



## CHAT ABOUT GASTRIC CATHETERIZATION AS A TOOL FOR LEARNING IN PEDIATRIC AND NEONATAL NURSING<sup>1</sup>

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### ABSTRACT

**Objective:** To analyze the perception of nursing students about the educational chat about gastric catheterization in pediatric and neonatal nursing. **Method:** This is a retrospective documentary study with a quali-quantitative approach. The evaluations completed by 367 nursing graduate students from a public university in the interior of São Paulo were analyzed, after participating in the educational chat about gastric catheterization, from 2013 to 2022. Quantitative data were analyzed using descriptive statistics and, for analysis and categorization of written expressions, Bardin's Content Analysis was used. **Results:** Educational chat was considered an important activity for learning (86.6%) and practice (98.4%), generating in students the need for more chat sessions on other topics both in the health disciplines of children and adolescents and in other disciplines (80.6%). The students felt so motivated by the activity that they considered that the duration could be increased. **Conclusion:** The educational chat about gastric catheterization in the child reached the proposed objective, building knowledge collectively, assisting in the autonomy of students in the teaching-learning process, according to their perception.

**Keywords:** Pediatric Nursing. Neonatal Nursing. Nursing Education. Gastric Probes. ICT in Health.

### INTRODUCTION

The nursing care to the child and the newborn is complex, being recommended, for the teaching of this area in nursing courses, the adoption of teaching strategies and the evaluation that place the student as protagonist, actively participating in the process of knowledge construction and co-responsibility for their professional competence<sup>(1)</sup>.

In turn, gastric catheterization is a technique widely used in the context of neonatal and pediatric units, essential to meet the nutritional demands and to maintain the health of newborns (NB) and hospitalized children, especially preterm. However, there is a lack of scientific evidence to support the teaching of gastric

catheterization care in children and neonates<sup>(2)</sup>.

Currently, with globalization, technological advances and, more recently, the COVID-19 pandemic, has expanded the use of Digital Information and Communication Technologies (DICT) in nursing, either to assist the teaching-learning process learning in nurse training and health education of clientele and professionals, either in research and extension. Among the numerous DICT that can be used in the context of nursing education, there is the educational chat<sup>(3-4)</sup>.

The chat, widely used in the international educational context, and still incipient in the country, consists of a synchronous textual communication system that brings people together in a virtual place (chat room) to

<sup>1</sup>The manuscript originates from the dissertation "Chat in pediatrics and neonatal nursing learning: perception of students", presented to the Professional Master's Program in Technology and Innovation in Nursing at Escola de Enfermagem de Ribeirão Preto da Universidade de São Paulo (EERP/USP).

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promote interaction and disseminate information<sup>(5)</sup>.

The educational chat promotes the autonomy of the nursing student, who becomes protagonist in the process of knowledge construction and responsible for the management of their learning. In addition, this teaching strategy can rely on other tools (web cafe, forum and wiki)<sup>(6)</sup>. The educational chat in nursing should be organized so that the agenda to be discussed is clear and objective. Students should be aware of what is expected from them and the mediator should focus on the theme of the discussion to avoid dispersions. It is important to have the support of a monitor trained in the tool, which will assist in clarifying technical doubts<sup>(4)</sup>.

The face-to-face disciplines, which provide health contents of the neonate, child and adolescent in the context of hospitalization developed by the Ribeirão Preto Nursing School of the University of São Paulo (EERP/USP), have invested in educational technologies and active methodologies in support of the teaching-learning process, such as the Moodle Virtual Learning Environment (VLE), denominated in the institution as *e-Disciplinas*, and its tools, including educational chat. The chat developed in these disciplines has addressed the issue of gastric catheterization in pediatric and neonatal nursing as support for the discussion of texts and procedures.

Since educational chat is an interactive and innovative teaching tool with the potential to promote the exchange of experiences and student autonomy in the process of knowledge construction, this tool is believed to contribute to the learning of nursing students about gastric catheterization in children and newborns. It is worth noting that the literature points to the need for further studies on the theme of ICT in nursing education<sup>(4)</sup>.

Thus, this study aimed to analyze the perception of nursing students about the educational chat about gastric catheterization in pediatric and neonatal nursing.

## METHOD

This is a retrospective documentary study with a quali-quantitative approach. A secondary data source was used, in this case, the

evaluations completed by students of the Bachelor's Degree in Nursing and Bachelor's and Licentiate's Degree in Nursing of the EERP/USP, referring to the educational chat about gastric catheterization in pediatric and neonatal nursing.

Students should be enrolled in the disciplines ERM0303 Integral Care to Children and Adolescents - 150 hours and offered in the sixth semester of the Bachelor's Degree in Nursing - and ERM0309 Integral Care to Child and Adolescent Health - 120 hours and offered in the seventh semester of the Bachelor's and Licentiate's degree in Nursing. In these moments of the courses, the students have already studied disciplines that address the theme of gastric catheterization, theory and practice, in adults.

From 2010, the disciplines ERM0309 and ERM0303 began to use the TelEduc platform, with its numerous technological resources, among them, the educational chat. Until then, the content related to gastric catheterization in pediatric and neonatal nursing was diluted in the theoretical and practical classes of these disciplines, being adapted to the educational chat strategy, with the arrival of the platform. However, there were difficulties in the development of chats on this platform, which were unable to include the ten students in each session. From 2013, the disciplines migrated to the Moodle VLE of the University of São Paulo, called *e-Disciplinas* and, to identify new findings on the migration and to know the chat experiences in the new platform, the chat began to be evaluated.

The instrument "Chat Evaluation" was completed by students who participated in the chat about gastric catheterization, between January 2013 and November 2022, immediately after the activity, in the *e-Disciplinas* itself in which the disciplines are allocated. The platform was monitored, and the chat logs (accesses and speeches of the participants) available only to the responsible professors. In order to make better use of the activity, the enrolled students are divided into small groups, with one chat session per group. Each chat session occurred with the average participation of ten students and at least two facilitators, lasting 45 minutes. In the days preceding the chat sessions, all students enrolled in the discipline were invited to proceed

with the reading of texts on the theme gastric catheterization in pediatric and neonatal nursing.

The instrument used for evaluation was developed by the Teaching Area exclusively for this activity, based on instruments of evaluation of Distance Learning (DL) activity. The development of the instrument was guided by the steps that an educational chat session should have, the benefits for the teaching-learning process and the difficulties that may arise during the development of the activity. This is an evaluation instrument composed of nine closed questions: Does the topic covered help in my practice? Was the dynamics adequate? Did it have adequate duration for discussion of the proposed theme? Was the form of interaction adequate? Was the conduct of the discussions appropriate? Did the previous reading of the texts subsidize the discussion? Would you like to have experts on the subject to assist in the discussion? Does the chat strategy assist in learning? Would you like to have more Chat sessions on other subjects of interest in Pediatric and Neonatal Nursing? Such questions should be judged by students according to a Likert scale: (1) – strongly disagree; (2) - disagree; (3) - do not disagree or agree; (4) - agree; (5) – strongly agree. As an open question, the instrument also presented a field for "Observations", in which the student could describe their comments, criticisms and suggestions regarding the educational chat.

The quantitative variables - answers of the closed questions - were analyzed using descriptive statistics, with the presentation of absolute frequency and relative frequency, from tables. For the analysis and categorization of the expressions written by the students about the educational chat activity, Content Analysis was used<sup>(7)</sup>. First, the floating reading of the expressions written by the students who filled the instrument of "Chat Evaluation" was performed in the space for comments, suggestions and criticisms. Then, the process of categorization of written content through categories was carried out, grouping those that had contextual similarity. To maintain the confidentiality of the participants, the letter S was used to refer to the students, accompanied by a number to differentiate them, the letter P for

the professor responsible for conducting and mediation and the letter M for the monitor accompanying the activity.

The study was analyzed and approved by the Human Research Ethics Committee of the Nursing School of Ribeirão Preto, University of São Paulo (CEP-EERP/USP), under opinion n. 1.400.233 (CAAE n. 49669015.2.0000.5393) with exemption from the Informed Consent Form (ICF) for being a retrospective documentary research.

## RESULTS

The group of students of the Bachelor's and Licentiate's Degree in Nursing at EERP-USP, who entered between 2006-2015, was composed mainly by female students, coming from a public school, non-workers, with a predominance of the age group between 18 and 24 years and single marital status<sup>(8)</sup>.

At the end of each educational chat session, students were invited to answer the "Chat Evaluation" instrument. In the present study, 367 instruments were analyzed. The answers of the students, referring to the closed questions of the evaluation instrument, were analyzed quantitatively and will be presented in Table 1.

Most students believe that the activity of educational chat assists in the process of teaching learning (86.6%) and in practice (98.4%). They also believe that the dynamics (85.8%), the form of interaction (84.7%) and the conduct of discussions (91.8%) are adequate, and that the reading of the bibliography proposed in the discipline helps at the time of the activity (90.4%). However, most of the students (56.9%) feel the need for an expert in the subject who participated in the discussions and a different duration of time than proposed by the activity. Many students (80.6%) would also like to have other chats regarding other subjects related to pediatric and neonatal nursing.

Regarding the duration, the majority (72.2%) also considered to be adequate for the discussion of the proposed theme. However, 13.1% of the students believe that the duration of the activity is insufficient to discuss and solve doubts about the subject, and 14.7% have no formed opinion about it.

**Table 1.** Distribution of students' responses, according to items of the Gastric Catheterization Chat Evaluation Instrument 2013-2022. Ribeirão Preto, SP, Brazil, 2022

Item	Strongly Disagree		Disagree		Do not Disagree or Agree		Agree		Strongly Agree	
	<i>f</i>	%	<i>f</i>	%	<i>F</i>	%	<i>f</i>	%	<i>f</i>	%
1. The topic addressed helps my practice	2	0.5	1	0.3	3	0.8	43	11.7	318	86.7
2. The dynamics were adequate	3	0.8	19	5.2	30	8.2	132	35.9	183	49.9
3. Adequate duration for discussion of the proposed theme	9	2.5	39	10.6	54	14.7	144	39.2	121	33.0
4. The form of interaction was adequate	4	1.1	21	5.7	31	8.5	140	38.1	171	46.6
5. The conduction of the discussions was adequate	2	0.5	5	1.4	23	6.3	121	32.9	216	58.9
6. The previous reading of the texts subsidized the discussions	1	0.3	12	3.3	22	6.0	86	23.4	246	67.0
7. I would like to have subject matter experts to assist in the discussions	12	3.3	26	7.1	120	32.7	113	30.8	96	26.1
8. Chat strategy helps learning	5	1.4	20	5.5	24	6.5	118	32.1	200	54.5
9. I would like to have more chat sessions on other topics of interest to pediatric and neonatal nursing	16	4.4	16	4.4	39	10.6	93	25.3	203	55.3

The instrument "Chat Evaluation" also contained a space for them to express themselves in writing about the activity they participated in order to evaluate the proposed activity. Among the 367 instruments filled, 145 have written expressions. Floating reading of written expressions and categorical analysis of them were performed, thus, the themes derived from the activity of educational chat emerged and were grouped into six categories.

#### **Category A:** Educational chat and assistance in learning and practice

According to the referred by the students, educational chat is an activity that provides that learning is built in groups, in an informal, interactive and dynamic way, which facilitates the student to expose their knowledge and opinions and places the student as a trainer of their own knowledge. They also reported that the activity, along with the previous reading of the proposed texts, assists in the learning process and in practice both as future nurses and in the laboratories and internships offered in the disciplines.

Excellent tool. Fixes the content better after

reading the texts [...] (S2).

The chat shows a group construction learning and makes us share our doubts, and learning in a dynamic way (S18).

It is an activity that helps in practice, in the laboratories and in the practice scenarios (S80).

This chat allowed an excellent discussion on the subject, bringing aspects experienced in the practice scenario by the students. In addition, I considered it positive that we did not faithfully follow a single text, but that it was an open discussion, and with questions that led the student to think and reflect on care (S91).

#### **Category B:** Conducting the educational chat

The students express that the professor and monitor assisted in the proper conduct of the activity and thus contributed to the teaching-learning process. However, some students felt that the subject changed very quickly, resulting in lack of opportunity to express themselves, or even in some questions asked by students who were left unanswered.

I believe that the conductor acted to facilitate the teaching-learning process and guide the discussion, always pointing out the most

important issues to be discussed (S67).

Despite having to be very quick with the answers to be able to keep up, the group's interaction with P1 and M1 ensured that no one had any doubts and that was very satisfactory (S78).

[...] some questions asked by the students themselves were left unanswered. I believe that the chat was so focused on answering the professor's questions that those asked by students were overlooked (S98).

### **Category C: Need for more Chat sessions**

Within the expressions written by students, it can be seen that the activity of educational chat is useful and thought-provoking, since students referred at various times the need for more chat sessions with other topics both in the disciplines of child and adolescent health and in other disciplines offered during the courses of Bachelor's and Licentiate's Degree in Nursing and Bachelor's Degree in Nursing at EERP/USP.

The methodology used is excellent, I find it interesting to work on other topics (S6).

Too bad the discipline is short, as it would be very interesting to have more chats to talk about (S14).

In all disciplines, they should address this method, even to escape a little from what we already have throughout graduation with lectures (S19).

### **Category D: Adequate duration for discussion of the topic**

The chat sessions offered in the health disciplines of the child and adolescent last 45 minutes. According to what the students said about the duration of the educational chat activity, some students believe that the time could be longer so that they could have discussed in more depth the topics that arose during the chat session. However, a student reports that, despite the reduced time, the form of driving the chat provided that the discussion occurred satisfactorily, solving all the doubts that arose in the course of the activity.

I just think that the duration should be longer (S1).

Despite the reduced time, it was possible to

address all the topics we studied in the available texts (S7).

I believe the time was too short. And even so, it was a good experience and certainly very rich in knowledge (S15).

I believe that the time was insufficient (S136).

### **Category E: Number of participants and their interaction**

Educational chat sessions offered in the child and adolescent health disciplines hold up to 20 participants. However, they have been carried out with a maximum number of 10 participants. Some students express that the number of participants in the educational chat session could be lower, as it would be easier to follow the discussions and answers given throughout the activity. A student notes that limiting the number of participants can impair interaction in the chat session.

I found it difficult to keep up with the scrolling of messages from colleagues and I thought there were a lot of people in the chat, which made it difficult to keep up with each topic that came up (S3).

Limiting the number of people to enter the chat room may sometimes be bad depending on the student's interaction in the chat (S31).

I believe that reducing the number of students makes the chat more organized and more profitable (S35).

### **Category F: Need for an expert on the subject**

Among the written expressions, few students report that they would like to have an expert on the subject participating in the activity of educational chat, but emphasize that the figures of the professor and monitors supplement this need, solving the existing doubts.

As for the experts, I already see them in the person of the professors and nurses who help us every day (S20).

I really liked the chat, and I think it would be interesting, for the next sessions, specialists in the subjects, although I am sure that the professors and nurses who conducted it are great too (S50).

## **DISCUSSION**

Teaching in pediatric and neonatal nursing should be conducted dynamically, in order to encourage and instigate the student to seek knowledge and develop skills on relevant topics of child health<sup>(9)</sup>. Experiences with the development and use of digital technologies for pediatric and neonatal nursing teaching, such as educational video<sup>(10)</sup> and software<sup>(9)</sup>, capable of promoting interactive learning and meeting the demands of digital natives have already been described in the literature<sup>(9-10)</sup>.

The VLE can be considered a heuristic-formative tool that promotes the autonomy, reflection and criticism of the student. The platform has a number of resources, such as educational chat, which provide flexibility in learning management, stimulating the search for materials and content that add to student training<sup>(15)</sup>. However, the use of chat in nursing is still incipient. For example, in the Nursing graduate course of the Federal University of Rio Grande do Sul (UFRGS), educational chat is offered to discuss anamnesis and physical examination in nursing. Although few issues related to nursing are discussed through such activity, the use of chat as a teaching-learning strategy proved to be promising<sup>(4)</sup>.

This study showed that the educational chat promoted the collective construction of knowledge in a dynamic, interactive and collaborative way, in an informal environment in which students felt free to place themselves. Similarly, other successful experiences in remote education on specific nursing topics can be found in the literature, such as an online course developed for nursing students in Turkey on violence against children and women, that provided a significantly greater knowledge on the subject in its participants, compared to the control group students<sup>(16)</sup>.

Efforts have been made to promote patient safety in Neonatal Intensive Care Units. The construction of a safety culture involves the adoption of management strategies aimed, for example, at the prevention and management of errors that endanger the integrity of the newborn. Punitive measures have already been shown to be ineffective, on the other hand, education can contribute to safer care for newborns and their families<sup>(11)</sup>.

Errors related to the gastric catheterization technique in neonates, such as incorrect positioning of the tube, can generate complications such as gastrointestinal perforations that, in turn, can lead the newborn to death<sup>(12-13)</sup>. Unfortunately, most nursing professionals still develop the practice of gastric catheterization not complying with scientific recommendations, which indicate failures in the training and qualification process of nursing professionals working in the pediatric and neonatal areas<sup>(14)</sup>. Thus, the educational processes on gastric catheterization, especially in neonatology, need to be reviewed and improved, both in the nursing graduation and in specialization/residency courses and in permanent health education<sup>(14)</sup>.

By addressing topics such as proper measurement of the probe and tests to confirm its position, the educational chat for the teaching of gastric catheterization obtained satisfactory results, with possible implications for nursing care to be provided by future nurses. Most students agreed that the educational chat helped in the teaching-learning process about gastric catheterization, claiming that the activity provided the acquisition and fixation of new knowledge that could be applied both in skills laboratories and in real fields of practice.

Some possible weaknesses of the evaluated educational chat pointed out were: the duration time and the number of students per session.

As for the duration time, some students believe that the 45-minute time is not enough to further discuss the topics that arise during the chat session. The optimal duration time for an educational chat activity should be 60 minutes. However, if the mediator of the discussion or the students feel the need to prolong the activity for a few more minutes due to the productivity of the conversation, this time can be extended to a maximum of 90 minutes<sup>(17)</sup>. The evaluation of students, in addition to the literature, reveals that the recommendation would be to extend the duration of the educational chat of gastric catheterization to 60 minutes.

Regarding the number of participants, some students expressed that the number of participants in the educational chat session could be lower, claiming difficulty in following the discussions and answers given throughout the

activity. The difficulties experienced by these students are legitimized by literature, because, when there are several participants talking at the same time, interaction problems may occur, being one of the main challenges is the monitoring of the subject under discussion by students<sup>(5)</sup>. On the other hand, most students reported that the interaction between participants in the gastric catheterization chat was adequate during the activity. Moreover, one student noted that further reducing/limiting the number of participants could even impair interaction in the chat session.

The optimal number of participating students depends on the purpose of the educational chat. Nevertheless, there is a recommendation that the number of participants should not be greater than 10 to 15 students<sup>(4)</sup>. The educational chat sessions of the disciplines of Child and Adolescent Health of the institution occur with a maximum number of ten students, corroborating the recommendations of the literature.

In relation to the potential of the chat, according to the students, the following are highlighted: the texts available for prior reading, mediation, conduct and interaction of the chat.

From the evaluations made, the educational chat about gastric catheterization can be inserted in teaching in pediatric and neonatal nursing as an alternative to traditional methods already widely used, as lectures and laboratories for skills training. Distance learning moments in face-to-face nursing education are considered effective, especially when they are used in complementation to traditional teaching, favoring the construction and exchange of knowledge, as well as the autonomy of the student<sup>(18)</sup>. Chat also represents a way to add the benefits of digital technologies to active methodologies, such as flipped classroom.

The flipped classroom is a teaching method in which students perform tasks at home by online platform, as a way of preparing for subsequent activities, which contributes to an improvement in the performance of the nursing student<sup>(19)</sup>. In turn, the flexible and versatile nature of online activities allows them to be used as support tools in the teaching of various nursing contents, such as the health of children and adolescents. However, in order to be effective, online activity in nursing needs quality

content, in addition to an active teaching environment that favors interaction between students<sup>(18)</sup>. In this sense, the quality of the material/content available for prior reading, associated with the interactive and dynamic environment of educational chat, seems to have favored the teaching-learning process in gastric catheterization.

The DICT are part of a pedagogical innovation that has been happening in the field of health education, including nursing, constituting pedagogical practices that expand the space for the active participation of the student, when integrated with other active teaching methods<sup>(20)</sup>. Therefore, the use of the internet, VLE and DICT alone does not guarantee students' learning, especially in health and nursing courses, in which the face-to-face needs to be maintained throughout the course, but presents potential for some activities when based on active methodologies, planning, knowledge and skills by the facilitator professor, in his/her handling<sup>(18,20)</sup>.

The educational chat, for the teaching of other themes and nursing techniques, whether in the health of the child or in other areas, is not only possible but also recommended. This fact can be proven from the speeches of students, for which they expressed the desire for other chat sessions on other topics within pediatric nursing and even in other disciplines. However, the use of DICT in nursing education is still a challenge, considering the need to train professors for its proper use, which should add to teaching and not replace face-to-face experiences<sup>(3)</sup>.

## CONCLUSION

According to the students' perception, the educational chat about gastric catheterization in pediatric and neonatal nursing is a powerful teaching-learning strategy, emphasizing its dynamic and interactive character. The availability of texts for prior reading was considered a facilitator, as well as the mediation and the way the chat was conducted by professors and mediators. On the other hand, some students reported difficulty in following the discussion, answering questions and deepening knowledge.

The vast majority of students evaluated the

educational chat in a positive way, considering an activity that provides collaborative learning, with the collective construction of learning, in an informal and pleasant way, in addition to generating in students the need for more chat sessions with other topics.

The educational chat of gastric catheterization is important and motivating for

students' learning, assists in autonomy and care practice on the theme studied. More studies are necessary, with greater methodological rigor, to assess the effectiveness of educational chats in teaching pediatric and neonatal nursing, as well as other educational technologies for the teaching of gastric catheterization.

## CHAT SOBRE CATETERISMO GÁSTRICO COMO FERRAMENTA PARA A APRENDIZAGEM EM ENFERMAGEM PEDIÁTRICA E NEONATAL

### RESUMO

**Objetivo:** Analisar a percepção dos estudantes de enfermagem a respeito do *chat* educacional sobre cateterismo gástrico em enfermagem pediátrica e neonatal. **Método:** Trata-se de um estudo documental retrospectivo com abordagem quali-quantitativa. Foram analisadas as avaliações preenchidas por 367 estudantes de graduação em Enfermagem de uma universidade pública do interior de São Paulo, após participação no *chat* educacional sobre cateterismo gástrico, no período de 2013 a 2022. Os dados quantitativos foram analisados por meio de estatística descritiva e, para análise e categorização das expressões escritas, foi utilizada a Análise de Conteúdo de Bardin. **Resultados:** O *chat* educacional foi considerado uma atividade importante para o aprendizado (86,6%) e para a prática (98,4%), gerando no aluno a necessidade de mais sessões de *chat* sobre outros temas tanto nas disciplinas de saúde da criança e do adolescente quanto em outras disciplinas (80,6%). Os estudantes sentiram-se tão motivados com a atividade que consideraram que o tempo de duração poderia ser aumentado. **Conclusão:** Concluiu-se que o *chat* educacional sobre cateterismo gástrico na criança atingiu o objetivo proposto, construindo o conhecimento de forma coletiva, auxiliando na autonomia do estudante no processo de ensino-aprendizagem, segundo a percepção destes.

**Keywords:** Enfermagem Pediátrica. Enfermagem Neonatal. Educação em Enfermagem. Sondas Gástricas. TIC na Saúde.

## CHAT SOBRE CATETERISMO GÁSTRICO COMO HERRAMIENTA PARA EL APRENDIZAJE EN ENFERMERÍA PEDIÁTRICA Y NEONATAL

### RESUMEN

**Objetivo:** analizar la percepción de los estudiantes de enfermería respecto al chat educativo sobre cateterismo gástrico en enfermería pediátrica y neonatal. **Método:** se trata de un estudio documental retrospectivo con enfoque cuali-cuantitativo. Se analizaron las evaluaciones rellenas por 367 estudiantes de pregrado en Enfermería de una universidad pública del interior de São Paulo/Brasil, tras participación en el chat educativo sobre cateterismo gástrico, en el período de 2013 a 2022. Los datos cuantitativos fueron analizados por medio de estadística descriptiva y, para análisis y categorización de las expresiones escritas, fue utilizado el Análisis de Contenido de Bardin. **Resultados:** el chat educativo fue considerado una actividad importante para el aprendizaje (86,6%) y para la práctica (98,4%), generando en el alumno la necesidad de más sesiones de chat sobre otros temas tanto en las asignaturas de salud del niño y del adolescente como en otras asignaturas (80,6%). Los estudiantes se sintieron tan motivados por la actividad que consideraron que el tiempo de duración podría aumentarse. **Conclusión:** se concluyó que el chat educativo sobre cateterismo gástrico en el niño alcanzó el objetivo propuesto, construyendo el conocimiento de forma colectiva, auxiliando en la autonomía del estudiante en el proceso de enseñanza-aprendizaje, según su percepción.

**Palabras clave:** Enfermería Pediátrica. Enfermería Neonatal. Educación en Enfermería. Sondas Gástricas. TIC en Salud.

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**Submitted:** 02/12/2022

**Accepted:** 20/08/2023

### Financial support

This work was carried out with the support of the Coordination for the Improvement of Higher Education Personnel – Brazil (CAPES) – Financing Code 001.