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Profile of children hospitalizations by primary care sensitive conditions

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ABSTRACT. Hospitalization for primary care sensitive conditions is a type of hospitalization that may be reduced or avoided if conditions are properly and effectively diagnosed and treated within Primary Health Care. To identify Brazilian rates of morbidity in 0 – 4 year-old children and hospitalization rates for primary care sensitive conditions rates in a pediatric unit of a public hospital in Cascavel, Paraná State, Brazil. Quantitative research whose data were retrieved from the Hospital Information System database - Datasus and from the records of the Medical and Statistical File Service of the hospital, with regard to hospital records of 220 children between January and December 2012, with an instrument specifically developed for research and analysis in descriptive statistics. National hospitalization rates for primary care sensitive conditions were predominant in children under one year and in the northern (657.56) and southern (621.18) regions, underscoring pneumonia. They accounted for 23.30% of hospitalizations, with 15.03% for respiratory diseases in the medical institution under analysis. Respiratory diseases were the main cause of hospitalization for primary care sensitive conditions and in children under one year old. Results suggest an increase in investment for prevention of these diseases in primary health care.

Keywords: hospitalization, morbidity, children, primary health care.

Perfil de hospitalizações de crianças por condições sensíveis à atenção primária

RESUMO. As internações por condições sensíveis à atenção primária são aquelas passíveis de redução e/ou evitáveis se forem corretamente e efetivamente diagnosticadas e tratadas no âmbito da Atenção Primária à Saúde. Identificar as taxas nacionais de morbidade hospitalar de crianças de zero a quatro anos, e as taxas de internações por condições sensíveis à atenção primária em unidade de pediatria de hospital público em Cascavel, PR. Pesquisa quantitativa, com dados obtidos no banco de dados do Sistema de Informações Hospitalares - Datasus e nos registros do Serviço de Arquivo Médico e Estatístico do hospital, em prontuários de 220 crianças, no período de janeiro a dezembro de 2012, por meio de instrumento desenvolvido especificamente para a pesquisa e análise estatística descritiva. A taxa de internações por condições sensíveis à atenção primária nacional foi proeminente em menores de um ano e nas regiões Norte (657,56) e Sul (621,18), predominando a pneumonia como causa. Na instituição do estudo, representaram 23,30% das hospitalizações, sendo 15,03% por doenças respiratórias. As doenças respiratórias figuram como causa principal de internações por condições sensíveis à atenção primária e em crianças menores de um ano, indicando maior investimento em sua prevenção na atenção primária.

Palavras-chave: hospitalização, morbidade, criança, atenção primária à saúde.

Introduction

Primary Health Care (PHC) is the gateway to the health system and first level of assistance since it caters for the needs of every person and is integrating with other levels of assistance (Brasil, 2011). Its attributes are accessibility to the service within a first contact, regular care associated to personal relationships between professionals and patients (longitudinality), access to all forms of health care (integrality) and continuity of assistance in the care network (coordination), coupled to the

focus on family and community orientation (Starfield, 2002). The latter two attributes characterize the Family Health Strategy.

In fact, PHC covers health promotion and disease prevention through constant care. It is related to a set of diagnostics and interventions in which hospitalizations could be avoided by appropriate primary care (Starfield, 2002). Failure at this level of attention compromises the resolution of other levels and affects the entire health system (Boing et al., 2012).

The admissions for Primary Care Sensitive Conditions (PCSC) are defined as a set of diseases that, if addressed appropriately in terms of promotion and prevention, such as early treatment and outpatient follow-up, would not require hospitalization (Pereira, Silva, & Lima Neto, 2014).

PCSC analysis identifies the most frequent causes of hospitalizations and whether the diseases are avoidable. It reveals the extent of primary care provided by the municipalities and whether it fulfilled its purpose. Thus, admissions are related to PHC offered to the population and its impact on other health care levels (Pereira et al, 2014).

Hospitalization rates are important to identify the causes for admission to hospital. According to data provided by the Ministry of Health (Datusus, 2013) for the group of children under one year old, the most common cause of hospitalization in the 2010-2012 period comprised conditions originated within the perinatal period (36.2%), followed by respiratory diseases (32.36%), some infectious and parasitic diseases (14.28%), digestive diseases (3.14%), congenital malformations and chromosomal abnormalities (2.9%), genital-urinary diseases (2.27%), endocrine, nutritional and metabolic diseases (1.59%), nervous system diseases (1.33%) and others (5.88%).

Since PCSC rates indicate primary care quality offered by a municipality, it may be inferred that the non-provision of adequate assistance in PHC services worsens the disease and the need for assistance. It makes clients requires further health care with greater technological density, increasing system costs, with more difficult solutions (Oliveira, Viera, Furtado, Mello, & Lima, 2012).

Current study identifies the national rates of morbidity of children within the 0 - 4 years old bracket, coupled to the hospitalization rates for primary care sensitive conditions in a pediatric unit of a public hospital in Cascavel, Paraná State, Brazil.

Material and methods

A quantitative study was undertaken to identify hospital admissions within a one-year period, from January 1 to December 31, 2012, retrieved from the Datusus database of the Hospitalizations Information System. Further, data on the hospitalizations of children less than one year old were also collected at the Medical and Statistical File Service of a university public hospital in Cascavel, Paraná State, Brazil.

The study was conducted with a sample estimated by G Power program, with medium effect size 0.3; error 0.05; and significance 0.95. It comprised 220 records, including 140 on children less than one year old and 80 on children between 1 – 9 years old. A systematic sampling technique was employed to choose the records for the sample, or rather, a medical record was selected every eighth one within the admission list. Data collection was performed by means of the data acquisition form, designed for this research.

PCSC selection was based on the list published by the Brazilian Ministry of Health, complying with Law SAS/MS 221 of April 17, 2008. The list covers 19 cause groups, with 74 diagnoses classified according to the Tenth Revision of the International Classification of Diseases - ICD10 (Nedel, Facchini, Martín-Mateo, Vieira, & Thumé, 2008; Brasil, 2008).

The quantitative analysis was performed with descriptive statistics while data were presented in tables for later comparison with the available literature on the theme. Research was conducted according to current ethical norms and the project was approved (Protocol 558.408) by the Ethics Committee of the Universidade Estadual do Oeste do Paraná (Unioeste), Cascavel, Paraná State, Brazil.

Results and discussion

Table 1 shows data on hospital admission rates for selected causes, obtained from the Datusus system.

The table reveals the relevance of the data on the cause of hospitalization for pneumonia in the two age groups, albeit with greater prevalence in children under one year old. There was a predominance of hospitalization rates for pneumonia in the northern and southern regions, for both ages, in 2012. In the case of PCSC, there was a higher occurrence in children under one year old in the northern and southern regions, and in 1 – 4 year-old children also in the northeastern region.

There was a sharper rate in 1 – 4 year-old children with regard to hospitalizations for cancer, and for both age groups in the southeastern region. As a cause of hospitalization, diabetes was predominant in 1 – 4 year-old children. However, rates for the regions varied, with the southeast region as the most significant in the 1 – 4 year-old age group and in children under one year in the northeastern region.

Table 1. Main causes of morbidity by regions of Brazil, in the hospitalization of 0-4 year-old children, in 2012. Cascavel, Paraná State, Brazil, 2014.

Main causes of hospitalization by Regions	Age Group	North		Northeast		Southeast		South		Center West		Total	
		N	HR	N	HR	N	HR	N	HR	N	HR	N	HR
Neoplasms	< 1 y	86	2.76	404	4.85	507	4.86	279	7.77	112	5.17	1388	5.02
	1-4 y	542	4.2	3027	8.73	3991	9.45	1872	13.11	925	10.58	10357	9.18
Diabetes	< 1 y	21	0.67	107	1.29	101	0.97	48	1.34	28	1.29	305	1.1
	1-4 y	34	0.26	222	0.64	326	0.77	94	0.66	80	0.91	756	0.67
Hypertension	< 1 y	32	1.03	103	1.24	60	0.58	14	0.39	19	0.88	228	0.83
	1-4 y	33	0.26	80	0.23	39	0.09	26	0.18	16	0.18	194	0.17
Ischemic Heart Disease	< 1 y	13	0.42	43	0.52	56	0.54	16	0.45	16	0.74	144	0.52
	1-4 y	2	0.02	6	0.02	15	0.04	3	0.02	11	0.13	37	0.03
Other Cerebrovascular Diseases	< 1 y	2	0.06	9	0.11	24	0.23	4	0.11	5	0.23	44	0.16
	1-4 y	1	0.01	7	0.02	16	0.04	6	0.04	21	0.24	51	0.05
Stroke	< 1 y	7	0.22	50	0.6	84	0.81	23	0.64	23	1.06	187	0.68
	1-4 y	6	0.05	43	0.12	73	0.17	29	0.2	8	0.09	159	0.14
Pneumonia	< 1 y	13309	426.59	23606	283.6	38454	368.94	17034	474.6	8305	383.23	100708	364.58
	1-4 y	20615	159.69	42601	122.87	46186	109.4	20848	145.99	11927	136.37	142177	126.02
PCSC	< 1 y	20515	657.56	41369	497.0	56563	542.69	22295	621.18	11763	542.79	152505	552.1
	1-4 y	42402	328.45	91865	264.96	64669	153.19	27312	191.25	19186	219.37	245434	217.54

Source: Ministry of Health/Datasus - Hospital Information System (Sistema Único de Saúde [SUS], 2014). Hospitalization Rates (HR): hospitalization number/10,000 inhabitants.

Hypertension was higher in children under one year old. The northeastern region had most cases in the two age groups. Although ischemic heart disease, cerebrovascular diseases and strokes were less significant, the most relevant occurred in the southeastern and center-western regions.

Results of data collection showed the analysis of records filed in the statistics and medical file service at the hospital under analysis on the characteristics of hospitalized children (Table 2).

Most of children's hospitalizations occurred with newborns. The period of days in which a child remained in hospital comprised one to seven days, which corresponded to the time taken for the first session of antibiotic therapy. In the case of the gender of hospitalized children, there was similarity in the data, with a slight predominance of females.

Most hospitalized children came from the urban area of the municipality. The services that referred the children to hospital were predominantly the emergency care unit and hospital care. It seems that access does not occur by PHC as the coordinating unit of the attention flux in the municipality. There are even children who were born in the institution and remained hospitalized since the hospital is a reference hospital in risk pregnancy.

With regard to the definitive diagnosis for children's hospitalization, most occurred because of endocrine, nutritional and metabolic diseases (23.63%), followed by conditions originated during the perinatal period (22.72%), respiratory diseases (22.27%) and external causes (14.09%). Most children were discharged due to clinical improvement. Moreover, more admissions occurred during the winter than in other seasons.

Table 3 shows distribution of hospitalizations for Primary Care Sensitive Conditions (PCSC) in the studied institution.

The leading causes of hospitalization were endocrine, nutritional and metabolic disorders, followed by respiratory and conditions originated during the perinatal period. As for PCSC, the number of hospitalizations amounted to 23.30% (n = 62), especially for respiratory diseases (15.03%).

With regard to PCSC by group of causes of International Classification of Diseases (ICD-10), Table 4 shows that respiratory causes are responsible for more hospitalizations, followed by infectious and parasitic diseases and genital-urinary diseases.

According to the Brazilian list referring to PCSC, there was predominantly a greater variety of respiratory diseases, namely, pneumonia by unspecified organism; acute infections of the upper airways, by multiple and unspecified microorganisms; unspecified bacterial pneumonia, bronchiolitis and acute bronchitis. Table 5 demonstrates the distribution of frequencies of the respiratory diseases.

Among the respiratory diseases, the most prevalent was unspecified bacterial pneumonia (J15.9) with 34.69%, followed by acute infections of the upper airways of multiple and unspecified sites, with 16.33%, and by other bacterial pneumonia (J15.8) and acute bronchiolitis (J21), with 12.24% each. A significant number of lower respiratory tract infections, such as pneumonia, bronchiolitis and asthma and a few acute infections of the upper airways, should be underscored.

Hospitalization rates are indicators to evaluate primary care programs. Their employment assesses to what degree programs or PHC systems achieve their goals and improve the health status of the population assisted. There is evidence that better quality primary care services are associated with lower PCSC rates (Elias & Magajewsky, 2008).

Table 2. Characteristics of children at the hospital under analysis, related to age, length of stay in the institution, gender, origin, the service that made the definitive diagnosis for hospital admissions, hospitalization outcome, and seasonality. Cascavel, Paraná State, Brazil, 2014.

Characteristic	Frequency (%)	
Age		
Newborn (less than 28 days)	104	47.27
Up to six months	23	10.45
Six months to one year	13	5.90
One to four years	45	20.45
Four to nine years	35	15.90
Duration of stay in the institution		
One to seven days	133	60.45
Eight to fourteen days	50	22.72
More than fourteen days	37	16.81
Gender of hospitalized children		
Female	111	50.45%
Male	109	49.54%
Origin of the children		
Urban area	143	65.00
Rural area	15	6.81
Other localities	62	28.18
Referenced Service		
Primary Health Care	2	0.90
Emergency	59	26.81
Other (emergency medical care service, trauma emergency care service, other institutions, other sectors from the same institution)	135	61.36
Record does not give any information	10	4.54
Definitive diagnosis for admission to hospital		
Infectious and parasitic diseases	19	8.63
Blood and blood-forming organ diseases	7	3.18
Endocrine, nutritional and metabolic diseases	52	23.63
Nervous system disorders	9	4.09
Diseases of eyes and annexes	2	0.90
Circulatory diseases	2	0.90
Respiratory diseases	49	22.27
Diseases of the digestive tract	13	5.90
Genital-urinary diseases	12	5.45
Conditions originated in the perinatal period	50	22.72
Congenital malformations, deformations and chromosomal abnormalities	9	4.09
External causes	31	14.09
Others not included above	12	5.45
Hospitalization outcomes		
Discharge after getting better	209	95.00
Death	6	2.72
Transfer to another care service	5	2.27
Seasonality at time of children 's hospitalization		
Autumn	54	24.54
Winter	61	27.72
Spring	51	23.18
Summer	54	24.54
Total	220	100.00

Source: Bank Research Data. Cascavel, Paraná State, Brazil, 2014.

Several problems exist associated to primary care low coverage with regard to children groups less than five years old, such as deficiency in home visits, lack of activities for the enrolled population, maintenance of care by spontaneous demand and other administrative or technical impairments. Eventually, these problems hinder access to family health units and make hospitals the only access for health system (Elias & Magajewsky, 2008).

Children's hospitalization is certainly a complex event and often occurs because of a fragmented and timely assistance. Comprehensive health care with multiple aspects, including the promotion and

recovery of health and disease prevention, may be proposed for child care (Caldeira, Fernandes, Fonseca, & Faria, 2011). Avoidance of unnecessary hospitalization, as in the PCSC cases, is basic.

Table 3. Distribution of hospitalizations for Primary Care Sensitive Conditions (PCSC) according to International Classification of Diseases - 10. Cascavel, Paraná State, Brazil, 2014.

Classification	PCSC		Other cause's		Total**	%
	N	%	N	%		
Infectious and parasitic diseases	8	3.0	11	4.13	19	7.14
Blood and blood-forming organ diseases	3	1.12	4	1.50	7	2.63
Endocrine, nutritional and metabolic diseases	2	0.75	50	18.79	52	19.54
Nervous system disorders	3	1.12	6	2.25	9	3.38
Diseases of eyes and annexes	--	--	2	0.75	2	0.75
Circulatory diseases	--	--	2	0.75	2	0.75
Respiratory diseases	40	15.03	9	3.38	49	18.42
Diseases of the digestive tract	--	--	13	4.88	13	4.88
Genito-urinary diseases	6	2.25	6	2.25	12	4.51
Conditions originated in the perinatal period	--	--	49	18.42	49	18.42
Congenital malformations, deformations and chromosomal abnormalities	--	--	9	3.38	9	3.38
External causes	--	--	32	12.03	32	12.03
Others not included above	--	--	11	4.13	11	4.13
Total	6223.30	204	76.69	266*	100.00	

Source: Research Database. Cascavel, Paraná State, 2014. *All other hospitalization causes not related to PCSC. **Totally different from the sample due to overlapping diagnoses.

Table 4. Distribution of PCSC according to the Brazilian List of Hospitalization for Primary Care Sensitive Conditions. Cascavel, Paraná State, Brazil, 2014.

Classification	Code
Infectious and parasitic diseases	A50, A08.4, A09
Blood and blood-forming organs diseases	D50
Endocrine, nutritional and metabolic diseases	E43
Nervous system disorders	G40
Respiratory diseases	J18, J06, J15.9, J21, J20, J45, J31
Genitourinary diseases	N11, N39

Source: Research Database. Cascavel, Paraná State, Brazil, 2014.

Table 5. Distribution of the number of children hospitalized for respiratory diseases according to definitive diagnosis. Cascavel, Paraná State, Brazil, 2014.

Definitive Diagnosis	Frequency	Percentage
Acute infections of the upper airways of multiple and unspecified sites (J06)	8	16.33
Pneumonia due to other <i>streptococci</i> (J15.4)	1	2.04
Other bacterial pneumonia (J15.8)	6	12.24
Unspecified bacterial pneumonia (J15.9).	17	34.69
Asthma (J45)	5	10.20
Acute bronchitis (J20)	1	2.04
Acute bronchiolitis (J21)	6	12.24
Others	5	10.20
Total	49	100.00

Source: Research Database. Cascavel, Paraná State, Brazil, 2014.

Similarly to the cases above, the leading cause of hospitalization in Brazil in 2012 for the age group under analysis was due to pneumonia with a hospitalization rate of 426.59 in children under one year and 159.69 in children between 1 – 4 years old. Related to PCSC, the hospitalization rate was 657.56 for children under one year old and 328.45 for 1 – 4 year-old children (Datusus, 2013). These indexes are high and may be decreased if the PHC is effective.

In their 2006 study that identify PCSC (similar to current research) in Brazil for a Brazilian list of primary care sensitive conditions, Alfradique et al. (2009) showed that PCSC was responsible for 2,794,444 of the 9,812,103 admissions by SUS, or 28.5% of all hospitalizations. Hospitalization rates for sensitive conditions were equal to 149.6 per 10,000 inhabitants. The most frequent PCSC hospitalizations comprised gastroenteritis (23.2%), heart failure (11.2%), asthma (9.7%), lower airways diseases (7.4%), bacterial pneumonia (7.4%), kidney infections and urinary tract infections (7.2%), cerebrovascular diseases (6.5%) and hypertension (5.2%). It should be underscored that gastroenteritis, heart failure and asthma accounted for 44.1% of PCSC.

Similarly, research conducted in Divinópolis (MG) in 2011 for PCSC prevalence identified 2775 admissions, with main causes comprising neoplasms (18%), cardiovascular diseases (16%), pregnancy and childbirth (15%) and external causes (12%). PCSC prevalence was 36.6%, with main diagnoses including diseases of the circulatory and respiratory systems. The factors associated with hospitalization due to PCSC comprised female gender, under 13 years old, more than 40 years old and residence in the municipality under analysis (Cardoso et al., 2013).

Similar to current study, another analysis (Moura et al., 2010) showed that the main causes for PCSC in Brazil, between 1999 and 2006, to newborns, were infectious and parasitic diseases, followed by conditions originated during the perinatal period and those related to the respiratory tract. In the case of children between 28 days and less than one year old, the main causes of admissions were infectious and parasitic diseases followed by those of the respiratory system (pneumonia and asthma), as in current study.

Reinforcing current results, a research conducted in the state of Piauí, Brazil, between 2000 and 2010, revealed that the most frequent causes of hospitalization in less than one-year-old children were respiratory diseases, followed by infectious and parasitic diseases and perinatal conditions (Barreto, Nery, & Costa, 2012).

A study undertaken in the state of Pernambuco, Brazil, between 1999 and 2009, revealed high PCSC rates caused by respiratory diseases. Among the 816,628 hospital admissions recorded in children under five years old, 44.1% ($n = 380,060$) were sensitive conditions to PHC. Asthma, bacterial pneumonia and lung diseases together accounted for 89.1% of admissions (Lima, 2012).

There are some other aspects related to this issue, such as the age of hospitalized children. Current study demonstrated that 47.27% of admissions accounted for newborns. Corroborating current results, a previous study in the same public hospital showed that children under one year old had more hospitalizations (42%) than those between 1 and 5 years old (Oliveira et al., 2012).

Following the same approach on the age of children's hospitalization, another study revealed that infants were more susceptible to diseases, corroborating results in current study. Generally, when children are sick, the fact causes great concern in their families and health professionals, who are more likely to recommend hospitalization. The PCSC for this age group may denote limited access to primary health services, as current results demonstrated. This aspect would imply worsening or complications of ordinary clinical conditions. On the other hand, the outcome may also mean difficulty in coping with clinical conditions in younger children by PHC professionals (Caldeira et al., 2011).

Regarding the amount of days that children remained hospitalized, a study reported a predominance of 1 - 7 days. According to researchers, the period is related to the use of therapeutically-assisted drugs, which usually follows the medication's dispensing cycle, especially antibiotics (Oliveira et al., 2012). Therefore, mean duration of children's hospitalization amounted to 9.5 days, similar to that in current study.

Also similar to current research, a study was conducted by Oliveira, Viera, Collet, & Lima (2010) to discover the causes of hospitalization for children under five years old for the support of nursing actions in a hospital in the state of Paraná, Brazil, and recorded the prevalence of children's hospitalizations under one year old (42%), males (49.6%) with respiratory causes (49.6%). Another study registered a predominance of male hospitalizations (59%) for children under one year old (Oliveira et al., 2012).

In a study which investigated the association between categories of preventable deaths and unavoidable ones with socio-demographic, reproductive, maternal and child birth conditions variables in Porto Alegre, Rio Grande do Sul State, Brazil, there was an increased frequency of hospitalization for male children during their first year of life (Jobim & Aerts, 2008). In Montes Claros, Minas Gerais State, Brazil, a study assessing the prevalence and factors associated with pediatric hospitalization for PCSC, related to the children's

gender, showed there was 58.1% prevalence in males' hospitalization (Caldeira et al., 2011).

Most patients in current analysis came from urban areas (65.0%). According to a study conducted in Joinville, Santa Catarina State, Brazil, to describe the epidemiological clinical profile of pediatric patients hospitalized for pneumonia, between January and December 2009, in a pediatric hospital, results on the origin of admissions were similar to current analysis (Veras et al., 2010).

About the referencing of admissions, it has been observed that children comprised more than half (61.36%) the number of hospitalizations. They were either born in the institution and for some reason required hospitalization immediately after birth, or they have been referred by the emergency services. Above data demonstrate the routine flux by the municipality's emergency department, and that primary care service is not the initial access to the health care for under one-year-old children.

Basically PHC has to provide universal and continuous access to health services effectively and with quality. It is characterized as the preferential entry to the health system, with a referred territory, for planning, decentralized programming and promotion of equity (Brasil, 2010).

In Brazil, PHC is offered by the Family Health Strategy (FHS) teams whose activities may result in better child health indicators, although the context of FHS implementation and social conditions may affect the teams' results. In theory, family health teams are able to provide a more coordinated and comprehensive care to children and their families, with reduction in PCSC percentage (Caldeira et al., 2011).

Definitive diagnoses for hospital admission comprised endocrine, nutritional and metabolic diseases (23.63%), followed by conditions originated during the perinatal period (22.72%), respiratory diseases (22.27%) and external causes (14.09%). The above causes were related to all children admitted, many of whom featured more than one diagnosis during hospitalization.

Corroborating current results, a study was conducted in 2009 to characterize the profile of hospital morbidity. According to the main diagnosis for hospitalization in children under five years old, living in municipalities of the state of Paraná, Brazil, respiratory, infectious and parasitic diseases, coupled to conditions originated during the perinatal period accounted for 81.7% of admissions. Among the diseases of the respiratory system, influenza and pneumonia, with 72.1%, may be highlighted. Among infectious and parasitic diseases, intestinal infectious diseases were the most common, with

36.4%. Conditions originated in the perinatal period ranked third (Oliveira et al., 2012).

A study to examine the evolution of hospital admissions in children under five years old was conducted in the state of Piauí, Brazil, for the 2000-2010 period. Diseases of the respiratory system were the most frequent causes of hospitalization, followed by infectious and parasitic diseases and perinatal conditions. Other causes of hospitalizations together accounted for 12% during the analyzed period (Barreto et al., 2012).

Another study conducted by Ferreira, Borges, Santos, and Forster (2014) showed that PCSC reached 13.0/1000 inhabitants year⁻¹, with higher rates in females than in males; PCSC proportion related to general hospitalization in children less than 10 years old decreased (11.6 to 9.8%); and the most frequent diagnosed diseases were infectious gastroenteritis (34.4%) and pneumonia (38.1%), corroborating current study.

In general, the conditions which are a major cause of hospitalizations in children, besides their universal character, are considered sensitive to PHC. This aspect reinforces the relevance of qualification strategies and continuous education for professionals working in these services, coupled to adequate human resources and equipments and a sustainable policy towards the prevention and promotion of children's health.

Regarding to results from hospitalization, most children (95.0%) were discharged due to their clinical improvement. Corroborating these data, a study on the outcome of hospitalization, including discharge, transfers and deaths also revealed 95% for discharge, 3.0% for transfers to other institutions and 2.0% for deaths, correlated to the cause of their hospitalization (Oliveira et al., 2012).

With regards to the season in which children were admitted to hospital, there were more admissions during the winter. A research to assess hospitalizations of 0 - 5 year-old children for respiratory infections was conducted in a large hospital in the southern region of São Paulo, São Paulo State, Brazil, and confirmed highest rates of pneumonia in winter, followed by fall and spring. Summer was the season with fewer hospitalizations (Oliveira et al., 2011).

In current study, 23.30% of hospitalizations were classified as sensitive causes of ambulatory care. The other 76.69% accounted for other hospitalization causes which could be prevented, in part or in whole, by effective health services.

Survey conducted by Alfradique et al. (2009) showed that hospitalization rates (per 10,000 inhabitants) of the Brazilian Public Health System

(SUS), the primary care sensitive conditions and others, decreased 15.8% (179 to 151/10000) from 2000 to 2006, while reductions in hospitalization for other reasons was lower still, with 0.1% (419 to 376/10000). In current study, in the case of PCSC by group of causes of ICD-10, the respiratory causes were responsible for more hospitalizations (15.03%). There was a predominance of greater variations in respiratory diseases, such as pneumonia by unspecified organism, acute infections of the upper airways of multiple and unspecified organism, unspecified bacterial pneumonia, and acute bronchiolitis and bronchitis.

Conclusion

Respiratory diseases may be underscored among the leading causes of preventable hospitalizations of children under five years old both in Brazil as a whole and in current local analysis. The increased number of PCSC implies an acknowledgement of failures in PHC and in planning activities to change conditions reality for attention to children at this care level. Consequently, primary care professionals could direct their actions to prevent children's health problems. So that hospitalizations may be reduced or avoided, modifications in primary care services and the flux of attention are required. Access must be displaced from the emergency rooms to primary care. Another measure that may also be effective is the reference system, the hospital with primary care and vice versa, putting a network of child care to function to prevent new illnesses.

Another point to be incorporated into the PHC service is adherence to its attributes: longitudinality, completeness, first contact access and coordination. If the above are followed properly, they may prevent the aggravation of diseases and hospitalization for sensitive causes.

References

- Alfradique, M. E., Bonolo, P. F., Dourado, I., Lima-Costa, M. F., Macinko, J., Mendonça, C. S., ... Turci, M. A. (2009). Internações por condições sensíveis à atenção primária: a construção da lista brasileira como ferramenta para medir o desempenho do sistema de saúde (Projeto ICSAP – Brasil). *Cadernos de Saúde Pública*, 25(6), 1337-1349.
- Barreto, J. O. M., Nery, I. S., & Costa, M. S. C. (2012). Estratégia Saúde da Família e internações hospitalares em menores de 5 anos no Piauí, Brasil. *Cadernos de Saúde Pública*, 28(3), 515-526.
- Boing, A. F., Vicenzi, R. B., Magajewski, F., Boing, A. C., Moretti-Pires, R. O., Peres, K. G., ... Peres, M. A. (2012). Redução das internações por condições sensíveis à atenção primária no Brasil entre 1998-2009. *Revista de Saúde Pública*, 46(2), 359-366.
- Brasil. (2008). *Portaria nº 221 de 17 de abril de 2008. Aprova a elaboração da versão final da lista Brasileira de Internações por Condições Sensíveis à Atenção*. Brasília, DF: DOU.
- Brasil. (2010). *Atenção primária e promoção da saúde/ Conselho Nacional de Secretários de Saúde*. Brasília, DF: Conass.
- Brasil. (2011). *Portaria nº 2.488 de 21 de outubro de 2011. Aprova a Política Nacional de Atenção Básica, estabelecendo a revisão de diretrizes e normas para a organização da Atenção Básica, para a Estratégia Saúde da Família (ESF) e o Programa de Agentes Comunitários de Saúde (PACS)*. Brasília, DF: DOU.
- Caldeira, A. P., Fernandes, V. B. L., Fonseca, W. P., & Faria, A. A. (2011). Internações pediátricas por condições sensíveis à atenção primária em Montes Claros, Minas Gerais, Brasil. *Revista Brasileira de Saúde Materno Infantil*, 11(1), 61-71.
- Cardoso, C. S., Pádua, C. M., Rodrigues-Júnior, A. A., Guimarães, D. A., Carvalho, S. F., Valentin, R. F., ... Oliveira, C. D. L. (2013). Contribuição das Internações por condições sensíveis à atenção primária no perfil das admissões pelo sistema público de saúde. *Revista Panamericana de Salud Publica*, 34(4), 227-234.
- Datasus. (2013). *Departamento de Informática do SUS*. Retrieved from <http://tabnet.datasus.gov.br> on
- Elias, E., & Magajewski, F. (2008). A Atenção Primária à Saúde no sul de Santa Catarina: uma análise das internações por condições sensíveis à atenção ambulatorial, no período de 1999 a 2004. *Revista Brasileira de Epidemiologia*, 11(4), 633-647.
- Ferreira, J. B. B., Borges, M. J. G., Santos, L. L., & Forster, A. C. (2014). Internações por condições sensíveis à atenção primária à saúde em uma região de saúde paulista, 2008 a 2010. *Epidemiologia e Serviços Saúde*, 23(1), 45-56.
- Jobim, R., & Aerts, D. (2008). Mortalidade infantil evitável e fatores associados em Porto Alegre, Rio Grande do Sul, Brasil, 2000-2003. *Cadernos de Saúde Pública*, 24(1), 179-187.
- Lima, S. C. C. A. (2012). *Internações hospitalares de crianças por condições sensíveis à atenção primária à saúde: estudo de tendência Temporal em Pernambuco*. Salvador, BA: SCCA.
- Moura, B. L. A., Cunha, R. C., Aquino, R., Medina, M. G., Mota, E. L. A., Macinko, J., & Dourado, I. (2010). Principais causas de internação por condições sensíveis à atenção primária no Brasil: uma análise por faixa etária e região. *Revista Brasileira de Saúde Materno Infantil*, 10(1), 83-91.
- Nedel, F. B., Facchini, L. A., Martín-Mateo, M., Vieira, L. A., & Thumé, E. (2008). Programa Saúde da Família e condições sensíveis à atenção primária, Bagé (RS). *Revista de Saúde Pública*, 42(6), 1041-1052.
- Oliveira, B. R. G., Viera, C. S., Collet, N., & Lima, R. A. G. (2010). Causas de hospitalização no SUS de crianças de zero a quatro anos no Brasil. *Revista Brasileira de Epidemiologia*, 13(2), 268-277.

- Oliveira, B. R. G., Viera, C. S., Furtado, M. C. C., Mello, D. F., & Lima, R. A. G. (2012). Perfil de morbidade de crianças hospitalizadas em um hospital público: implicações para a Enfermagem. *Revista Brasileira de Enfermagem*, 65(4), 586-593.
- Oliveira, T. G., Moraes, J. S. B., Moreira, F. T., Arrelaro, R. C., Ricardi, V. A., Juliano, Y., & Bertagnon, J. R. (2011). Avaliação das internações de crianças de 0 a 5 anos por infecções respiratórias em um hospital de grande porte. *Einstein*, 9(4), 1514-1517.
- Pereira, F. J. R.; Silva, C. C.; Lima Neto, E. A. (2014) Condições sensíveis à atenção primária: uma revisão descritiva dos resultados da produção acadêmica brasileira. *Saúde em Debate*, 38(n. esp.), 331-342.
- Sistema Único de Saúde [SUS]. (2014) *DATASUS. Departamento de Informática do SUS. Sistema de Informações Hospitalares. Taxa de Hospitalização*. Retrieved from <http://www2.datasus.gov.br/>.
- Starfield, B. (2002). *Atenção Primária: equilíbrio entre necessidades de saúde, serviços e tecnologia*. Brasília, DF: Ministério da Saúde.
- Veras, T. N., Sandim, G., Mundim, K., Petruskas, R., Cardoso, G., & D'Agostin, J. (2010). Perfil epidemiológico de pacientes pediátricos internados com pneumonia. *Scientia Medica*, 20(4), 277-281.

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