the objectives of the second stage of the matrix project. In both Cohort 1 and Cohort 2, the eligibility criteria, research procedures, and outcomes evaluated were the same. The study was conducted in a general university hospital in southern Brazil, certified by the Joint Commission International (JCI).

We included subjects over 18 years of age, who were admitted to clinical or surgical wards, with NSS (Dobhoff® type,12 French) inserted in the hospital or coming from home. For all patients, a control X-ray is performed to confirm the positioning of the distal tip of the probe. We did not include patients with gastrostomy or jejunostomy, confused or unable to consent to participate, nor those who were hospitalized more than once during the study.

The patients were selected from the electronic system that integrates the entire medical record. A search assistant checked the list of TNE users, identifying those potentially eligible. From the time of inclusion, they were monitored daily, from the first day of prescription of ENT until its suspension, transfer, discharge or hospital death.

Because it is a study derived from a matrix project, the sample was obtained by adding the results of Cohort 1 (n=188) and Cohort 2 (n=306), for this reason an a priori sample estimate was not made. However, according to the incidence of clinical and mechanical complications, it was possible to calculate, subsequently, the sampling power.

Data collection was performed by nine research assistants, all nursing students, supervised by two nurses who work at the hospital where the study was conducted, both doctoral students and responsible for the matrix project. The training of the research team preceded each phase of the study. Two training manuals were used: one on the insertion of the research assistant in the field of study and another specifically on data collection. The purpose of these manuals was to standardize the conduct of the research assistants, from the approach of the patients, the evaluation of the records in the medical record, the observation at the bedside, to the completion of the collection forms. The agreement between the research assistants and the nurses (doctoral students) was tested as a way of certifying the data collection process.

It is important to emphasize that, because it is a hospital accredited by JCI, different courses are required of all researchers and research assistants, in an online platform, related to patient safety, research ethics, among others.

For data collection, electronic forms (Google Forms®) were elaborated that included sociodemographic and clinical data. Among the clinical data, the reason for hospitalization, the reason and the date of insertion of the NSS and Charlson Comorbidity Index (calculation of the risk of death of patients from the clinical history) were evaluated.

Clinical and mechanical complications related to the use of NSS were collected through medical records. Clinical complications included constipation and diarrhea. Constipation was defined as persistent difficulty in evacuating or a feeling of incomplete evacuation and/or infrequent bowel movements for at least three days.[15] Diarrhea was defined as three or more episodes of soft or liquid stools in 24 hours.[16] Mechanical complications included accidental traction or removal of the NSS and obstruction of its lumen. Accidental removal was considered when caused by the patient himself or as a result of care such as change of fixation, bath, alternation of decubitus or exit from the bed.

The implementation of ND was evaluated through electronic medical records. All NDs of the following domains according to NANDA-I[11] were included: Nutrition, Intake class (Impaired swallowing and Unbalanced nutrition: less than body needs; Metabolism class: Risk of unstable blood glucose). From the domain Elimination and exchange, class Gastrointestinal function (Constipation and Diarrhea). From the Activity and Rest domain, Self-care class (Deficit in self-care for feeding). From the Comfort domain, Physical comfort class (Nausea) and, from the Safety/Protection Domain, Physical Injury class (Risk of aspiration), the latter for having enteral nutrition as an associated condition.[11]

The analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 20.0. The continuous variables with normal distribution were described as mean and standard deviation, the others by means of median and interquartile range. Categorical variables were described in absolute numbers and percentages. The comparison of means was performed using the t-student test or the Mann-Whitney test, if normal or asymmetric distribution. Categorical variables were evaluated by the Chi-Square or Fisher's Exact tests, respecting the normality test. The level of significance adopted was 5% ($p < 0.05$).

The research was submitted to and approved by the Ethics and Research Committee of the institution where the study was conducted under number 16-0534. In addition, it was approved regarding its methodological and ethical aspects according to the Certificate of Presentation for Ethical Appreciation (CAAE: 63247916.5.0000.5327) and is in accordance with Resolution 466/2012 of the National Health Council. In addition, the participants or guardians signed the Free and Informed Consent Form, consenting to participate in the study.

Results

We included 494 patients, for whom the incidence of clinical or mechanical complications was 68% (95% CI: 31% - 44.5%), which made it possible to calculate the sampling power of 90%, accepting an error of 5% and a significance level of 95%. Patients were followed for a median of 5 (3-10) days. The minimum age was 18 years and the maximum age was 104 years, most (69.4%) of the patients over 60 years.

The most frequent reason for hospitalization was neoplasms (28.9%) of structures of the mouth, pharynx, larynx and esophagus (n = 70), stomach (n = 25), intestines (n = 13) and other sites (n = 35). The patients had a median of 3 (1 – 4) comorbidities, with 12 being the maximum number of diseases described for the same patient. Systemic arterial hypertension (45.1%), smoking (41.7%), alcoholism (22.7%), diabetes (20.2%) and stroke (11.5%) were the most frequent comorbidities. Of the total sample evaluated, 336 patients (68%) had some type of complication related to the use of NSS. Among the characteristics evaluated, patients in the group with complications had a longer time of use of NSS than patients without complications [7 (4-12) versus 2 (1-4); $p < 0.001$] and a higher percentage of ND implemented (68.2% versus 48.7; $p<0.001$) (Table 1).

Table 1 – Demographic and clinical characteristics of the total sample and of patients with and without complications related to the nasoenteral tube. Porto Alegre, RS, Brazil, 2017-2019.

Variables	Total Sample (n=494; 100%)	With complication (n=336; 68%)	No complication (n=158; 32%)	P value ††
Age (years)	65,1 ± 14,1	65,4 ± 14,5	64,3 ± 13,4	0,434
Male gender (%)	277 (56,1)	194 (57,7)	83 (52,5)	0,322
Education (%)				0,207
Illiterate	20 (4,0)	15 (4,5)	5 (3,2)	
Fundamental incomp./compl.	297 (60,1)	191 (56,8)	106 (67,1)	
Medium incomp./compl.	103 (20,9)	73 (21,7)	30 (19,0)	
Superior incomp./compl.	21 (4,3)	15 (4,5)	6 (3,8)	
Not informed	53 (10,7)	42 (12,5)	11 (7,0)	
Reason for hospitalization (%)				0,403
Neurological	141 (28,5)	93 (27,7)	48 (30,4)	
Cardiovascular	23 (4,7)	20 (6,0)	3 (1,9)	
Respiratory	62 (12,6)	40 (11,9)	22 (13,9)	
Neoplasms	143 (28,9)	96 (28,6)	47 (29,7)	
Gastrointestinal	75 (15,2)	54 (16,1)	21 (13,3)	
Other	50 (10,1)	33 (9,8)	17 (10,8)	
Inpatient unit (%)				0,430
Clinic	280 (56,7)	195 (58,0)	85 (53,8)	
Surgical	214 (43,3)	141 (42,0)	73 (46,2)	
CCI†(%)	4 (3 – 6)	4 (3 – 6)	5 (3 – 7)	0,457
GCS (%)	15 (12 – 15)	15 (12 – 15)	15 (12 – 15)	0,411
Reason for indication of NSS§ (%)				0,473
Sensory demotion	180 (36,4)	120 (35,7)	60 (38,0)	
Dysphagia	91 (18,4)	56 (16,7)	35 (22,2)	
Postoperative	83 (16,8)	60 (17,9)	23 (14,6)	
GIT obstruction||	63 (12,8)	42 (12,5)	21 (13,3)	
Inappetence	48 (9,7)	36 (10,7)	12 (7,6)	
Malnutrition	29 (5,9)	22 (6,5)	7 (4,4)	
BMI classification¶ (%)				0,568
Low weight	57 (14,2)	46 (15,0)	10 (12,6)	
Proper weight	266 (53,8)	173 (51,5)	93 (58,9)	
Overweight	105 (26,2)	75 (27,4)	30 (23,6)	
Obesity	66 (16,5)	42 (15,0)	25 (19,7)	
Days in follow-up – median	5 (3 – 10)	7 (4 – 12)	2 (1 – 4)	<0,001
ND# (%)	306 (61,9)	229 (68,2)	77 (48,7)	<0,001

Data expressed as mean ± standard deviation, or median (25th percentile – 75th percentile), or absolute numbers (relative numbers). *n= number of patients; †CCI= Charlson Comorbidity Index; ‡GCS= Glasgow Coma Scale; §NSS= Nasoenteral probe; || GIT = Gastrointestinal Tract; ¶BMI= Body Mass Index; **OR= Oral Route; # ND = Nursing diagnosis; ††p = significance level.

Among the total number of patients with complications related to the NSS, 38.1% had clinical complications. Diarrhea affected 118 (23.9%) patients and constipation was observed among 95 (19.2%) individuals participating in the study. Mechanical complications occurred in 36.4%. Traction or accidental removal of the tube was the most frequent mechanical complication (n = 163; 33%), followed by obstruction (n = 17; 3.4%). There was no record of diet aspiration during the conduct of the study.

Of the total number of patients evaluated, 62% of them had the implementation of at least one diagnosis related to the NSS or complications derived from the use of this device. 71% had only one ND implemented, 24% had two, and 5% had three. Impaired swallowing (31%), Unbalanced nutrition: less than body needs (30%) and Deficit in self-care for feeding (6%) were the most implemented NDs. On the other hand, Risk of aspiration was the least frequent (0.5%).

Discussion

The present study analyzed the data of adult patients using NSS, with and without clinical or mechanical complications related to this therapy. It was possible to establish that patients with complications related to the NSS are those who remained more days with the probe, as well as having a higher number of Nursing Diagnoses implemented.

Few well-designed prospective studies have evaluated the presence of complications related to the NSS and the implementation of ND that guide the care of these patients. The analysis showed that patients with complications had a higher proportion of NDs related to the Nutrition Domain. This result can be explained by the reverse causality bias, already demonstrated in other studies[17-18], that is, patients with more complications have a higher proportion of NDs. This may occur because in the care routine of the hospital where the study is conducted, the evaluation of all patients is daily, so that the nurse, through the NP, identifies the priority demands and establishes new diagnoses that direct different care. In addition, because there is no single ND that covers all care, including those related to complications with NET, a greater number of NDs is necessary to expand the range of care.

Studies on the application of ND in patients requiring NSS are rare. In a study conducted in the emergency department of the same hospital where the present study was based, 150 enteral tube insertions were analyzed in 115 patients. Only in 20.7% of the patients had some ND related insertion, maintenance of the nasoenteral tube or to ENT in the first 24 hours after the insertion of the probe. The diagnosis "Unbalanced nutrition: less than body needs" was the most frequent (71%, n= 22). Impaired swallowing was related to 16%.[19] In the present study, 64% had ND related to the insertion or maintenance of the nasoenteral tube.

NDs are clinical judgments about the current or potential reactions to individuals' health problems. They are the basis for the choice of nursing interventions, as well as for achieving the results for which the nurse is responsible.[20] By using the nursing diagnoses "Impaired swallowing" and/or "Unbalanced nutrition: less than body needs" it is possible to subsidize the clinical judgment of the nurse to prioritize nutritional care.[20]

The hospital scenario needs changes in relation to ND, aiming to develop the awareness of the health team and improve their decision-making skills to develop more appropriate and efficient interventions, resulting in better care and results for the patient. A study[21] with 101 clinical and surgical patients using ENT and parenteral showed that, according to the subjective global assessment, 55.4% of the patients had some degree of malnutrition and 31.7% had no reported Nursing Diagnosis.

In our study, the nursing diagnosis "Impaired swallowing" was implemented for about one third of the patients. On the other hand, a study[22] that evaluated children with impaired swallowing encephalopathy was identified in more than half (59.8%) of the patients. Because it presents high sensitivity and specificity with signs and symptoms of swallowing difficulties[22], this ND when implemented early can be used as a warning sign and, therefore, a means to prevent respiratory complications.

Although enteral nutrition is a condition associated with the ND "Risk of Aspiration", in the present study, it was implemented only for 0.5% (n = 3) of the patients. This percentage is 100 times lower than that found in a study conducted in an adult ICU, which evaluated the same ND and the relationship with its risk factors.[23] The ND "Risk of Aspiration" was listed for 50% of the patients and the authors demonstrated that this ND was associated with the use of probe and enteral nutrition, impaired swallowing, slow gastric emptying, in addition to the use of endotracheal tube and reduction in the level of consciousness.

Finally, among the limitations of the study, we can mention other variables that were not followed by us, which were prospectively followed by us, which allowed us to shed light on, for example, the importance of the daily review of the NDs implemented and the permanence of the companion.

It is noteworthy that our study aimed to evaluate not only the complications related to NET, but also the impact of NDs using methodological rigor. Among the contributions, the study suggests that the higher proportion of NDs implemented to patients with more complications may be related to nurses' concern to generate care prescriptions directed to demands. In addition, it warns of the need for more research capable of demonstrating the contribution of NP in the safety of patients using NSS.

Conclusion

Complications related to the NSS occurred in more than 60% of the patients followed. Patients with complications related to the NSS were the ones who remained more days with the tube and had a higher frequency in the implementation of ND directing to specific nursing care. Future research covering the area of NET, especially due to the lack of specific NDs for patients using NSS, represent a promising field to be explored by nurses. Likewise, the participation of companions as active figures in the safe care process should be the agenda of researchers.

Aknowledgment

This study was funded by the authors themselves.

References

1.Fuentes Padilla P, Martínez G, Vernooij RW, Urrútia G, Roqué I Figuls M, Bonfill Cosp X. Early enteral nutrition (within 48 hours) versus delayed enteral nutrition (after 48 hours) with or without supplemental parenteral nutrition in critically ill adults. Cochrane Database Syst Rev. 2019 Oct 31;2019(10):CD012340. doi: https://doi.org/10.1002/14651858.CD012340.pub2

2.Zoeller S, Bechtold ML, Burns B, Cattell T, Grenda B, Haffke L, Larimer C, Powers J, Reuning F, Tweel L, Guenter P; ASPEN Enteral Nutrition Task Force. Dispelling Myths and Unfounded Practices About Enteral Nutrition. Nutr Clin Pract. 2020;35(2):196-204. doi: https://doi.org/10.1002/ncp.10456

3.Gimenes FRE, Baracioli FFLR, Medeiros APd, Prado PRd, Koepp J, Pereira MCA, et al. Factors associated with mechanical device-related complications in tube fed patients: A multicenter prospective cohort study. PLoS ONE. 2020; 15(11): e0241849. doi: https://doi.org/10.1371/journal.pone.0241849

4.Nunes GKF, Rosa LPS. Gastrointestinal complications of enteral nutritional therapy in patients with critical conditions. Brasília Med.2012; 49(3):158-162.

5.Anziliero F, Beghetto MG. Incidents and adverse events in enteral feeding tube users: warnings based on a cohort study. Nutr Hosp. 2018; 35(2):259-264.doi: https://doi.org/10.20960/nh.1440.

6.Cervo AS, Magnago TSBS, Carollo JB, Chagas BP, Oliveira AS, Urbanetto JS. Adverse events related to the use of enteral nutritional therapy. Rev Gaúcha Enferm. 2014; 35(2):53-9. doi: https://doi.org/10.1590/1983-1447.2014.02.42396

7.Brasil. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. Resolução RDC nº 503, de 27 de maio de 2021. Diário Oficial da União. Edição: 101. Seção: 1. Página: 113. [Internet]2021 [citado 2023 mai 03]. Disponível em: https://www.in.gov.br/web/dou/-/resolucao-rdc-n-503-de-27-de-maio-de-2021-322985331

8.Conselho Federal de Enfermagem - COFEN. Resolução COFEN n° 619 de 04 de novembro de 2019. [Internet]. 2019 [citado 2023 mai 03]; 1-5. Disponível em: http://www.cofen.gov.br/resolucao-cofen-no-619-2019_75874.html

9.Matsuba CST, Serpa LF, Pereira SRM, Barbosa JAG, Corrêa APA, Antunes MS, et.al. BRASPEN – Brazilian Society of Parenteral and Enteral Nutrition. Diretriz BRASPEN de Enfermagem em Terapia Nutricional Oral, Enteral e Parenteral. BRASPEN J. 2021; 36 (Supl3): 2-62.

10.Conselho Federal de Enfermagem. Resolução nº 358 de 15 de outubro de 2009. Dispõe sobre a Sistematização da Assistência de Enfermagem e a implementação do Processo de Enfermagem em ambientes, públicos ou privados, em que ocorre o cuidado profissional de Enfermagem, e dá outras providências. Brasília: COFEN; [Internet]. 2009 [citado 2023 mai 01]. Disponível em: http://www.cofen.gov.br/resoluo-cofen-3582009_4384.html

11.Herdman TH, Kamitsuru S, Lopes CT. Diagnósticos de enfermagem da NANDA: definições e classificação 2021-2023/ [NANDA International]. 12ª ed. Rio de Janeiro: Thieme; 2021.

12.Correa, APA. Efeito de uma intervenção educativa e de uma campanha de identidade visual sobre o cuidado ao paciente em uso de sonda nasoenteral: ensaio clínico**.** 2019. Doutorado em ENFERMAGEM Instituição de Ensino: Universidade Federal do Rio Grande do Sul, Porto Alegre Biblioteca Depositária: EENF/UFRGS.

13.Silva, SMR. Impacto de uma Campanha de Identidade Visual sobre o processo de administração de dieta por sonda nasoenteral e sobre a segurança do paciente: Ensaio clínico aberto. 2019. Doutorado em ENFERMAGEM Instituição de Ensino: Universidade Federal do Rio Grande do Sul, Porto Alegre Biblioteca Depositária: EENF/UFRGS.

14.Fletcher RH, Fletcher SW, Fletcher GS. Clinical Epidemiology The Essentials. 5º ed. Artmed: Porto Alegre; 2014.

15.Sadeghi A, Akbarpour E, Majidirad F, Bor S, Forootan M, Hadian MR, Adibi P. Dyssynergic Defecation: A Comprehensive Review on Diagnosis and Management. Turk J Gastroenterol. 2023 Mar;34(3):182-195. doi: https://doi.org/10.5152/tjg.2023.22148

16.Reintam Blaser A, Preiser JC, Fruhwald S, Wilmer A, Wernerman J, Benstoem C, Casaer MP, Starkopf J, van Zanten A, Rooyackers O, Jakob SM, Loudet CI, Bear DE, Elke G, Kott M, Lautenschläger I, Schäper J, Gunst J, Stoppe C, Nobile L, Fuhrmann V, Berger MM, Oudemans-van Straaten HM, Arabi YM, Deane AM; Working Group on Gastrointestinal Function within the Section of Metabolism, Endocrinology and Nutrition (MEN Section) of ESICM. Gastrointestinal dysfunction in the critically ill: a systematic scoping review and research agenda proposed by the Section of Metabolism, Endocrinology and Nutrition of the European Society of Intensive Care Medicine. Crit Care. 2020 May 15;24(1):224. doi: 10.1186/s13054-020-02889-4.

17.Petry PC, Victora CG, Santos IS. Adults free of caries: a case-control study about: awareness/consciousness, attitudes and preventive practices. Cad. Saúde Pública. 2000; 16(1):145-53. doi: https://doi.org/10.1590/S0102-311X2000000100015

18.Silva DMC, Santos TSS, Conde WL, Slater B. Nutritional status and metabolic risk in adults: association with diet quality as assessed with ESQUADA. Rev Bras Epidemiol. 2021; 24: E210019. doi: https://doi.org/10.1590/1980-549720210019

19.Anziliero F, Corrêa APA, Batassini E, Soler BED, Silva BA, Beghetto MG. Implementation of nursing diagnoses and care after nasoenteral tube placement in an emergency service. Cogitare Enferm. 2017; (22)4: e50870. doi: http://dx.doi.org/10.5380/ce.v22i4.50870

20.Brunner S, Mayer H, Breidert M, Dietrich M, Müller-Staub M. Developing a nursing diagnosis for the risk for malnutrition: a mixed-method study. Nurs Open. 2021; 8(3):1463-78. doi: https://doi.org/10.1002/nop2.765

21.Nogueira DA, Ferreira LP, de Lúcia RPA, Pena GDG. High Frequency of Non-Compliance with Quality Indicators of Enteral and Parenteral Nutritional Therapy in Hospitalized Patients. Nutrients. 2020;12(8):2408. doi: https://doi.org/10.3390/nu12082408

22.Silva RA, Silva VM, Lopes MVO, Guedes NG, Oliveira-Kumakura AR. Diagnostic Accuracy of the Defining Characteristics of Impaired Swallowing in

Children with Encephalopathy. Journal of Pediatric Nursing. 2020; 52:7–14. doi: https://doi.org/10.1016/j.pedn.2019.10.006

23.Carvalho GJ, Cruz ICF. Evidence-based practice guidelines for the nursing intervention: Risk of aspiration in ICU - Systematic Literature Review. Journal of Specialized Nursing Care.2018;10:1.

Correspondent Author
Michelli Cristina Silva de Assis.
77 Roque Gonzáles St., floor. 205. Zip: 90690-270- Botanical Garden. Porto Alegre, Rio Grande do Sul, Brazil.
michellicassis@gmail.com