Original Article

Respiratory nursing diagnoses for children with acute respiratory infection*

Diagnósticos de enfermagem respiratórios para crianças com infecção respiratória aguda

Diagnósticos de enfermería respiratorios para niños con infección respiratoria aguda

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ABSTRACT

Objectives: To identify the prevalence of nursing diagnoses: ineffective breathing pattern (IBP) (00032), ineffective airway clearance (IAC) (00031), impaired gas exchange (IGE) (00030) and impaired spontaneous ventilation (ISP) (00033), their defining characteristics and related factors, in children with acute respiratory infection. **Methods:** A quantitative, transversal approach with 151 children. Data were collected by means of interviews and pulmonary evaluation. For data analysis, we used descriptive and inferential statistics. **Results:** The most prevalent diagnosis was IBP. Adventitious breath sounds and ineffective cough were the most prevalent defining characteristics. Adventitious breath sounds increased by 80% the chance for IAC. Among the related factors, the highlights were: secretions in the bronchi and retained secretions. Secretions in the bronchi favored in 80% the occurrence of IBP and in 60% of IAC. This verified a statistically significant association between the defining characteristics and related factors of the diagnoses studied. **Conclusion:** The four diagnoses were identified in children with acute respiratory infections, with different prevalences.
Keywords: Respiratory tract infections/diagnosis; Child; Nursing diagnosis

RESUMO

Objetivos: Identificar a prevalência dos diagnósticos de enfermagem: Padrão respiratório ineficaz (PRI), Desobstrução ineficaz de vias aéreas (DIVA), Troca de gases prejudicada (TGP) e Ventilação espontânea prejudicada (VEP) suas características definidoras e fatores relacionados, em crianças com infecção respiratória aguda. **Métodos:** Estudo de abordagem quantitativa, transversal, com 151 crianças. Os dados foram coletados por meio de entrevista e de avaliação pulmonar. Para análise dos dados, foi utilizada a estatística descritiva e inferencial. **Resultados:** O diagnóstico mais prevalente foi PRI. Ruídos adventícios respiratórios e tosse ineficaz foram às características definidoras mais prevalentes. Ruídos adventícios respiratórios aumentam em 80% a chance para DIVA. Entre os fatores relacionados, destacaram-se: secreções nos brônquios e secreções retidas. Secreções nos brônquios favorecem em 80% a ocorrência de PRI e em 60% de DIVA. Verificou-se associação estatisticamente significante entre as características e fatores relacionados com os diagnósticos estudados. **Conclusão:** Os quatro diagnósticos foram identificados em crianças com infecções respiratórias agudas, apresentando prevalências distintas.
Descritores: Infecções respiratórias/diagnóstico; Criança; Diagnóstico de enfermagem

RESUMEN

Objetivos: Identificar la prevalencia de los diagnósticos de enfermería: Patrón respiratorio ineficaz (PRI), Desobstrucción ineficaz de vías aéreas (DIVA), Intercambio de gases perjudicada (IGP) y Ventilación espontánea perjudicada (VEP) sus características definidoras y factores relacionados, en niños con infección respiratoria aguda. **Métodos:** Estudio de abordaje cuantitativo, transversal, realizado con 151 niños. Los datos fueron recolectados por medio de entrevista y de evaluación pulmonar. Para el análisis de los datos, fue utilizada la estadística descriptiva e inferencial. **Resultados:** El diagnóstico más prevalente fue el PRI. Los ruidos adventicios respiratorios y tos ineficaz fueron las características definidoras más prevalentes. Los ruidos adventicios respiratorios aumentan en 80% la oportunidad para la DIVA. Entre los factores relacionados, se destacaron: secreciones en los bronquios y secreciones retenidas. Las secreciones en los bronquios favorecen en 80% la ocurrencia del PRI y en 60% la DIVA. Se verificó la asociación estadísticamente significativa entre las características y factores relacionados con los diagnósticos estudiados. **Conclusión:** Los cuatro diagnósticos fueron identificados en niños con infecciones respiratorias agudas, presentando distintas prevalancias.
Descriptores: Infecciones del sistema respiratorio/diagnóstico; Niño; Diagnóstico de enfermería

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INTRODUTION

Acute respiratory infections are responsible for most acute illnesses in children, being important causes of morbidity and mortality worldwide, especially in developing countries [1-3]. The signs and symptoms associated with respiratory infections in children can be quite severe, impairing respiratory function and alveolar ventilation, causing hypoxemia, respiratory acidosis and respiratory failure [4]. In those clinical conditions in which there is a direct impairment of the airways, it is likely to identify nursing respiratory diagnoses [3,5].

Cross-sectional studies developed with children diagnosed with acute respiratory infections and asthma revealed high prevalence of nursing diagnoses: Ineffective Breathing Pattern (IBP) and Ineffective Airway Clearance (IAC) [5-7]. Other respiratory nursing diagnoses that could fit the clinical condition of patients with respiratory infections are: Impaired Gas Exchange (IGE) and Impaired Spontaneous Ventilation (ISV).

It is noteworthy that the respiratory diagnoses are generally priority because it directly affects tissue oxygenation, which is a vital function. So health problems that affect the processes of tissue oxygenation require intensive care through ongoing assessments and nursing rapid and resolutive interventions [2].

Thus it is very important to conduct a careful evaluation of respiratory function and good clinical judgment about the presented events. These decisions enable the development of more accurate nursing respiratory diagnoses and it also improves nursing planning. However, the nurse may have difficulty to infer the nursing respiratory diagnoses, before defining common characteristics in different diagnoses.

Given the above, this study is based on the following questions: What are the prevalence of nursing diagnoses IBP, IAC, IGE and ISV in children with acute respiratory infection? What are the defining characteristics and the related factors diagnosed more oftenly in this population? Is there an association between diagnoses, defining characteristics and related factors?

In this context, the present study aimed at identifying the prevalence of the defining characteristics and related factors of nursing respiratory diagnoses IBP, IAC, IGE and ISV in children with acute respiratory infection; to determine the prevalence of the nursing diagnoses, to assess the association between defining characteristics and related factors with the diagnosis in studies and among them.

METHODS

This is a quantitative, transversal study, conducted in an internment unit of a children's hospital in the city of Fortaleza, CE. The study subjects were children of both genders, with confirmed medical diagnosis of acute respiratory infection, aged until 5 years, admitted from January to April 2011. The exclusion criteria considered were: to have other comorbidities (cardiac, renal and neurological) and children who had significant hemodynamic instability.

The sample consisted of 151 children selected by convenience, consecutively. For data collection, we built a tool based on literature searches that included the techniques of clinical examination and pulmonary evaluation, as well as publications related to respiratory diseases and nursing diagnoses [8-13].

Therefore, this instrument was composed of three parts. The first, with personal data, sociodemographic and history of child current health problem. The second, intended to collect the respiratory symptoms (cough, phlegm, dyspnea, chest pain and headache) presented by the child; and the third part consisted of detailed pulmonary physical examination. Both the interview and physical examination included questions regarding the defining characteristics and related factors to diagnose in this study.

Data were collected during the months of January and March 2011, by two nurses and four Scholarship students from the Program Scientific Initiation, previously trained. The training lasted 8 hours, during which the two nurses revised, with the academics, the diagnostic methods used for respiratory evaluation. The instrument for data collection as well as the techniques used were thoroughly discussed at that time.

Data collection began with the confirmation of medical diagnosis through medical record analyses. Then the first and second parts of the instrument were filled based on interviews with the responsible for the child. The techniques used to perform the respiratory physical examination, third part of the instrument, follow the procedures described in the literature and included general inspection, palpation, percussion and thoracic auscultation [14].

Some defining characteristics could not be assessed due to the subjects age of the study population and also the inability to perform spirometry and gasometric tests. Thus, decreased vital capacity, prolonged expiratory phase, decreased expiratory pressure, decreased inspiratory pressure, decreased minute ventilation, decreased carbon dioxide, abnormal arterial blood gases, hypercapnia, hypoxia, abnormal arterial pH, increased PCO2, decreased PO2, increased metabolic rate and decreased tidal volume were not measured.

Some related factors were not assessed, because they did not apply to the characteristics of the study population, such as: passive smoking, smoke inhalation, smoking, neuromuscular dysfunction, chronic obstructive pulmonary disease, hyperplasia of the bronchial walls, airway obstruction, exudate alveoli, presence of artificial airway, cognitive impairment, perception disorder, musculoskeletal disorder, bone deformity, hyperventilation, neurological immaturity, spinal cord injury, hypoventilation syndrome, changes in alveolar membrane and metabolic factors.

After data collection, we adopted a protocol containing the conceptual and operational definitions of each defining characteristic and related factor of nursing diagnoses in this study. These definitions were constructed by the authors based specific literature searches, being used for the classification of the presence or absence of the defining characteristics and related factors [4,8-12,14]. For the stage of diagnostic inference, two nurses were selected, who are specialists in Public health and Intensive Care Unit, they also participate of research groups and develop studies on nursing diagnoses in child health area. They were selected by convenience, and after explanations of the goals and procedures of the study, both ensured their participation by signing a Consent Form.

Information on the presence or absence of the defining characteristics and related factors were sent electronically to diagnosticians. The nurses were then asked to infer diagnoses based on the data sent. The occurrence of diagnoses was determined by absolute agreement among nurses. In case of diagnoses disagreements, both were assembled to reach a consensus.

For the data analysis, descriptive and inferential statistics were used with the software SPSS version 19.0 for Windows. For descriptive analysis, we considered the absolute frequencies, percentages and central tendency and dispersion measures. The Kolmogorov-Smirnov test was used to check normality of numerical data. To analyze the association between categorical variables, the Chi-square test was applied. The Fisher exact test was applied when the expected frequencies of categorical variables were less than five.

The study followed the aspects contained in Resolution 196/96, it was approved by the Ethical Committee of the institution, with submission number 309/10. It was also requested the parents' consent by signing the Consent Form.

RESULTS

The mean age of the evaluated children was 19.07 months (± 14.42). Regarding gender, 50.3% of the sample were male. The most prevalent medical diagnoses were pneumonia (76.2%) and asthma (27.2%).

Table 1 – Prevalence of nursing diagnoses IAC, IBP, IGE, ISV, and their defining characteristics and related factors. Fortaleza, 2011

Nursing Diagnoses	n (%)
Ineffective breathing pattern	90 (59.6)
Ineffective airway clearance	57 (37.7)
Impaired gas exchange	41 (27.2)
Impaired spontaneous ventilation	21 (13.9)
Defining Characteristics	
Adventitious respiratory sound	117 (77.5)
Ineffective cough	106 (70.2)
Dyspnea	84 (55.6)
Tachypnea	82 (54.3)
Abnormal breathing (eg, frequency, pace, depth)	82 (54.3)
Change in respiratory rate	81 (53.6)
Use of accessory muscles for breathing	66 (43.7)
Orthopnea	49 (32.5)
Expectoration	47 (31.1)
Hypoxemia	43 (28.5)
Decreased SaO2	43 (28.5)
Reduced cooperation	41 (27.2)
Tachycardia	34 (22.5)
Agitation	21 (13.9)
Apprehension	17 (11.3)
Irritability	11 (7.3)
Drowsiness	10 (6.6)
Nasal Flaring	05 (3.3)
Cough absence	03 (2.0)
Abnormal skin color (pale, darkened)	03 (2.0)
Cyanosis	01 (0.7)
Speech difficulty	01 (0.7)
Breathing with pursed lips	01 (0.7)
Waking up Headaches	01 (0.7)
Diaphoresis	0 (0.7)
Related Factors	
Bronchial secretions	135 (89.4)
Retained secretions	105 (71.5)
Asthma	41 (27.2)
Airways Spasm	41 (27.2)
Anxiety	34 (22.5)
Pain	25 (16.6)
Excessive mucus	06 (4.0)
Deformity of the chest wall	04 (2.6)

As shown in the data in Table 1, as the most prevalent defining characteristics it was obtained: adventitious respiratory sounds (77.5%), ineffective cough (70.2%), dyspnea (55.6%), abnormal breathing (54.3 %), tachypnea (54.3%) and change in respiratory rate (53.6%). As related factors, the most prevalent were: bronchial secretions (89.4%), retained secretions (71.5%), asthma (27.2%) and spasm of the airways (27.2%).

The most prevalent Nursing diagnosis was Ineffective Breathing Patterns (IBP) (59.6%), followed by Ineffective Airway Clearance (IAC) (37.7%), Impaired Gas Exchange (IGE) (27.2%) and Impaired Spontaneous Ventilation (ISV) (13.9%). The data in Table 2 shows the distribution of the defining characteristics identified in children related to the nursing diagnoses in the study.

Table 2 – Relationship between the defining characteristics and the Nursing diagnoses. Fortaleza, 2011

Defining characteristics	IAC	IBP	IGE	ISV
Agitation	p*<0.001 PR= 4.9 CI 95%= [1.70-14.0]	p*<0.001 PR=9.6 CI 95%= [1.41-66.2]	p*=0.001 PR=1.8 CI 95%= [1.09-2.99]	p*<0.001 PR=1.9 CI 95%= [1.23-3.04]
Dyspnea	p*<0.001 PR=2.5 CI 95%= [1.91-3.39]	p*<0.001 PR=36.9 CI 95%= [9.37-145]	p*<0.001 PR=1.7 CI 95%= [1.42-2.13]	p*<0.001 PR=1.3 CI 95%= [1.17-1.50]
Respiratory rate change	p*=0.031 PR=1.3 CI 95%= [1.02-1.68]	p*=0.010 PR=1.6 CI 95%= [1.12-2.48]	p*=0.028 PR=1.2 CI 95%= [1.02-1.51]	p*=0.197 PR=1.0 CI 95%= [0.95-1.23]
Orthopnea	p*<0.001 PR=2.5 CI 95%= [1.63-3.90]	p*<0.001 PR=28.8 CI 95%= [4.11-201]	p*<0.001 PR=1.6 CI 95%= [1.22-2.17]	p*=0.036 PR=1.1 CI 95% [0.98-1.37]
Adventitious respiratory sounds	p*<0.001 PR=1.6 CI 95%= [1.31-1.98]	p*=0.090 PR=1.4 CI 95%= [0.96-2.14]	p*=0.157 PR=1.1 CI 95%= [0.96-1.42]	p**=0.785 PR=1.0 CI 95%= [0.89-1.19]
Tachypnea	p*=0.042 PR=1.2 CI 95%= [1.01-1.65]	p*=0.007 PR=1.7 CI 95%= [1.15-2.54]	p*=0.035 PR=1.2 CI 95%= [1.01-1.49]	p*=0.220 PR=1.0 CI 95%= [0.95-1.22]
Use of accessory muscles for breathing	p*<0.001 PR=2.6 CI 95%= [1.87-3.88]	p*<0.001 PR=46.5 CI 95%= [6.62-327]	p*<0.001 PR=1.7 CI 95%= [1.35-2.21]	p*<0.001 PR=1.4 CI 95%= [1.24-1.72]
Abnormal skin color	p**=0.557 PR=1.8 CI 95%= [0.37-9.38]	p**=1.000 PR=1.2 CI 95%= [0.24-6.09]	p**=0.019 PR=3.8 CI 95%= [2.95-5.12]	p**=1.000 PR=0.8 CI 95%= [0.80-0.91]
Hypoxemia	p*=0.001 PR=1.6 CI 95%= [1.15-2.44]	p*<0.001 PR=3.0 CI 95%= [1.52-6.20]	p*<0.001 PR=6.9 CI 95%= [3.28-14.5]	p*<0.001 PR=1.5 CI 95%= [1.24-2.03]
Irritability	p**=0.333 PR=1.3 CI 95%= [0.72-2.70]	p**=0.201 PR=2.3 CI 95%= [0.65-8.24]	p**=0.070 PR=1.6 CI 95%= [0.85-3.17]	p**=0.009 PR=1.6 CI 95%= [0.94-2.79]
Abnormal breathing	p*=0.042 PR=1.2 CI 95%= [1.01-1.65]	p*=0.007 PR=1.7 CI 95%= [1.15-2.54]	p*=0.035 PR=1.2 CI 95%= [1.01-1.49]	p*=0.220 PR=1.0 CI 95%= [0.95-1.22]
Drowsiness	p**=0.001 PR=6.5 CI 95%= [1.02-42.5]	p**=0.050 PR=4.2 CI 95%= [0.65-27.58]	p**<0.001 PR=3.8 CI 95%= [1.10-13.27]	p**=0.146 PR=1.2 CI 95%= [0.82-1.87]
Apprehensive	p*<0.001 PR=3.8 CI 95%= [1.36-10.8]	p*=0.011 PR=3.7 CI 95%= [1.0-13.95]	p**=0.079 PR=1.4 CI 95%= [0.90-2.25]	p**<0.001 PR=1.9 CI 95%= [1.16-3.21]
Decreased Cooperation	p*<0.001 PR=1.8 CI 95%= [1.21-2.71]	p*=0.001 PR=2.4 CI 95%= [1.28-4.73]	p*=0.238 PR=1.1 CI 95%= [0.89-1.46]	p*<0.001 PR=1.3 CI 95%= [1.09-1.68]
Decreased SaO2	p*=0.001 PR=1.6 CI 95%= [1.15-2.44]	p*<0.001 PR=3.0 CI 95%= [1.52-6.20]	p*<0.001 PR=6.9 CI 95%= [3.28-14.5]	p*<0.001 PR=1.5 CI 95%= [1.24-2.03]

IAC – Ineffective Airway Clearance; IBP – Ineffective Breathing Pattern; IGE – Impaired Gas Exchange; ISV – Impaired Spontaneous Ventilation; p*= Person Chi-Square; p**= Fisher`s exact test; PR= Prevalence ratio; CI – Confidence interval

When considering the statistical significance level ($p < 0.05$), IAC diagnosis was associated with 13 features: agitation, dyspnea, change in respiratory rate, orthopnea, adventitious respiratory sounds, tachypnea, use of accessory muscles for breathing, hypoxemia, abnormal breathing, drowsiness, apprehension, reduced cooperation and decreased SaO2.

In this direction, the chances of children with acute respiratory infection to develop nursing diagnosis IAC in the presence of these characteristics were approximately six times to drowsiness, four to agitation, three to apprehension, two to dyspnea, orthopnea and use of accessory muscles for breathing. The presence of decreased cooperation increasead by 80% the chances of IAC; adventitious respiratory sounds, decreased SaO2 and hypoxemia in 60% change in respiratory rate increased the chances by 30%, and abnormal breathing and tachypnea in 20%.

Regarding the defining characteristics, 12 showed statistical significance for the IBP diagnosis, namely agitation, dyspnea, change in respiratory rate, orthopnea, tachypnea, use of accessory muscles for breathing, hypoxemia, abnormal breathing, drowsiness, apprehension, decreased cooperation and decreased SaO2.

Thus, the probability of children to develop IBP in the presence of the defining characteristics were about 46 times to use of accessory muscles, 36 to dyspnea, 28 to orthopnea, 9 for agitation, four to drowsiness, three to hypoxia, apprehensive and decreased SaO2 and twice for decreased cooperation. The presence of the defining feature, change in respiratory rate increases the chances of IBP by 60%, while tachypnea and abnormal respiration increased by 70%.

The IGE diagnosis was correlated with 11 defining characteristics: agitation, dyspnea, change in respiratory rate, orthopnea, tachypnea, use of accessory muscles for breathing, abnormal skin color, hypoxemia, abnormal breathing, drowsiness and decreased SaO2.

It was also found that the chances of children developing IGE diagnosis in the presence of defining characteristics were approximately six times to hypoxemia and decreased SaO2, and three times to abnormal skin color. The presence of the characteristic agitation increases the chances of IGE in 80%, dyspnoea and use of accessory muscles for breathing in 70%; orthopnea in 60%; change in respiratory rate, tachypnea and abnormal breathing by 20%.

Another finding was that the ISV diagnosis showed an association with nine defining characteristics: agitation, dyspnea, orthopnea, use of accessory muscles for breathing, hypoxemia, irritability, apprehension, cooperation and decreased SaO2. Therefore, it was verified that the chances for children to develop the ISV diagnosis in the presence of these characteristics were 90% for agitation and apprehension, irritability 60%; for hypoxemia and decreased SaO2 50%; 40% use the accessory muscles for breathing; for reduced cooperation and dyspnoea 30%; and for orthopnea 10%.

In this research, it was found that six defining characteristics were associated with the four nursing diagnoses in this study: agitation, dyspnea, orthopnea, use of accessory muscles for breathing, hypoxemia and decreased SaO2.

Table 3 – Relationship between the related factors and nursing diagnoses. Fortaleza, 2011

Related factors	IAC	IBP	IGE	ISV
Asthma	p*<0.001 PR=1.8 CI95%=[1.21-2.71]	p*=0.001 PR=2.4 CI95%=[1.28-4.73]	p*=0.238 PR=1.1 CI95%=[0.87-1.46]	p*=0.224 PR=1.0 CI95%=[0.92-1.29]
Airways Spasms	p*<0.001 PR=2.5 CI95%=[1.56-4.15]	p*=0.038 PR=1.6 CI 95%=[0.98-2.92]	p*=0.442 PR=1.0 CI 95%=[0.86-1.38]	p*=0.875 PR=1.0 CI 95%=[0.87-1.17]
Excessive mucus	p**=0.002 PR=2.8 CI95%=[2.27-3.54]	p**=0.082 CI 95%=[0.50-0.66]	p**=0.345 PR=1.4 CI 95%=[0.65-3.30]	p**=0.036 PR=1.7 CI 95%=[0.78-3.90]
Bronchial Secretions	p*=0.006 PR=1.6 CI95%=[1.32-1.93]	p*=0.015 PR=1.8 CI 95%=[1.24-2.76]	p**=0.237 PR=1.2 CI 95%=[0.99-1.52]	p**=0.700 PR=1.1 CI 95%=[0.95-1.27]
Anxiety	p*=0.004 PR=1.6 CI95%=[1.09-2.52]	p*=0.002 PR=2.6 CI 95%=[1.25-5.64]	p*=0.225 PR=1.1 CI 95%=[0.88-1.52]	p**=0.001 PR=1.3 CI 95%=[1.06-1.71]
Pain	p*=0.039 PR=1.4 CI95%=[0.94-2.37]	p*<0.001 PR=5.8 CI95%=[1.50-22.4]	p*=0.038 PR=1.3 CI95%=[0.94-1.95]	p**=0.347 PR=1.0 CI95%=[0.88-1.34]

RF – Related Factors; IAC – Ineffective Airway Clearance; IBP – Ineffective Breathing Pattern; IGE – Impaired Gas Exchange; ISV – Impaired Spontaneous Ventilation; *p = chi-square test; p**= Fisher exact test; PR= Prevalence ratio; CI – Confidence interval.

It can be seen in Table 3 which the IAC diagnosis was associated with six related factors: asthma, spasm of the airways, excessive mucus, bronchial secretions, anxiety and pain. Thus, the chances of children to develop a IAC diagnosis in the presence of the nursing related factors were about twice to airway spasms and excessive mucus; 80% for asthma; 60% for bronchial secretions and anxiety; 40% for pain.

The IBP diagnosis was associated with five related factors: asthma, airway spasms, bronchial secretions, anxiety and pain. Therefore, the possibility of children to develop the IBP diagnosis in the presence of these related factors were approximately five times to pain; twice for asthma and anxiety; 60% to airway spasms, and 80% for bronchial secretions.

The IGE diagnosis revealed association only with related factor pain. In the presence of this factor, the children showed approximately 30% of chances to develop this diagnosis. The ISV diagnosis showed association with only two related factors: excessive mucus and anxiety. Excessive mucus increases by 70% the chances for the manifestation of ISVdiagnosis and anxiety in 30%. It was also observed that only two related factors were not associated with any of the diagnoses in this study: retained secretions and deformity of the chest wall.

Regarding the association between nursing diagnoses in the study, it was found that all showed a statistically significant association. Thus, the chances of a children with a diagnosis present a second respiratory nursing diagnosis, ranged from 80% in relation to IBP and ISV diagnosis; and 17 times compared to IGE and ISV. Considering this as a cross-sectional study, it was not possible to determine the direction of the diagnoses association, consequently it can not be said that the presence of IBP lead to the occurrence of IAC, or vice versa.

DISCUSSION

The findings of this study showed a higher incidence of male children (50.3%). Similar research conducted with children with acute respiratory infection identified that 55.1% of the sample were also male [7]. Similar values were also reported by other studies with asthmatic children [5,6]. The results stratified by the variable age showed similarity with studies found in the literature, in which the mean age of the children was approximately 18 months [6,7].

This study showed that the most prevalent defining characteristics were: adventitious respiratory sounds, ineffective cough, dyspnoea, abnormal breathing, tachypnea, respiratory rate change and use of accessory muscles for breathing. The high occurence of these symptoms and signs may be assigned to the characteristic clinical condition of the most prevalent respiratory diseases in this population, since these clinical findings are frequently identified in cases of pneumonia and/or asthma [4]. These findings presents correlation with similar studies in which some of these characteristics have been reported with high prevalence [5-7,15].

The high occurrence of related factors to bronchial secretions and retained secretions can be attributed to excessive secretion in respiratory infections and the inability of most children to mobilize and expel them, spontaneously, from the respiratory tract. These results present correlation with the results of other researches, in which 100% of the children had bronchial secretions and airway spasms [15] and 98.7% retained secretions [7].

The Ineffective Breathing Patterns (IBP) diagnosis was predominant in the assessed children, it may be explained by the fact that, in the presence of airway obstruction and/or deficiency in the exchange of respiratory gases and pulmonary ventilation, the ventilatory pattern is compromised. However, these results differ from those found in the literature, in which, other respiratory diagnoses had a higher prevalence than the IBP [5,7,16,17].

However, these differences can be explained by sample size variation in the researches, the age evaluated and the medical diagnosis. Another fact which confirms the disagreements presented refers to the difference in the cited studies, considering that the present study evaluated four respiratory nursing diagnoses, as well as the association of them, consequently the prevalence value of a diagnosis can influence the prevalence of the other.

According to the results, some defining characteristics and related factors increase the chances of occurrence of respiratory nursing diagnoses. Other studies have also shown statistical significance for the presence of Ineffective Airway Clearance (IAC), upon the occurrence of the defining characteristics: decreased breathing sounds, adventitious respiratory sounds, dyspnea and absent expectoration. Regarding the IBP diagnosis, some authors also found a relationship with the diagnosis of accessory muscle use, dyspnea, orthopnea, breathing with pursed lips and increased respiratory rate [5,6].

Clinical manifestations resulting from acute respiratory infections contribute to the occurrence of respiratory nursing diagnoses. Thus, the presence of obstructed airways generates pulmonary hypoventilation, excessive levels of carbon dioxide and hydrogen ions in the blood, triggering then, clinical signs such as dyspnea, increased respiratory rate and depth. The

use of the accessory muscles of respiration is related to the increased inspiratory work secondary to airway obstruction. Adventitious breath sounds like wheezes and crackles occur by the passage of air in the airways and the occluded air collision with tracheobronchial secretions [17].

The absence of appropriate and resolutive nursing interventions for a child diagnosed with IAC and/or IBP, can take it to evolve into a more severe impairment of respiratory function. The fact leads to impairment in the exchange and elimination of respiratory gases, triggering thus hypoxemia, hypercapnia, and decrease of SaO2. Changes in the levels of oxygen and carbon dioxide generate hyperventilation, ie, increased respiratory effort in order to expel excess dioxide carbon. The changes in skin color, such as cyanosis can be attributed to reduced tissue perfusion and by hypoxemia [8,17].

Results of other studies [18] confirm the findings of this study, which showed that the hypoxemia characteristics, decreased SaO2, abnormal breathing and dyspnea, presented significant association to the occurrence of IGE diagnosis.

Researches conducted with patients undergoing mechanical ventilation detected the presence of two major nursing diagnoses: IBP and Impaired Spontaneous Ventilation (ISV). For ISV diagnosis, the characteristics dyspnea, increased agitation, decreased cooperation, increased heart rate and accessory muscle use, justified the inference of diagnosis, similar to our findings [19].

With regard to the relationship of the related factors to nursing diagnoses, a study found that bronchial secretions and retained secretions influenced by approximately 11 times the occurrence of IBP, and about three times IGE [16]. Although when applied to other clinical settings, these findings show similarities with this study, and the presented disagreements are related to the magnitude of the relationship between the related factors and nursing diagnosis IAC. Given the above, the importance of making comparisons with similar populations is emphasized.

Cross-sectional study conducted with children with congenital heart disease, revealed an association between diagnoses IGE IBP, IBP and IAC; therefore, in the presence of IGE the chances to develop IBP increase in twenty times, and in the presence of IBP the chances of developing IAC increase six times [20]. Although applied in different populations, these findings corroborate the results, in which the diagnoses studied showed a statistically significant association, although it was not possible to establish the direction of this association.

As limitations of the study, we highlight the scarse literature on the ISV, IGE diagnosis and its relation to children with acute respiratory infection, complicating the discussion of results through comparisons with other studies. We also emphasize the scarcity of studies on further analysis of the defining characteristics and related factors of respiratory nursing diagnoses, as well as their associations, especially for IGE and ISV diagnostic. Therefore, studies of this nature should be encouraged.

CONCLUSION

This study identified the prevalence of the defining characteristics, related factors and nursing diagnoses of IAC, IBP, IGE and ISV, as well as its prevalence and associations in children with acute respiratory infection.

Importantly, the profile of the defining characteristics, related factors, as well as the respiratory nursing diagnoses vary significantly according to the peculiarities of each population (gender, age, patology, etc..) And, therefore, generalizations should be viewed with discretion. Similar studies need to be conducted with different patient profiles, as well as in relation to other nursing diagnoses, to obtain further information representing the reality of individuals assisted, guiding the nurse in identifying the correct diagnosis, planning and execution nursing care.

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