

INCIDENCE OF GASTRIC EXTUBATION IN PEDIATRIC AND ADULT GROUPS IN A HOME CARE PROGRAM*

INCIDÊNCIA DE EXTUBAÇÃO GÁSTRICA NOS GRUPOS PEDIÁTRICO E ADULTO EM UM PROGRAMA DE ASSISTÊNCIA DOMICILIAR

INCIDENCIA DE LA EXTUBACIÓN GÁSTRICA EN LOS GRUPOS PEDIÁTRICO Y ADULTO EN EL PROGRAMA DE ATENCIÓN DOMICILIARIA

Larissa Kozloff Naves¹
Daisy Maria Rizatto Tronchin²
Marta Maria Melleiro²

* This article is part of the content of the master degree thesis "Evaluation of gastric intubation in users of a home care program in a university hospital", authored by Larissa Kozloff Naves, presented to EEU SP, São Paulo, December 2010.

¹ PhD student in Nursing. Graduate School Program in Management at the School of Nursing from São Paulo University. Coordinator of project and quality at the Public Partnerships from the Albert Einstein Brazilian Jewish Benevolent Society, São Paulo, SP – Brazil.

² Full Professor (Free Lecturer) at the Department of Professional Orientation at the School of Nursing from São Paulo University. São Paulo, SP – Brazil.

Corresponding Author: Larissa Kozloff Naves. E-mail: larinaves@usp.br

Submitted on: 09/12/2013

Approved on: 02/27/2014

ABSTRACT

The objective of this study was to evaluate the gastric intubation assistential practice for enteral nutrition of users of the pediatric and adult/elderly groups in the Home Care Program from a university hospital. This is exploratory-descriptive study with a quantitative approach, using descriptive statistics with test of significance at 5%, and calculation of indicators. The population was composed of 37 subjects; 81.1% being in the adult/elderly group. The age of caregivers showed statistically significant difference between the studied groups and were 35.1 years old (sd+7.6) in the pediatric group and 54.2 years old (sd+11.9) in the adult/elderly group. The incidence of unplanned extubation in the pediatric group was 1.05 and 0.73 in the adult/elderly group, with no statistically significant difference ($p = 0.28$) between the groups. However, all extubations in the pediatric group were unplanned. Home care is a field of knowledge to be exploited; the use of indicators allows the identification of actual and potential problems and implementation of effective actions to achieve quality in health. The analysis of gastric extubations measured through outcome indicators showed that the findings brought awareness to the reality of patients with gastric intubation, providing subsidies for the establishment of assistance and managerial goals for a continuous improvement in quality and the necessary reformulations of working procedures in the context of home care.

Keywords: Intubation, Gastrointestinal; Health Services Evaluation; Home Nursing; Nursing.

RESUMO

O objetivo deste estudo foi avaliar a prática assistencial da intubação gástrica para nutrição enteral dos usuários dos grupos pediátrico e adulto/idoso em um Programa de Assistência Domiciliar de um hospital universitário. Trata-se de estudo exploratório-descritivo, de abordagem quantitativa, adotando-se estatística descritiva, teste de significância de 5% e cálculo de indicadores. A população foi composta de 37 sujeitos sendo 81,1% do grupo adulto/idoso. Em relação à idade do cuidador, no grupo pediátrico a média foi de 35,1 anos (dp+7,6) e no grupo adulto/idoso 54,2 anos (dp+11,9), havendo diferença estatisticamente significativa ($p=0,00$). A incidência de extubação não planejada no grupo pediátrico foi de 1,05 e no adulto/idoso 0,73, não havendo diferença estatística significativa ($p=0,28$) entre os grupos. Porém, todas as extubações do grupo pediátrico foram não planejadas. A atenção domiciliar é um campo do conhecimento a ser explorado e o emprego de indicadores permite identificar problemas reais e potenciais, visando implementar ações efetivas para o alcance da qualidade em saúde. No tocante às extubações gástricas mensuradas por meio de indicadores de resultado, verificou-se que os achados permitiram conhecer a realidade dos portadores de intubação gástrica, fornecendo subsídios para o estabelecimento de metas assistenciais e gerenciais para a melhoria contínua da qualidade e as reformulações necessárias dos processos de trabalho no âmbito da assistência domiciliar.

Palavras-chave: Intubação Gastrointestinal; Avaliação de Serviços de Saúde; Assistência Domiciliar; Enfermagem.

RESUMEN

El objetivo de este estudio fue evaluar la práctica asistencial de intubación gástrica para nutrición enteral de usuarios de los grupos pediátrico y adulto/anciano en el programa de atención domiciliar de un hospital universitario. Se trata de un estudio exploratorio descriptivo, de enfoque cuantitativo con estadística descriptiva, prueba de significancia del 5% y cálculo de indicadores. La muestra constó de 37 sujetos de los cuales el 81,1% pertenecía al grupo adulto/anciano. Con respecto a la edad del cuidador en el grupo pediátrico el promedio fue de 35,1 años (dp+7,6) y en el grupo adulto/anciano de 54,2 años (dp+11,9), con diferencia estadística significativa ($p=0,00$). La incidencia de extubación no planeada en el

grupo pediátrico fue de 1,05 y en el adulto/anciano de 0,73, sin diferencia estadística significativa ($p=0,28$) entre los grupos. Sin embargo, todas las extubaciones del grupo pediátrico fueron no planeadas. La atención domiciliaria constituye un campo de conocimiento por explorar y el empleo de indicadores permite identificar problemas reales y potenciales con miras a implementar acciones efectivas para lograr calidad en la salud. Con respecto a las extubaciones gástricas medidas a través de indicadores de resultado, se constató que los resultados permitieron conocer la realidad de los pacientes con intubación gástrica, aportando datos para establecer metas asistenciales y gerenciales para la mejora continua de la calidad y la reformulación necesaria de los procesos de trabajo dentro del contexto de la atención domiciliaria.

Palabras clave: Intubación Gastrointestinal; Evaluación de Servicios de Salud; Atención Domiciliaria de Salud; Enfermería

INTRODUCTION

Home Care (HC) is seen as a worldwide trend in care services and understood as a strategy of health organizations to relocate costs and adapt to the needs of patients with chronic degenerative diseases and the aging population.

According to Ordinance No. 2,029, from August 24, 2011¹, in Brazil, home care is a new modality of health care substitutive or complementary to the existing one, characterized by a set of actions for health promotion, disease prevention and treatment, and rehabilitation provided at home, with guaranteed continuity of care and integrated to the health care networks.

The planning of home care is based on users' case clinical complexity and their need for care. After a hospital evaluation and indication of a caregiver, with or without family ties, the Home Care Plan is determined consisting of a document, which includes a set of measures, guiding actions for all professionals directly and/or indirectly involved in assisting the user in his home, from admission to discharge.²

In view of the increasing demand for this service and the institution of a national policy that covers home care, the inclusion of a practice of quality monitoring in the HC is necessary to follow and propose improvements in the assistance provided to users of this service.

The evaluation of service quality and patient safety can be performed through the use of indicators of structure, process, and results based on the donabedian's evaluative model³ that allow evidencing the performance of professional practice. Furthermore, the continuous monitoring of these indicators promotes understanding the user's satisfaction, cost-benefit analysis, cost-effectiveness of the therapeutics, and clinical outcomes for a given health condition.

Thus, the search for quality becomes a technical and social imperative regardless of the legal nature of the institution and is fundamental to the construction and establishment of criteria and mechanisms to assess and monitor the quality of assistance.⁴

The enteral nutrition therapy (ENT) is among the therapies employed in the home environment and corresponds to the administration of oral products to supplement or replace the oral ingestion of nutrients.

In Brazil, a study conducted in the Federal District in 2005, report the incidence of TNE users as 14798 cases/million of in-

habitants/year and the prevalence of 176.09 cases/million inhabitants.⁵ However, there are no investigations that reflect this prevalence and incidence of home enteral nutrition (HEN) that allow comparison between states within the national territory.

Currently, home nutritional support has provided successful treatment of individuals with infirmities who would otherwise need prolonged or repeated hospitalizations for the correction of nutritional changes.

The analysis of the world scenario, especially in developed countries, shows a growing trend toward the adoption of this form of nutritional treatment, emphasizing its importance in ensuring improved quality of life for patients and humanization of assistance in addition to increasing the number of beds available in hospitals and, consequently, reduction of health costs.⁶

Enteral nutrition is considered safe and effective. However, in the United States, recent studies from the National Patient Safety Agency (NPSA) warn about complications of gastric intubation resulting from the use of enteral probes, leading health professionals to review their practices and guidelines that permeate the enteral nutrition (EN).⁷

Thus, gastric intubation at home is an assistive practice designed for nutritional supply and administration of medicines, implying installation, maintenance and stability of probes, diet and medicine administration, and training of caregivers or patients for therapeutic success.

Enteral accesses are classified as short-term accesses and are introduced via nasal or oral routes with duration of less than six weeks, or longer-term as those of percutaneous or surgical implantation – gastrostomy.

All users of nutritional therapy (NT) should be monitored periodically during therapy; this objective evaluation ensures access to the best that the therapy can offer resulting in low-cost clinical recovery.⁸ In addition, the loss of the gastric probe exposes the patient to unnecessary risks, such as pulmonary aspiration, discomfort and pain due to re-intubations, and increase in material consumption. Such assumptions confront the establishment of quality management for TN users.

The Diretrizes Project,⁸ which provides diagnostic and therapeutic guidelines and where applicable, preventive guidelines based on scientific evidence, published a document that guides quality management for NT users, proposing the use of proto-

cols, general indicators of effectiveness, and results for service quality and patient safety. The measurement of the incidence of loss of gastric probes is among the proposed indicators.

Extending the Diretrizes Project recommendations⁸, it is understood that gastric extubations, i.e. losses of nasogastric or gastrostomy probes, can be considered as health evaluation measures, especially because they generate assistance and managerial indicators. However, it is observed that there are few studies in the literature monitoring the proportion, an incidence rate, and reasons or circumstances involved in this event. The studies that report this event only evaluate unplanned extubations.

Therefore, considering: the repercussions that the unplanned extubations cause in the users' state of health, patient safety, and quality of HC; the gaps in the literature reporting on HC quality; the application of result indicators as elements that keep a close relationship with the healthcare quality assessment, this study aims to characterize the population of users who underwent gastric intubation at home and compare the incidence and classification of extubations among users of pediatric and adult/elderly groups.

METHODOLOGY

This is an exploratory-descriptive study with a quantitative approach and prospective data collection. The study site was the Home Care Program (HCP) from a university hospital in the city of São Paulo. The target population was constituted by users undergoing gastric intubation for NED. Thereby, 37 users were involved in the study, seven in the pediatric group and 30 in the adult/elderly group, between April and August of 2010. These subjects were already part of the PAD or were admitted throughout the data collection period. The exclusion criteria were defined by cases that evolved to death within the first 24 hours after admission to the PAD, or those who presented altered feeding routes (evolution to feeding by mouth).

The users in the pediatric group were children aged from zero to 12 incomplete years old and adolescents from 12 to 18 years old.⁹ The adult/elderly group was composed of the subjects aged between 18 to 59 incomplete years old (adults) and ≥ 60 years old (elderly).¹⁰

The study was submitted to the Department of Nursing and the Committee of Ethics in Research from the HU-USP and approved under the 986/10 protocol and SISNEP 0013.0.198.000 CAAE-10. A Volunteer Informed Consent was not required from the study's participants because the "gastric extubation" event is collected systematically, as well as events of a fall, pressure ulcers, and loss of catheters. These events are tracked as assistance indicators and used as a management tool. This is a management practice that does not involve direct or indirect approach or intervention with humans, but

rather the recording of an event routinely collected by the institution. Therefore, there was no need of TCLE in this study.

The selection the subjects who were eligible for inclusion in the study was based on their electronic medical charts as users of the PAD that indicate the use of gastric intubation for EN. The survey on the users charts included data collection using the instrument "Form 1" filled by the researcher using the documents: "Patient History" and "Nursing Evolution" contained in the charts. The data for the second part of data collection were recorded by the researcher or nurses after the occurrence of the event. Annotations and nursing developments were also used, especially to confirm the circumstances involved at the time of extubations. Form 2 was filled by the researcher using the sum of the total patient-day-intubation at the end of each month.

The collection instrument was developed specifically for this study and underwent a pre-test, which showed no need for changes. It consisted of a form divided into two parts; part I consisting of socio-demographic and clinical data and technical information about the procedure, and included the following variables: gender, age, the first three user's admission diagnoses, secondary diagnoses, caregiver (gender, age, family member or not, degree of relationship to the patient, and schooling), date of probe insertion under evaluation, insertion route, type of diet, end of treatment (date and reason), and medications continuously administered via probe. Part II contained a chart intended to register the date and time of probe loss and causes (selective position, obstruction, ruptured balloon, material deterioration, removed by the patient, by the caregiver, probe displacement during the procedure or elective). In the case of removal during the procedure, the circumstances involved were recorded, for example, diet infusion and bath. A second form was developed for monitoring the registration of gastric tube carrier patient/day with the goal of measuring the number of intubated patient/day and calculating the incidence of gastric extubation.

The obtained data were organized in spreadsheets developed in the Microsoft Excel® 2003 program and later processed by statistical analysis in the Statistic Package for Social Sciences (SPSS)® version 18.0, both in the Windows environment. Relative and absolute frequencies were used for the qualitative variables. Averages and medians, standard deviations, and minimum and maximum amplitude were used for the quantitative variables to analyze data variability. The Student's T test (T) and Chi-square were used to compare averages of quantitative variables between the two groups (pediatric and adult/elderly). The significance level adopted was 5% and p values $< p 0.05$. The length of time for usage of probes was analyzed with the Kaplan-Meier method, and the comparison of survival curves was tested with the log rank test.

The incidence of gastric extubation was calculated using the assistance results indicators, which are expressed through a mathematical equation in which the numerator represents the event being measured (gastric extubation or probe removal) and the denominator represents population of risk or under evaluation (intubated patient/day) multiplied by 100.¹¹⁻¹³

The extubations were classified as:

- **planned extubation:** characterized by the end of therapy, elective probe replacement (according to the protocol and at every six months), or alteration in the intubation route (from nasogastric to gastrostomy).
- **unplanned extubation:** characterized by probe removal due to a ruptured balloon, obstruction, material deterioration, selective position, or probe removal by the patient, healthcare professional, or caregiver.

RESULTS AND DISCUSSION

The HC consolidates its activities from the demands of health services and users in reducing the length of hospital stay, number of readmissions, costs, humanization of care, and improvements in the patient's quality of life.

According to each institution's protocol and in compliance to Ordinance 2.209 from August 24, 2011¹, the indication of a caregiver is necessary for the provision of this service, being the caregiver defined as a "person with or without family ties, able to assist the patient in his needs and activities of everyday life".

Table 1 depicts the characterization of the subjects participating in the study.

HEN is indicated for individuals in all age groups. In this study, we examined the relationships between the pediatric and adult/elderly groups to define differences and peculiarities of each group.

The distribution of users in the pediatric and adult/elderly groups was: out of the 37 users, 30 (81.1%) belonged to the adult/elderly group. In the pediatric group, four (57.1%) were females; in the adult/elderly group, the gender distribution was uniform (50%). The analysis of these variables through the Fisher's test showed no statistically significant difference between the groups ($p = 0.532$).

In a study conducted in the Federal District, the distribution between groups was 45.9% pediatric and 54.1% adult/elderly patients, and no statistically significant difference was observed in gender distribution ($p = 0.179$).⁵

In the research assessing HEN in pediatric users, 60% of the studied group was composed by females, corroborating the findings of this research.⁶

In relation to the admission diagnosis, 73% of the studied population showed neurological disorders and 21.6% genetic diseases. In a similar study in England, 48% of the subjects reported neurological diagnosis, followed by 36% with oncology diagnoses.¹⁴

Table 1 - Distribution of users in the pediatric and adult/elderly groups according to the variables gender, age group, diagnosis of admission, secondary diagnosis, and caregiver profile – São Paulo, 2010

Variables	Pediatric		Adult/Elderly	
	N=7	%	N=30	%
User profile				
Gender				
Female	4	57,1	15	50
Male	3	42,9	15	50
Admission diagnosis *				
Stroke	0	0	12	40
Unspecified dementia	0	0	10	33,3
Traumatic brain injury	0	0	3	10
Cerebral palsy	1	14,2	2	6,7
Werdnig-Hoffmann disease	2	28,6	0	0
West syndrome	2	28,6	0	0
Malignant neoplasms	0	0	2	6,7
Chromosomal anomalies	2	28,6	0	0
Immunodeficiency virus disease	0	0	1	3,3
Caregiver profile				
Gender				
Female	7	100	26	86,7
Male	0	0	4	13,3
Age group (years)				
18 I--I 60	7	100	20	66,7
≥ 60 years	0	0	10	33,3
Relationship to patient				
Family	7	100	29	96,7
Not family	0	0	1	3,3
Relationship degree*				
Mother	7	100	3	10,3
Wife (the)	0	0	9	31
Daughter (the)	0	0	8	27,6
Sister (the)	0	0	2	6,9
Other degrees	0	0	7	24,1
Education **				
Incomplete Middle School	3	42,8	10	33,3
Complete Middle School	0	0	6	20
Complete High school	2	28,6	4	13,3
Incomplete High school	2	28,6	2	6,7
Complete college education	0	0	2	6,7
Incomplete college education	0	0	1	3,3

* One caregiver had no family ties ** 5 caregivers did not report the degree of schooling.

Source: prepared by the authors, based on the research data.

The caregiver age variable in both groups showed averages of 35.1 years (sd±7.6) in the pediatric group and 54.2 years (sd±11.9) in the adult/elderly group; the Student's t test showed no statistically significant difference between the groups (p = 0.00).

All caregivers in the pediatric group (100%) were mothers. In the adult/elderly group, most of the caregivers were spouses or children, females, with incomplete basic education coinciding with the findings of a study conducted in Spain in a group of caregivers of the elderly.¹⁵

In this respect, the caregivers in the pediatric group are younger than those in the adult/elderly group and remain longer in the HCP because of the survival rates in the pediatric group.

The length of time in the HCP corresponded to the averages of 24.5 (sd±12.4) months in the pediatric group and seven (sd ±9.7) months in the adult/elderly group; statistically significant difference was observed between the two groups (p = 0.00).

Child survival is significant and is increasing in response to improvements in the quality of life standards, advances in nutrition, and preventive sanitation measures; this survival is even accentuated as modern public health resources become more available. Even if all age groups were benefited from the change in disease patterns and increasing life expectancy, the infant mortality decline is certainly the greatest, especially in the group aged between 1 and 4 years old.¹⁶

As verified in the literature, the gastric intubation for enteral nutrition in HC is a procedure that guarantees the passage of food into the stomach via a nasogastric or gastrostomy probe. The length of use of these probes is variable because it is determined based on assistance protocols particular to each health service or is dependent on the complications that lead to its removal.

In this study, the total sum of days of intubation corresponded to 2,676 days, 745 in the first month, 666 in the second, 632 in the third, and 633 in the fourth month.

In the pediatric group, the total number of intubation days was 760; 208 in the first month, 186 in the second, 180 in the third, and 186 in the fourth. In the adult/elderly group, the total number of intubation days was 1,916 days; 537 in the first, 480 in the second, 452 in the third, and 447 in the fourth month.

The predominance in the use of gastrostomy probe was observed (51.4%). This finding is consistent with data from the majority of European countries, except in Spain, in which gastrostomy is used by 25% of the population that receives nutritional support through a enteral route.¹⁷

In a study conducted in England, 78% of the patients received diet via gastrostomy.¹⁸ In Brazil, another study showed that 61.8% of the patients received enteral diet at home, via a nasogastric probe.⁵

In Spain, a study conducted in the pediatric population in HEN showed that 64% used nasogastric probes and 34%

used gastrostomy probes; 28.23% of the diagnoses were for neurological diseases.¹⁹

Therefore, the variability in relation to the choice of intubation route for HEN is observed and based on the dependence on the patient's clinical condition and availability of resources in the service and of relatives/users.

As for the route of insertion, i.e. nasogastric and gastrostomy, gastrostomy was used in 100% of patients in the pediatric group. Most of the patients in the adult/elderly group, 18 (60%), used the nasogastric route.

One can infer that the findings in the present study are in agreement with the literature, with special attention to the 100% of children/adolescents who used gastrostomy.

Probe substitutions were observed during the collection period in 18 users; five of them in the pediatric group. Probes were replaced twice in 60% of patients in the pediatric group and 30.7% in the adult/elderly group. All users who replaced the probe three times were in the adult/elderly group. This result can be correlated to via of insertion, age, and clinical diagnoses in this group, reported in the preceding table.

The average of probe substitutions during the collection period was 1.6 time in both groups. The Student's T test (p = 0.968) showed no statistically significant difference between the groups.

The results in Table 2 showed that most of the extubations, in both groups, were unplanned. This percentage was 14 (48.2%) in the adult/elderly group and eight (27.7%) in the pediatric group. There were no planned extubation (substitution based on an established protocol, change of route, or end of therapy) in the pediatric group.

Table 2 - Distribution of extubation type – planned and unplanned – in the pediatric and adult/elderly groups – São Paulo, 2010

Type of extubation	Pediatric		Adult/Elderly		Total	
	N	%	N	%	N	%
Planned	0	0	7	24,1	7	24,1
Unplanned	8	27,7	14	48,2	22	75,9
Total	8	27,7	21	72,3	29	100

Source: prepared by the authors, based on the research data.

A study in Greece found that the most frequent complication from extubations was inadvertent (unplanned) (45.1%), i.e. caused by material damage/probe occlusion,²⁰ which are different from the data collected in this study (75.9%), for both groups.

Table 3 shows the incidence of extubation according to type and group, in each of the collection months

Table 3 results show that eight unplanned extubations occurred in the pediatric group, in 760 patients-day. The first month presented the highest incidence, 1.92 of extubations/100 patients-day; the second month showed the smallest incidence.

Table 3 - Incidence by month and type of extubation in the pediatric and adult/elderly group users – São Paulo, 2010

Month	Tipo			
	Pediatric group (n = 8)		Adult/Elderly group (N = 21)	
	Planned (n = 0)	Unplanned (n = 8)	Planned (n = 7)	Unplanned (n = 14)
1	0	1,92	0,18	1,11
2	0	0	0,2	0,83
3	0	1,66	1,1	0,66
4	0	0,53	0	0,22

Source: prepared by the authors, based on the research data.

In the adult/elderly group, in which 21 extubations occurred in 1,916 intubated patients-day, the general incidence was 1.09; 0.73 unplanned and 0.36 planned. The fourth month showed the lowest incidence of unplanned extubations and the first month showed the highest.

The reason for unplanned extubations was balloon disruption in 100% in the pediatric group; in the adult/elderly group, 6 (42.8%), out of the 14 extubations, were caused by probe removal by the patient himself, two (14.3%) by removal by the caregiver, two (14.3%) by balloon rupture, two (14.3%) by selective probe position, one (7.1%) by probe obstruction, and one (7.1%) by material deterioration.

The highest incident reason for probe removal – “balloon rupture” – requires the evaluation of aspects that involve the material type and brand, handling by the caregiver, patient’s psychomotor agitation, maintenance of periodic training, evaluation of practice programs, and learning on the part of the caregiver. In regards to the reasons for probe removal by the user in the adult/elderly group, the following aspects should be considered: probe setting and clinical state of the patient based on guidelines provided to caregivers/family members to minimize complications arising in this type of extubation.

Figure 1 presents survival curves, i.e. the length of time until extubation, planned or unplanned, of gastric probe use in the pediatric and adult/elderly groups, in months.

In the first month, the likelihood of probe permanence in the pediatric group was 92.9%. In the adult/elderly group, this percentage was 75.1%; this percentage in the fourth month was 49.2% in the pediatric group and 54.5% in the adult/elderly group. No statistically significant difference was observed in survival curves between the pediatric and adult/elderly groups ($p = 0.981$).

In the first month, pediatric users remained with the gastrostomy probe for longer periods compared to users in the adult/elderly group; this length of time declined over time.

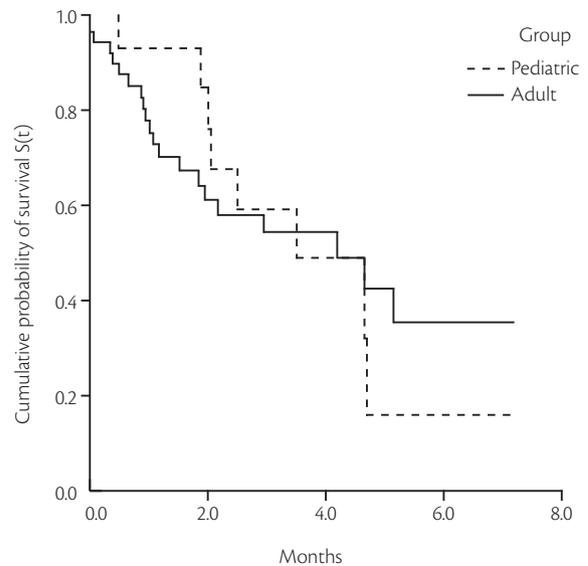


Figure 1 - Survival curves: length of use of gastric probes in the pediatric and adult/elderly groups – São Paulo, 2010. * $p = 0.981$ (Chi square).

FINAL CONSIDERATIONS

The outlining of users and caregivers’ profiles showed that this research is in line with findings from the literature represented by the expansion of HC services, especially for the elderly or children and adolescents in need of this technology.

It is noteworthy that the caregivers’ profile, belonging to the group of informal caregivers, was represented by the female figures of mothers, daughters, granddaughters, or sisters-in-law. In this perspective, we ratify that the family constitutes one of the pillars of support for home care and needs help from health professionals to share problems, successes, failures in the care, and health equipment available for this type of assistance.

According to the Collegiate Board Resolution 63/2000 approved by ANVISA, which sanctions the Technical Regulation to secure the minimum requirements needed for the Enteral Nutrition Therapy, guidance provided to patients, family members, or legal guardians by nurses on the use and control of TNE²¹ was established as one of the general competencies of nurses. Therefore, the importance of nurses in the HCP is emphasized, given the relevance of their roles and presence in every stage of assistance to users’ in HEN, influencing both therapeutic success and satisfaction of users and their families.

However, the need to establish partnerships with teams of health care professionals, such as the doctors, nutritionists, and audiologists, directly involved in the care of the user receiving enteral nutrition via gastric probe is recognized.

In a study conducted in England¹⁴ and another in Spain,¹⁹ the importance of planning and training care procedures

through the adoption of measures such as transferring the patient to his home and formation of a support group for patients with HEN is highlighted.

The characteristics and peculiarities of each group observed that all extubations were unplanned in the pediatric group, which indicate actions to strengthen the caregiver's education about probe handling, examining the type of medication used, and verifying the type of material.

The extubation rates indicated that this procedure should be followed up for longer periods of time (limited to four months in this study), which will allow the construction of a historical series, deepening the knowledge and monitoring the quality of care provided to users in the home environment. This information could support the decision-making processes in the assistance and managerial contexts, including the establishment of goals for continuous assistance improvement.

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