ESTIMA
Brazilian Journal of Enterostomal Therapy

ARTIGO ORIGINAL
https://doi.org/10.30886/estima.v20.1165_IN

ADHESION OF ASSISTANCE PROTOCOL ON NASOENTERAL CATHETER FIXATION

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ABSTRACT

Objective: To verify the adherence of the nursing team to a care protocol for the fixation of a nasoenteral catheter, after a health education action. Methods: Quantitative, cross-sectional, field, observational and descriptive study in a hospital in the city of Rio de Janeiro. It consisted of two stages: health education action on a nasoenteral catheter fixation protocol and data collection after health education action, in the form of non-participant observation, using an instrument containing information regarding the presence of fixation, type of fixation, record of the date of the procedure and conditions of fixation of the nasoenteral catheter. Results: Health education actions encompassed the participation of 133 nursing professionals. Of the 123 patients observed, 100% had fixation, the most prevalent being nasal fixation (60.16% / n = 74). In 68.29% (n = 84) there was no date record, 95.93% (n = 118) and 87.80% (n = 108) had good cleaning and adherence conditions, respectively. Conclusion: A satisfactory result was not achieved regarding adherence to the type of fixation and registration of the date of the procedure. Despite the unsatisfactory adherence, there was a high positive correlation between the professionals' adherence to the education actions and the correctness ratio of the type of fixation.

DESCRIPTORS: Enteral nutrition. Equipment and supplies. Nursing assessment. Health education. Nursing team. Enterostomal therapy.

ADESÃO DE PROTOCOLO ASSISTENCIAL SOBRE FIXAÇÃO DE CATETER NASOENTERAL

RESUMO

Objetivo: Verificar a adesão da equipe de enfermagem a um protocolo assistencial de fixação de cateter nasoenteral, após ação de educação em saúde. **Método:** Estudo quantitativo, transversal, de campo, observacional e descritivo, em um hospital no município do Rio de Janeiro. Constituiu-se de duas etapas: ação de educação em saúde sobre um protocolo de fixação de cateter nasoenteral e coleta de dados após ação de educação em saúde, sob a forma de observação não participante, com a utilização de instrumento contendo informações referentes à presença de fixação, tipo de fixação, registro da data do procedimento e condições da fixação do cateter nasoenteral. **Resultados:** As ações de educação em saúde abrangeram a participação de 133 profissionais

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Section Editor: Isabel Cristina Ramos Vieira Santos
Received: Dez. 11, 2021 | Accepted: Fev. 24, 2022
How to cite: Sé ACS; Oliveira RCS; Trivino GS; Lobato IS; Medeiros FM; Gonçalves RCS; Pestana LC; Gonçalves EF; Tonini T; Figueiredo NMA (2022) adhesion of assistance protocol on nasoenteral catheter fixation. ESTIMA, Braz. J. Enterostomal Ther., 20: e0422. https://doi.org/10.30886/estima.v20.1165_IN

de enfermagem. Dos 123 pacientes observados, 100% possuíam fixação, sendo a mais prevalente a fixação nasal (60,16% / n = 74). Em 68,29% (n = 84) não havia registro de data, 95,93% (n = 118) e 87,80% (n = 108) apresentavam boas condições de limpeza e aderência, respectivamente. **Conclusão:** Não se atingiu um resultado satisfatório quanto à adesão ao tipo de fixação e registro da data do procedimento. Apesar da adesão insatisfatória, houve alta correlação positiva entre a adesão dos profissionais nas ações de educação e razão de acerto do tipo de fixação.

DESCRITORES: Sondas de alimentação enteral. Dispositivos médicos. Protocolos de enfermagem. Educação em saúde. Equipe de enfermagem. Estomaterapia.

ADHESIÓN DEL PROTOCOLO DE ASISTENCIA SOBRE FIJACIÓN DE CATÉTER NASOENTERAL

RESUMEN

Objetivo: Verificar la adhesión del equipo de enfermería a un protocolo de asistencia para la fijación de catéter nasoenteral, después de una acción de educación en salud. **Método:** Estudio cuantitativo, transversal, de campo, observacional y descriptivo en un hospital de la ciudad de Río de Janeiro. Constó de dos etapas: acción de educación en salud sobre un protocolo de fijación de catéter nasoenteral y recolección de datos después de la acción de educación en salud, en la forma de observación no participante, utilizando un instrumento que contiene información sobre la presencia de fijación, tipo de fijación, registro de la fecha del procedimiento y condiciones de fijación del catéter nasoenteral. **Resultados:** Las acciones de educación en salud contaron con la participación de 133 profesionales de enfermería. De los 123 pacientes observados, el 100% presentaba fijación, siendo la más prevalente la fijación nasal (60,16% / n = 74). En el 68,29% (n = 84) no hubo registro de fecha, el 95,93% (n = 118) y el 87,80% (n = 108) tuvieron buenas condiciones de limpieza y adherencia, respectivamente. **Conclusión:** No se logró un resultado satisfactorio en cuanto a la adherencia al tipo de fijación y registro de la fecha del procedimiento. A pesar de la adhesión insatisfactoria, hubo una alta correlación positiva entre la adhesión de los profesionales a las acciones de educación y la razón de acierto del tipo de fijación.

DESCRIPTORES: Nutrición enteral. Dispositivos médicos. Evaluación en enfermería. Educación en salud. Grupo de enfermería. Estomaterapia.

INTRODUCTION

The enteral catheter consists of a silicone, rubber or polyurethane tube for hydration, administration of enteral nutrition and/or medication in patients with altered level of consciousness, coma, mechanical ventilation and difficulty in swallowing[1,2].

The enteral catheter inserted through the nose, called nasoenteral, is part of the scope of this study. Inserting the device requires care of greater technical-scientific complexity and the ability to make immediate decisions, which is exclusive to the nurse, with regard to the nursing team[3]. The execution of the procedure involves choosing the caliber of the catheter according to the medical prescription and the established purpose, orientation to the patient and/or companion, preparation of the environment, insertion technique, confirmation of the positioning, device fixation, measurement of the external part of the catheter and nursing record[4].

Despite being a common practice in health institutions and a favorable resource for patients with a functioning gastrointestinal tract, but with the impossibility of oral ingestion, the insertion of the nasoenteral catheter can cause risks to patient safety and adverse events[4]. Multiple occurrences with significant morbidity and mortality are described in the literature, increased length of hospital stay[5], respiratory, esophageal and pharyngeal complications, intestinal perforation, intracranial perforation, fixation-related injury, incorrect connection, obstruction and accidental catheter removal[1].

Among the nursing interventions for patients using a nasoenteral catheter, we highlight the fixation of the catheter to keep the device in the correct place, preventing displacement, new insertions, delay in drug or nutritional therapy and risk of bronchoaspiration[6]. It should be performed immediately after insertion of the device and in the programmed changes

of the fixation, according to the institutional protocol. During its maintenance, aspects concerning adherence and cleaning need to be strictly observed by the nursing team, ensuring the effectiveness of the fixation and identification of possible risks of catheter externalization.[4,7,8].

It is essential to adopt care protocols based on scientific evidence for the development of a safe and systematized care practice, minimizing the risks of complications involving gastrointestinal devices[4]. Thus, health education has been a strategy for the discussion of good practices, widely publicized as a useful tool for the construction of collective knowledge, critical reflections, with positive results in the adherence to care protocols[7].

In this context, this study is justified for the expansion of knowledge on the subject, the identification of gaps in the work process of the nursing team, an indicator of care quality, planning and execution of interventions for the safety of hospitalized patients and those using nasoenteral catheter.

Thus, it aims to verify the adherence of the nursing team to a care protocol for the fixation of a nasoenteral catheter, after a health education action.

METHOD

The study is quantitative, cross-sectional, field, observational and descriptive, guided by the tool Strengthening the Reporting of Observation Studies in Epidemiology (STROBE), approved by the Research Ethics Committee of the *Hospital Federal Cardoso Fontes*, under Opinion number 5,157.897.

It was carried out at the Clinical Inpatient Unit (CIU), Intensive Care Center (ICU) and Emergency, of a medium-sized hospital located in the city of Rio de Janeiro (RJ), Brazil.

Inclusion criteria for participation in health education actions were: CIU, ICU and emergency nursing professionals. For non-participant observation, they were: adult patients, using a nasoenteral catheter, admitted to the CIU, ICU and emergency room.

Exclusion criteria for participation in health education actions were: nursing professionals absent from the shift due to leave and vacation during the period. For non-participant observations were: patients undergoing procedure or absent from bed and/or ward at the time of data collection.

Analysis instrument developed by the authors of the study, containing data related to the hospital sector (CIU, ICU and emergency), total number of hospitalized patients using nasoenteral catheter, existence of fixation (yes or no), type of fixation (nasal, nasal and frontal, nasal and lateral region of the face and others), registration of date of fixation (yes or no) and conditions of fixation (clean, dirty, adhered, detaching and loosening). A pilot test of the instrument was carried out by one of the authors on three consecutive dates in March 2021. The experience was collectively discussed between the members of the Multidisciplinary Continuing Education Service and the Wound Prevention and Treatment Commission (*Serviço de Educação Permanente Multidisciplinar e Comissão de Prevenção e Tratamento de Feridas*), without the need for reformulations or adaptations. The data referring to the 20 observations recorded in this stage of the study were discarded, not being part of the scope of the results presented.

The development consisted of two stages: health education action and data collection after health education action.

The first stage, health education action, was carried out by the Multidisciplinary Permanent Education Service together with the Wound Prevention and Treatment Commission, from the study scenario, from a theoretical-practical approach. For the theoretical approach, an instructional video about the commercial device was used for fixation of nasoenteral catheter belonging to the grid of hospital supplies and verbal exposition of the institutional protocol. There was a discussion about the necessary materials, guidelines for the patient, family members and/or companions, skin preparation, application of fixation with a commercial device and fixation technique in "I" with microporous hypoallergenic tape or medical patches (Fig. 1), monitoring and exchange, removal and general care. For the practical approach, a low-fidelity mannequin with a nasoenteral catheter was used. All topics were demonstrated by one of the facilitators. Afterwards, the professionals were invited to perform the steps of skin preparation, fixation and removal of the catheter fixation. The health education actions comprised the months of May and June 2021, in the CIU, ICU and emergency, with the participation of nurses and nursing technicians.

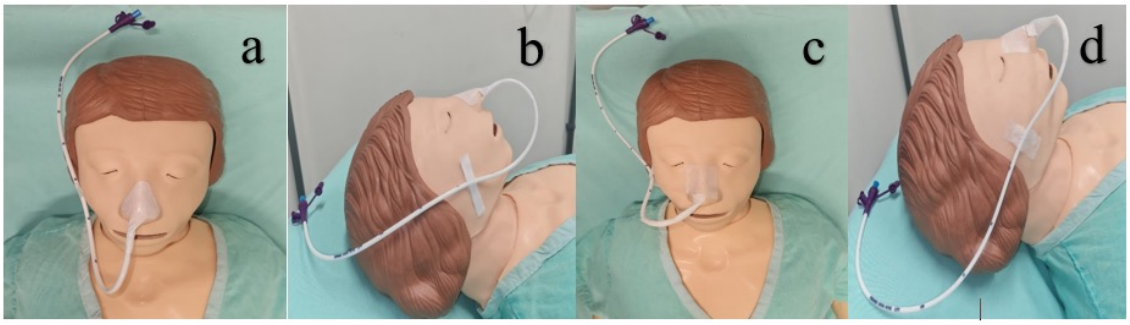

Figure 1. Fixation with commercial device (a and b) and fixation technique in "I" with microporous hypoallergenic tape or medical patches (c and d), according to institutional protocol.
Source: Prepared by the authors.

The second stage, data collection after health education action, was carried out through non-participant observation by nurses from the Wound Prevention and Treatment Commission, at CIU, ICU and emergency, during the months of July and August 2021. We reiterate that there was no verbal contact with the nursing team, nor with any patient.

In the data analysis phase, the instrument data was tabulated in the Microsoft Excel program and manipulated using the Python programming language. Absolute and relative frequencies were calculated, presented in tables. For the association between the variables "employees' adherence to health education actions" and "accuracy ratio of type of fixation", Pearson's correlation coefficient and the interpretation interval proposed by Mukaka were used9, according to Table 1.

Table 1. Golden rule for interpreting Pearson's correlation coefficients. Rio de Janeiro (RJ), Brasil – 2021.

Correlation coefficient	Interpretation
0.90 to 1.00 (–0.90 a –1.00)	Very high positive (negative) correlation
0.70 to 0.90 (–0.70 a –0.90)	High positive (negative) correlation
0.50 to 0.70 (–0.50 a –0.70)	Moderate positive (negative) correlation
0.30 to 0.50 (–0.30 a –0.50)	Low positive (negative) correlation
0.00 to 0.30 (–0.00 a –0.30)	Insignificant (negative) correlation

Source: Obtained from Mukaka (2012)[9].

RESULTS

The health education actions on the nasoenteral catheter fixation protocol encompassed the participation of 133 nursing professionals, 65 of whom were nurses and 68 were nursing technicians. The content presented is shown in Table 2.

After carrying out the health education actions, adherence to the protocol was measured regarding the presence of fixation, type of fixation (the nasal and lateral facial fixation being considered correct), date registration and conditions of the procedure. fixation in terms of cleanliness (clean and dirty) and adhesiveness (sticking, peeling or loosening).

Of the 123 observations performed, all patients with a nasoenteral catheter had fixation, the most prevalent being the nasal type fixation (60.16%; n = 74). Regarding the date record, they were not present in 68.29% of the fixations (n = 84). Cleaning and adherence of nasoenteral catheter fixation were satisfactory in 95.93% (n = 118) and 87.80% (n = 108), respectively.

Table 2. Institutional protocol for nasoenteral catheter fixation. Rio de Janeiro (RJ), Brasil – 2021.

Materials	Tray; procedure gloves;skin protector in spray; commercial device suitable for fixation, microporous hypoallergenic tape or medical patches; compress, gauze or cotton; water and soap; scissors.
Patient orientation	Advise the patient, family member and/or companion about the procedures and necessary care to maintain the fixation and immediately inform the health team in case of inadvertent externalization of the nasoenteral catheter or compromised fixation (dirt, humidity, low adhesion or loosening).
Skin prep	1. Remove oil and dirt from the patient's skin. The skin must be dry, free of solution residues and oiliness to ensure good adhesion and avoid skin irritations. 2. Use a skin protector spray on the areas of the skin where the patch to protect the skin tissue from injury will be applied. 3. Allow the solution to dry naturally before attaching the patch. 4. Reapplication of the skin protector is necessary at each exchange of the nasoenteral catheter fixator.
Application	1. Perform the nasoenteral catheter insertion procedure according to the protocol established by the institution. 2. In the case of a commercial fixing device, read the instructions that are usually placed on the back of the package; Open the package and remove the device. Follow the product manufacturer's recommendations. 3. In the case of using microporous hypoallergenic tape or medical patches, perform an "I" fixation technique in the nasal region and extra tapes on the side of the face. A piece of tape should be cut, between 5 and 10 centimeters, depending on the patient's anatomy, making four small cuts. Afterwards, fold them inwards like an envelope (where the side with the adhesive is located), giving the shape of an "I". 4. Apply the upper part of the "I" fixer to the bridge of the nose with gentle digital pressure for better adhesion. Position the body of the "I" over the nasoenteral catheter. With the lower part of the "I", wrap the nasoenteral catheter. 5. Use two extra tapes to fix the nasoenteral catheter on the side of the face, always on the same side of the nostril with the catheter, aiming at greater stabilization and reducing the risk of accidental exteriorization. To do this, cut two strips of the same size. Stick a strip to the skin, position the catheter over the strip and fix the tube with the other strip.
Monitoring and exchange	1. The fixator must be monitored continuously to identify early signs of damage catheter dislodgement and possible pressure injury related to the medical device. 2. Change the catheter fixator every 24 hours in case of using microporous hypoallergenic tape or medical patches, and if using a commercial device, every 72 hours or earlier, whenever it is loose, dirty, wet or with low adhesion.
Removal	1. Start by removing the tapes placed on the side of the face. 2. Unroll the lower part of the fixative applied to the catheter. 3. Remove the upper part of the fixator, applied over the nose, releasing it completely. 4. Keep the catheter manually stabilized throughout the procedure.
Warnings	1. Do not pull the nostril during fixation to avoid skin injuries and ruptures due to moisture and local friction. 2. Fixation should not be performed over areas with signs of infection or injured skin. Always notify and report the occurrence of a medical device injury. 3. Traumatic removal may cause premature desquamation of the stratum corneum, causing erythema and possible blistering. 4. When removing the fixations on the skin, use gentle movements, at a 180° angle, stabilizing the surrounding skin with the digital pulps.

Source: Prepared by the authors.

The type of fixation of the nasoenteral catheter adopted by the sector is described in Table 3. Despite the low adherence to the standard established by the protocol, the CIU stood out with the best result. The type of fixation "others" refers to an observation related to the fixation of the nasoenteral catheter in the nasal region and in the chin.

Table 3. Type of fixation applied to the nasoenteral catheter by observation site. Rio de Janeiro (RJ), Brasil – 2021.

Fixation Type	Total		CTI		Emergency		CIU	
	n	%	n	%	n	%	n	%
Nose	74	60.16%	34	62.96%	23	63.89%	17	51.52%
Nose and side of the face	46	37.40%	19	35.19%	13	36.11%	14	42.42%
Nose and frontal region	2	1.63%	0	0.00%	0	0.00%	2	6.06%
Others	1	0.81%	1	1.85%	0	0.00%	0	0.00%
Total	123	100.00%	54	100.00%	36	100.00%	33	100.00%

Source: Prepared by the authors.

The nonconformities regarding the type of fixation of the nasoenteral catheter, absence of date, dirty fixation and detaching are presented in Table 4.

Table 4. Non-conformities regarding the fixation of the nasoenteral catheter, absence of date, dirty fixation and detaching. Rio de Janeiro (RJ), Brasil – 2021.

Local	Total fixings	Wrong fixing*		No date		Dirty		Detaching or loose	
	n	n	%	n	%	n	%	n	%
CTI	54	35	64.81%	27	50.00%	2	3.70%	10	18.52%
Emergency	36	23	63.89%	29	80.56%	0	0.00%	2	5.56%
CIU	33	19	57.58%	28	84.85%	3	9.09%	3	9.09%
Total	123	77	62.60%	84	68.29%	5	4.07%	15	12.20%

*Standards adopted that differ from the institutional protocol (nasal, nasal and frontal, and nasal and chin) were categorized as wrong fixation. Source: Prepared by the authors.

Regarding participation in education actions, the sector with the highest adherence was CIU, followed by emergency and CTI. Table 5 details this information, as well as the ratio for correct and incorrect fixation according to the institutional protocol.

Table 5. Ratio of employee adherence to health education actions and ratio of error and success regarding the institutional protocol for fixation of nasoenteral catheters. Rio de Janeiro (RJ), Brasil – 2021.

Local	Total employees* n	Participants in health education actions n	Employee adherence ratio in health education actions %	Wrong fixing n	Right fixing n	Fixing type correct ratio %
CTI	74	34	45.95%	35	19	35.19%
Emergency	106	62	58.49%	23	13	36.11%
CIU	56	37	66.07%	19	14	42.42%
Total	236	133	56.36%	77	46	37.40%

* Employees absent from the shift due to leave and vacation were not part of the population. Source: Prepared by the authors.

Pearson's correlation coefficient was used as a statistical method of measurement between the variables employee adherence ratio in health education actions and hit ratio of the type of fixation. Logarithmic normalization of the values

was performed after calculating the correctness ratio of the type of fixation (correct observations/total observations) and the ratio of employees' adherence to health education actions (participating employees/total employees), obtaining the Pearson's correlation coefficient of 0.83 as shown in Table 6.

Table 6. Pearson's correlation coefficient between the rate of success of the type of fixation and the ratio of employee adherence to health education actions. Rio de Janeiro (RJ), Brasil – 2021.

Variables	Fixation type hit ratio	Employee adherence ratio in health education actions
Fixation type hit ratio	1.00	0.83
Employee adherence ratio in health education actions	0.83	1.00

Source: Prepared by the authors.

DISCUSSION

The results showed low adherence to the institutional protocol for fixation of nasoenteral catheters, regarding the type of fixation and recording of the date.

According to institutional protocol, the fixation of the nasoenteral catheter in the nose and side of the face was adopted as a guideline. It is a technique with less interference in the patient's aesthetic self-perception, in addition to the fact that the two fixation points described provide stabilization and reduce the risk of accidental catheter exteriorization.

Diverse techniques were identified in the literature, covering fixations on the wing of the nose[6], upper lip with reinforcement on the back of the nose and frontal region[10], bridge of nose and patient's shirt[11],with microporous hypoallergenic tape, medical patches, commercial fixation device, prototype with spring-adjustable traction[12] and nasal bridles[13].

Still on the inputs to perform the fixation of the nasoenteral catheter, a study highlighted the increased risk of skin lesions when using tapes and transparent adhesives; and pressure injury, internal nose injury and epistaxis in the case of nasal bridle strain[2]. American studies have reported occurrences of spontaneous avulsion of the magnet of the nasal bridle system during the insertion procedure, with the need to perform digestive endoscopy to remove the foreign body[14,15].

The risk of impaired skin integrity and risk of pressure injury associated with medical devices for fixation of the nasoenteral catheter are highlighted[16],minimized with the planning, prescription and performance of nursing care related to effective surveillance, inspection and protection of the skin, non-traction of the catheter in the nostril, stabilization of the catheter and adequate fixation[17,18].

It was observed in the ICU the application of fixation of the nasoenteral catheter in the nose and chin. The clinical condition of the patient was not part of the scope of the research, however it is emphasized that this type of stabilization can make speech difficult in case of consciousness. As well as in nursing care for inspection of the oral cavity, oral hygiene and airway aspiration.

There is no agreement on the technique or device for fixation of the nasoenteral catheter[19]. Regardless of the reference to be used and/or standardized in health institutions, the minimization of risks to the patient, reduction of impacts on clinical recovery, less visual impairment and, when possible, consultation with patients and family members must be ensured[20].

Fixations performed on the skin with microporous hypoallergenic tape or medical patches are the most commonly used in different countries and contexts[19]. There is a high incidence of unplanned removal of the nasoenteral catheter, either by patients with an altered level of consciousness or during nursing care[1,6,13,14].

Good conditions of nasoenteral catheter fixation are essential for stabilization and reduction of adverse events related to exteriorization. Factors associated with the failure of the method to succeed with the use of tapes or a commercial device for fixation may be linked to poor adherence by facial hair, perspiration and skin oiliness[19].

In this study, detaching or loose fixations were identified, with the highest number of observations in the CTI. Despite a relatively low frequency, these are circumstances that expose patients to risks of therapeutic interruption and new attempts

to insert the catheter[1]. One study confirmed the benefits regarding the efficiency of nasoenteral catheter fixation, estimating a reduction of 1,422 pneumonia or pneumothorax and 768 fewer deaths in the UK[13].

The absence of the date was found in most of the fixations, with a predominance of nonconformities in the CIU, followed by emergency and ICU. The registration of the date of fixation of the nasoenteral catheter allows the knowledge and monitoring of the application of the device[18], justifying subsequent changes to maintain good adhesion and hospital costs with the necessary supplies.

An Italian study, through a systematic review, pointed out the lack of information about a specific time for changing the fixation with hypoallergenic tape and medical patches[19].In the case of this study, the date on the fixation device and on the patient's medical record was oriented, with a change every 24 hours when using tapes[4–6] and every 72 hours when using a commercial fixation device, or before, whenever it is loose, dirty, wet or with low adhesion.

With regard to health education actions, a low rate of adherence to participation of professionals was identified. The authors attribute this to the fact that the training is carried out during the same working hours and the increased workload resulting from the SARS-CoV-2 pandemic. It should be noted that the schedules were previously stipulated by the coordinations of the sectors, but without the availability of provision of other professionals for the participation of all employees. The lack of motivation of others is also considered, because, when they participate in the training, care activities accumulate in the already tedious work process.

Studies highlight contributing factors for non-adherence to health education actions, related to the need to maintain care, lack of human resources to replace participants, non-release from the head, little incentive and investment by managers, teaching methodologies that are not very interactive , professional lack of motivation, lack of obligation and dissemination of inefficient programming[21–23].

However, it was observed that the greater the adherence of professionals to participate in health education actions, the greater the success rate of the type of fixation standardized by the protocol.

Health education actions must be planned and executed in accordance with the institutional and professional reality, as a resource for discussions on care protocols and operational instructions between developers, validators and workers, directing the adoption of good practices, standardization of actions, improvement indicators, development of skills and abilities and decisions with better outcomes[24].

Regarding adherence to protocols, research carried out in Rio de Janeiro, Brazil, identified that the health team understands its importance as a guiding instrument for the execution of care procedures, providing safety to professionals and patients, however, it highlights difficulties and demotivation. The following are mentioned: little objectivity of the content, unattractive format, non-collective construction/preparation, poor dissemination, difficulty of access and impossibility of reading/consulting due to work overload[25].

It is noteworthy that a satisfactory result has not yet been reached regarding the adherence to the institutional protocol concerning the type of fixation and registration of the date of the procedure. A new approach to the theme is suggested to reaffirm the guidelines, attract a greater number of professionals and survey possible difficulties or reasons for low adherence, with subsequent measurement of the findings.

It is considered as limitations of the study the lack of data before the health education action to compare the findings and the non-specification of the input used in the fixation of the nasoenteral catheter.

CONCLUSION

The results made it possible to identify low adherence to the institutional protocol for fixation of nasoenteral catheters regarding the type of fixation and registration of the date of the procedure. Despite the unsatisfactory adherence, there was a high positive correlation between the professionals' adherence to the education actions and the correctness ratio of the type of fixation, confirming the possibility of behavior change and the adoption of good practices through health education. A new approach to the theme is needed to reaffirm the guidelines and survey difficulties or motivating factors for the nonconformities found. reafirmação das orientações e levantamento de dificuldades ou fatores motivadores às inconformidades encontradas.

AUTHORS' CONTRIBUTION

Conceptualization: Sé ACS and Pestana LC; **Methodology:** Sé ACS and Gonçalves RCS; **Research:** Sé ACS, Oliveira RCS, Trivino GS, Lobato IS and Medeiros FM; **Formal analysis:** Sé ACS and Gonçalves EF; **Writing – First version:** Sé ACS and Gonçalves RCS; **Writing – Reviewing & Editing:** Sé ACS, Tonini T and Figueiredo NMA.

DATA STATEMENT AVAILABILITY

All datasets were generated and analyzed in the current study.

FUNDING

Not applicable.

ACKNOWLEDGEMENTS

To nurses Ana Lúcia Reis, Ana Paula Daltro Leal de Paiva and Cleyde Bié Nagatsuka for their collaboration in health education actions in the study setting.

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