Artigo Original

Presence and extent of the primary health care attributes among children hospitalized for pneumonia[1]

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Objective: to analyze the presence and extent of the primary health care attributes among children hospitalized for pneumonia. Method: observational and retrospective study with hospital-based case-control design, developed in three hospitals associated to the Brazilian Unified Health System, located in a city of the State of São Paulo, Brazil. The study included 690 children under five years old, with 345 cases and 345 controls. Results: both groups scored high for access to health services. In contrast, high scores for attributes such as longitudinality and coordination of care were observed for the controls. Despite low scores, integrality and family counseling were also high for the controls. Conclusion: knowledge of the aspects involving the primary health care attributes and its provision for child care are very important because they have the potential to support professionals and managers of the Brazilian Unified Health System in the organization of health services.

Descriptors: Child; Pneumonia; Primary Health Care.

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Introduction

Pneumonia is one of the most prevalent childhood diseases and the leading cause of death in children under five years old[1]. In 2012, about 6.6 million deaths occurred among children under five years old; 15% of these losses had pneumonia as the cause[2].

In Brazil, the group of respiratory diseases is the third leading cause of death and the leading cause of hospitalization for this age group, with the predominance of pneumonia as the cause of death (65%) and of hospitalization (57%) for respiratory diseases[3].

Community-acquired pneumonia remains an important cause of morbidity and mortality, in spite of broad-spectrum antibiotics and health care advances[4]. This disease is part of a set of health problems called Primary Care Sensitive Conditions (PCSCs), for which effective Primary Health Care (PHC) can decrease the risk of complications[5]. Good-quality PHC can avoid most of the complications of pneumonia, with reduction of hospitalizations, through access to services, early identification of the disease and appropriate treatment in a timely manner. Moreover, the provision of prevention actions can contribute to reduce the incidence of disease[6].

Although the recommended actions for the prevention and control of pneumonia in PHC are recognized, there are no studies exploring the attributes or characteristics of this type of care that are essential to prevent hospitalizations for pneumonia. In this sense, the goal in this study was to analyze the presence and extent of the PHC attributes among children hospitalized for pneumonia.

Method

This study was carried out with data from the research entitled "Hierarchical approach to the identification of factors associated with hospitalization for pneumonia in children under five years old: a case-control study". This is an observational and retrospective study, with hospital-based case-control design, developed in three hospitals associated with the Brazilian Unified Health System (SUS), located in a city of the State of São Paulo, Brazil, which is a university, industrial and agribusiness centre. In 2012, the total estimated population in the city was 619,746 inhabitants, 6% belonging to the age group from 0 to 5 years[7].

Considering a statistical power of 80% and significance level α=0.05, 690 children under five years old participated in the study, with 345 cases and 345 controls. As cases were considered to be children diagnosed with community-acquired pneumonia - radiologically proven – living in one of the 26 cities belonging to the Regional Department of Health, whose headquarters are located in the city, admitted to hospital by the SUS in one of the participating hospitals, from March 2012 to August 2013. For each case, a control was selected at the same hospital, of the same sex and age group of the paired case (≥2 and ≤6 months, >6 and ≤12 months, >12 and ≤ 24 months and >24 to <60 months). Controls were selected in pediatric clinical sectors, pediatric outpatient clinic and pediatric emergency room of each hospital.

The exclusion criteria were: residence time in the city less than six months, recent history of liquid or foreign body aspiration and aged less than two months, requiring compulsory hospitalization in case of pneumonia. Among the controls, children with suspected or current diagnosis of pneumonia, with some degree of kinship with the cases or residing in the same house were excluded.

Data were collected by trained interviewers who applied the Portuguese version of the Primary Care Assessment Tool (PCATool) to the mothers of the children, which had been adapted and validated to Brazil[8]. This instrument assesses the presence and extent of four essential attributes of PHC (first contact access, longitudinality, integrality and coordination of care) and two derived attributes (family counseling and community orientation). The PCATool consists of answers on a Likert-like scale, which permits the calculation of scores for each attribute (average responses of its items) with intervals from 1 to 4. It is also possible to calculate the essential PHC score (mean values of the components of the essential attributes) and the overall score of the PHC (average values of the components of essential and derived attributes). Scores equal to 4 represent the greatest presence and extent of each attribute or set of attributes; considering scores >3 as indicative of strong presence and extent of the attribute or set of attributes evaluated[8].

For the characterization of the study population, sociodemographic information was also collected through pre-coded questionnaire developed for this research.

Data analysis was performed using descriptive and inferential statistics. Cases and controls were characterized according to their distribution in relation to sociodemographic variables, using absolute and relative

frequencies. As to the scores on the PCATool, for the variables that were not normally distributed, the Mann-Whitney test was used and, for the variable overall score of PHC (which presented normal distribution), Student's t-test was used.

The original study "Hierarchical approach to the identification of factors associated with the hospitalization for pneumonia in children under five years old: a case-control study" received approval from the Institutional Review Board and complied with the recommendations of National Health Council Resolution 196/96, in force when the project was being assessed.

Results

The sociodemographic characteristics of the study population are shown in Table 1. Gender and age group, as already stated, are matching variables of cases and controls. There is a greater proportion of controls with high family income and parental higher education.

Table 1 - Characterization of cases and controls of the study participants, according to sociodemographic variables. Ribeirão Preto, SP, Brazil, 2013

Variables	Casos		Controles	
	N	%	N	%
Gender				
Male	179	51.88	179	51.88
Female	166	48.12	166	48.12
Age group (months)				
02-05.9	77	22.32	76	22.03
06-11.9	82	23.77	85	24.64
12-23.9	98	28.41	95	27.54
24-59.9	88	25.51	89	25.80
Family income in terciles (R$)				
1º terço (≤400)	133	38.55	109	31.59
2º terço >400 e ≤700	108	31.30	111	32.17
3º terço >700	104	30.14	125	
Mother education (years)				
0-4	31	8.99	30	8.70
5-8	133	38.55	115	33.33
≥ 9	181	52.46	200	57.97
Father education (years)				
0-4	43	14.05	42	13.82
5-8	132	43.14	122	40.13
≥ 9	131	42.81	140	46.05
Marital status				
With partner	254	73.62	250	72.46
Without partner	91	26.38	95	27.54

Table 2 shows PCATool scores for cases and controls. Higher scores (higher than 3) were obtained, both for cases

and controls on the first contact access attribute - use component. Higher scores for this attribute component of first contact access indicate that, in general, all mothers interviewed tend to use the reference PHC service for routine visits and for new health problems consultations, as well as for getting referrals to specialized health services. On the other hand, scores lower than 3 were obtained for the accessibility component of the first contact access attribute, both for cases and controls. It indicates that the schedule and the care not scheduled in a reference PHC service is often difficult and the waiting time for care is generally slow, according to the general perception of the mothers interviewed.

The controls showed higher scores than cases for the attributes longitudinality (3.24 vs. 3.11, p=0.003) and coordination - information system component (3.44 vs. 3.30, p=0.006). Despite being below the cutoff point, the scores of integrality attributes - services component (2.98 vs. 2.74, p = 0.004) and family orientation (2.51 vs. 2.36, p = 0.035) were higher in controls. The same was observed for the essential (2.76 versus 2.66, p=0.005) and general scores (2.66 vs. 2.57, p=0.015) of the PHC.

Statistically significant differences between cases and controls in relation to the longitudinality attribute indicate that the mothers of the control individuals reported more often that a reference professional, who has communication skills, follows up the child throughout the time in PHC. This professional is an attentive listener and knows the medical history of the child; however, he is not limited to it, recognizing the child as a person and not as someone with a health problem. The mothers also report that they would not change to another health service, even if it were easy to achieve.

Higher scores on the coordination attribute - information systems component, suggest that the PHC teams use more documents, records or reports during the consultations of the controls, according to the perception of the mothers.

For the integrality attribute - services provided component, the mothers of the individuals in the control group more frequently reported receiving guidance on the child's health during the PHC consultations, addressing healthy eating, good hygiene, appropriate sleep, safety in the home, changes in growth and development and ways to deal with the child's behavior.

The family orientation revealed high scores for the controls, which signals greater knowledge of the PHC professionals on families of the individuals in the control group and on their problems, with greater probability to include the family into the child care.

Table 2 - Comparison of the scores on the Primary Health Care attributes between cases and controls. Ribeirão Preto, SP, Brazil, 2013

Scores	Cases	Controls	p
First contact access - use			0.469*
Average	3.395	3.436	
Median	3.670	3.670	
Standard deviation	0.664	0.625	
First contact access - accessibility			0.168*
Average	2.517	2.593	
Median	2.500	2.670	
Standard deviation	0.718	0.695	
Longitudinality			0.003*
Average	3.106	3.241	
Median	3.270	3.360	
Standard deviation	0.643	0.583	
Coordination - integration of care			0.825*
Average	2.894	3.032	
Median	3.170	3.170	
Standard deviation	0.889	0.645	
Coordination - information system			0.006*
Average	3.298	3.441	
Median	3.330	3.330	
Standard deviation	0.587	0.518	
Integrality - available services			0.232*
Average	2.851	2.911	
Median	2.890	3.000	
Standard deviation	0.596	0.624	
Integrality – services provided			0.004*
Average	2.742	2.979	
Median	2.800	3.400	
Standard deviation	1.122	1.062	
Family counseling			0.035*
Average	2.362	2.515	
Median	2.170	2.500	
Standard deviation	0.914	0.938	
Community orientation			0.398*
Average	2.614	2.675	
Median	2.750	2.750	
Standard deviation	1.092	1.117	
Essential score of PHC			0.005*
Average	2.663	2.764	
Median	2.670	2.805	
Standard deviation	0.512	0.485	
Overall score of PHC			0.015 †
Average	2.566	2.665	
Median	2.550	2.680	
Standard deviation	0.540	0.522	

*Mann-Whitney test.

†Student's t test.

Discussion

Considering the children's health in the context of primary care, it is important to analyze aspects involving actions that contribute to the children's survival and to a better access to health for children, as well as to a better quality of life. In this context, the PHC attributes find space, revealing evidence that, through its dimensions, PHC contributes to the performance of the health systems[9]. Therefore, it appears that both the existence of the attribute (presence) and the degree in which it occurs (extension) have the potential to transform child health aspects.

The first contact access received high scores on the use component in both groups. This implies recognizing that both the physician and the health services the child used are the first services visited in case of need. This is one of the assumptions of the health system network organization, which uses the PHC as the means for integration and ordering[10]. Although study participants

have shown such binding behavior to the PHC reference service, it seems that the service does not always work in order to attend the demands, because both groups had scores below the cutoff point in the accessibility component. Limitations in care for spontaneous demand and scheduling difficulty contribute for the children not to get timely care for their health needs[11].

A number of authors[12] highlight the importance of access as an integrator and mediator for extended health care to happen. One study[13] reveals that parents who have increased their primary service use decreased the demand for emergency services. It reinforces the importance of awareness among parents about this use to promote the health of their children, pointing to the importance of seeking information about the level of compliance of users with health services.

One of the main aspects of the work of the PHC professionals is health surveillance, understood as the monitoring of the health needs of the population, which should guide the work process of the multiprofessional PHC team. Importantly, the health needs of children need to be individualized and interpreted based on the peculiarities of the growth and development process, as well as on the real living conditions[14].

In this sense, an important action in children's health surveillance is to monitor their growth and development[11]. This action, when carried out over time (longitudinality), especially through the routine childcare visit, permits the early detection of common diseases in childhood. It enables their treatment in a timely manner, preventing and reducing health problems[11,15], including pneumonia as a considerable problem in this clientele. In addition, there is evidence in the literature that children with malnutrition are more susceptible to serious infections like pneumonia[16]. Thus, growth monitoring of children in PHC services permits the identification of children with growth deficits, who are at higher risk of getting pneumonia, enabling the development of disease prevention actions, such as increase of the nutritional status and management of the household environment.

The high score for the longitudinality attribute indicates that children have the same professional monitoring their health over time, which enables not only the establishment of a bond[17], but also the recognition of this child as a unique individual and the knowledge acquired by this professional about the child's health. The results show that, among the controls, such scores were higher, suggesting the importance of longitudinality of care to prevent hospitalizations in children with pneumonia.

The continuity of care, mutual trust service/user and the connection between user and health professionals configure the longitudinality. Another study[18] pointed out that, despite the PHC problems, there is longitudinality of care when the access is obtained, and the positive assessment of this attribute indicates the service loyalty. Suitable longitudinality can have a positive impact on children's health and on the service network[18-19].

The coordination of care was another attribute of PHC with the highest scores among control group participants, revealing the use of instruments - including documents, records and reports - that permit the monitoring of children's health, as well as the integration of care necessary for the dialogue among sectors and health services and ensuring that the children are attended in all their needs[11].

The extended care offer becomes feasible through the existence of a relationship among sectors and the health services to direct the care in view of the actual needs of the population, based on articulated and complementary actions[20], in which PHC plays a relevant role in adjusting the current system and in the care coordination[10]. The challenges to maintain the integration of care are mainly related to the establishment of care networks, which should optimize the access and use of other health resources, ensuring the communication mechanisms that qualify care[10,20].

The child with pneumonia goes through several points of the health care network. When signs and symptoms iniciate, the child's family seek care in the PHC facilities (primary health care and family health care units). When access to PHC is difficult or insufficient, the child is assisted at the emergency units. In severe cases or cases with potential complications, the child is referred to secondary or tertiary hospitals as needed. After hospitalization, the child is usually followed in the outpatient clinic for a certain period and, after discharge, the child is referred for follow-up in PHC. The services used include diagnostic support, such as blood tests and chest X-rays. The importance of information systems for the care coordination of children with pneumonia is emphasized, which permits both the diagnosis and early treatment and continuity of care. The health records (such as records, reports, test results, referral tools and counter-referral); whether electronic or printed, enable the professionals who assist children with pneumonia to know their history. It is possible to know the risk and protection factors they are exposed to, primary diseases that can increase the chance of complications, health

conditions, interventions and treatments carried out, avoiding approaches focused on the relief of symptoms, regardless of the child's history.

The scores of integrality attributes and family counseling were considered below the cutoff point, but high scores were obtained for the controls.

Regarding the integrality attribute, the results show differences between the two groups in relation to the services provided. As already pointed out, these differences refer to the guidance the mothers receive on the health of their children during the consultations at the reference PHC service. This finding reflects the importance of integral care to the child on every opportunity presented. The child should be the focus of attention of all professionals involved in their care, so that all contact with them is an opportunity to promote health, to prevent disease and to identify early signs and symptoms of the most prevalent diseases in childhood[11].

When dealing with the integrality attribute, it is necessary to consider it as capable of permeating the ways in which practices are organized, from the fragmentation towards the whole. Therefore, it is necessary that health services act in a way that permits extended care[12].

In this context, the extension of child care by PHC professionals can contribute to the promotion of integral children's health, reducing risk factors (such as inappropriate nutrition and poor housing conditions) and enhancing protective factors (such as breastfeeding and vaccination)[21], related to the appearance or worsening of pneumonia in children.

The family orientation in PHC is revealed in the knowledge the health professional has of issues involving the child's family, such as health, illness and work. A study[22] suggests that monitoring of the child over time, in addition to home visits, enables the approach of families, knowing and understanding the social determinants of health/disease.

Adverse socioeconomic conditions of the family, together with low parental education, increase the risk and severity of pneumonia in children[23]. The educational level of the parents is related to the understanding of childcare practices and the family's socioeconomic characteristics contribute to a number of conditions, such as household crowding and poor diet, which contribute to the emergence and worsening of pneumonia in children[24].

Considering child health care, family practices for child health promotion should be strengthened for

disease prevention and early identification of signs of severity of diseases, such as pneumonia[14].

Both the essential and general scores did not reach values that demonstrated the strong presence and extent of the PHC attribute set. However, both scores were higher in the control group. It appears that, based on these results, PHC professionals need to operate beyond the case management perspective to prevent hospitalizations due to pneumonia, because care in the context of these services should not be restricted to episodes of disease. The Brazilian Unified Health System (SUS), as a broad health concept, considers the users as integrated in their family, home and community, aiming to improve people's quality of life, through comprehensive and humanistic care[25].

Importantly, a limitation of this study is the evaluation of the PHC performed from the user's perspective. These findings need to be confirmed through the evaluation from the perspective of the professionals and managers of SUS. Another limitation of this study is the inference on the role of the PHC in hospitalizations of children with pneumonia without considering other factors involved in the phenomenon during the analysis. It was observed, for example, that the families of the cases had lower economic and education conditions than the families of controls, which could have contributed to some results of this study, as these factors are involved in the occurrence and severity of childhood pneumonia. These limitations, however, do not invalidate the findings of this research. On the contrary, they suggest the need for future studies, considering all the factors involved in the disease and appropriate methodological approaches to simultaneous study risk and protective factors.

Conclusion

This study identified strong presence and extent of child care attributes over time and the coordination of services to assist these clients. However, attributes representing the availability of services, the provision of health actions and the involvement of health professionals with the family in context of life were little recognized by the mothers of both controls and cases. Even so, these attributes were present, largely among controls, signaling important aspects of child care in PHC, focused on the prevention of hospitalizations due to pneumonia.

Since the calculation of essential and general scores are based on the average of the attributes presented here, the occurrence of low scores in some attributes

should be heeded which, in turn, led to unsatisfactory results, especially among cases.

For a deeper analysis on child care than the PCATool allows, we must also consider each particular attribute in order to value the strong aspects of the health services focused on the child and to identify the weaknesses, enabling their improvement.

The knowledge on the aspects involving the attributes of PHC and its offer for childcare are extremely important to provide information for professionals and managers of the Brazilian Unified Health System (SUS), aiming for the organization of the health services.

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