ENDOTRACHEAL SUCTIONING IN INTENSIVE CARE UNIT: AN INTEGRATIVE REVIEW

ABSTRACT

Objective: to identify the differences between Brazilian and foreign publications on tracheal suctioning in Intensive Therapy Unit. Method: an integrative review, conducted in the Pubmed CINAHL and LILACS, with the research question << What knowledge produced on tracheal suctioning in Intensive Therapy Unit? >> It was decided by the descriptors suction and Intensive Care Unit and the operator boolean operator and for the junction of the descriptors and mesh terms suction and Intensive Care Unit. To collect data a questionnaire was used. The sample consisted of 16 articles. Results: Brazil still contributes significantly to the scientific production in Latin America and worldwide, but epidemiological studies are weak and descriptive. The studies abound and with internal and external validity. Conclusion: Brazilian nursing should be further studies that test hypotheses, appropriating epidemiological studies to strengthen the know-how. Descriptors: Suction; Intensive Care Unit; Nursing.

RESUMO

Objetivo: identificar as diferenças entre as publicações brasileiras e as do exterior, sobre a aspiração traqueal em Unidade de Terapia Intensiva. Método: revisão integradora, realizada nas bases de dados Pubmed CINAHL e LILACS, com a questão de pesquisa << Quais os conhecimentos produzidos sobre a aspiração traqueal em unidade de Terapia intensiva? >> Optou-se pelos descritores sucção e unidade de terapia intensiva e o operador booleano and para a junção dos descritores e mesh terms suction and intensive care unit. Para a coleta de dados foi utilizado um questionário. A amostra foi composta de 16 artigos. Resultados: o Brasil permanece contribuindo significativamente para a produção científica na América Latina e mundial, porém os estudos epidemiológicos são fracos e descritivos. Já os estudos do exterior são robustos e com validade interna e externa. Conclusão: a enfermagem brasileira deve ser aprofundar em estudos que testem hipóteses, apropriando-se de estudos epidemiológicos para fortalecer o saber fazer. Descritores: Sucção; Unidade de Terapia Intensiva; Enfermagem.

METHOD:

An integrative review, conducted in the Pubmed CINAHL and LILACS, with the research question << What knowledge produced on tracheal suctioning in Intensive Therapy Unit? >> It was decided by the descriptors suction and Intensive Care Unit and the operator boolean operator and for the junction of the descriptors and mesh terms suction and Intensive Care Unit. To collect data a questionnaire was used. The sample consisted of 16 articles.

RESULTS:

Brazil still contributes significantly to the scientific production in Latin America and worldwide, but epidemiological studies are weak and descriptive. The studies abound and with internal and external validity.

CONCLUSION:

Brazilian nursing should be further studies that test hypotheses, appropriating epidemiological studies to strengthen the know-how.
INTRODUCTION

Maintaining the patency of the airway is the primary goal of nursing care to patients intubated and mechanically ventilated. The accumulation of secretions is inevitable because the endotracheal cannulation prevents the defense mechanisms of the upper airway as filtration, humidification, air heating are commonly used, as well, the cough reflex is impaired.

The lack of knowledge of nurses on pulmonary physiology and management of ventilator generates a departure from the fan itself, causing the nurse to take a performance to whom the demands on the production of care in certain complications of artificial respiration in which and quick decision making immediate decisions can be decisive in therapy. In this sense, it is important that nursing is qualified to know.¹

Aspiration is the only existing form, yet capable of effectively removing accumulated secretions from the upper and lower airways when the patient does not present physiologically able to perform it. It requires a mechanical suction to activate the airways, using a vacuum with a negative pressure and suction catheter, and its appropriate size is used when the ratio 1/3 of the tracheal tube (TT). In a hospital environment this procedure is most evident, however, lately with the expansion of critical patients in chronic installed resident, especially the elderly, it is clear that the procedure is being employed by professionals in nursing homes. This technique is performed in the same way since 1936.²

Concern about the effects of tracheal aspiration in blood gas values emerged from the publication in anesthesiology in February 1970 by Azmy R. Boutros article entitled “Arterial blood oxygenation during and after endotracheal suctioning in the apneic patient.” He held a parallel uncontrolled clinical trial with 22 patients using two interventions with follow-up of 30, 60, 120 and 180 seconds in the anesthetic room. The patients were intubated and placed on the ventilator being performed in a controlled manner with tracheal aspiration time 20 and 40 seconds with suction catheters of various sizes in relation to the tracheal tube. It was noticed that when the longer the duration of aspiration FiO2 lower, the greater the fall in PaO₂ being significant in 25% of patients (P <000.5). Other variables tested as gauge suction catheter, size Tracheal Tube (TT), and hyperinflation had no significant differences with the same p.³

The advent of Closed suction system has emerged as an alternative to the open system of aspiration, because it was believed that this device was a facilitator in the increase of ventilator-associated pneumonia (VAP).

Studies are needed to stratify from which end-expiratory pressure (PEEP) this device is indicated to maintain stable oxygen fraction and pulmonary pressures in patients who require high pressures. In addition to stating your advantage in reducing the spread of microorganisms in patients with active tuberculosis being a great ally for health worker health.

OBJECTIVE

- To identify the differences between Brazilian and foreign publications on tracheal suctioning in intensive therapy unit.

METHOD

A descriptive, integrative review in order to answer the research question << What knowledge are produced on tracheal suctioning in intensive therapy unit? >>

The review is used for evidence-based practice (EBP) can provide a deeper understanding giving support to decision-making and improve clinical practice for the synthesis of certain subject, and show knowledge gaps that need to be filled with the realization new studies. This method aims to gather and synthesize research results about a defined topic or issue, in a systematic and orderly manner, contributing to a deeper understanding of the topic being investigated.¹⁵

To collect data a questionnaire was used in order to summarize the studies to answer the research question and the inclusion criteria. Chose the time frame of 10 years (2002-2012) due to the expansion of publications related to the PBE.

For homogeneous sample of articles was used the following inclusion criteria: full papers free; Languages Portuguese, English and Spanish; Study type: systematic review, clinical trials, quasi-experimental, integrative review, observational and descriptive-exploratory; intensive care unit; Human; Over 18.

Employed the descriptors available in the virtual library of health-sucking category F01.145.916 and intensive care unit and VS3.002.001.001.005 NO2.278.388.493 categories. With respect studies to search for a characteristic must be taken into account with respect to Health Descriptors (DECS) is
that in some cases, the definition of terms is different colloquial usage or keywords which hinders the recovery of eligible articles, then there is the need to read the definition of the terms for the correct use of the descriptor. We chose the Boolean operator and, since the same functions as the word “and”, providing intercession, ie shows only articles containing all keywords typed by restricting the scope of the search. Being caught a total of 17 items, however, only one item has been selected. The portal PubMed, U.S. National Library of Medicine National Institutes of Health, was prioritized as mesh terms - suction and intensive care units. Were captured four articles full text, being selected just one article about the subject. Regarding the duplicate items from the database SciELO and LILACS with total of two articles.

Already in the survey database CINAHL was held on 1st May 2012, this was the last stage formed by as encompassed several journals in its database with specificity for nursing periods with more international productions on the subject. We used the titles suctioning and intensive care units with a total of 76 articles were only 6 items. Total items listed in the sample, eight.

We performed a content analysis giving rise to two categories: Evidence on the Characteristics of tracheal aspiration and professionals regarding the procedure

RESULTS

<table>
<thead>
<tr>
<th>Title of the article</th>
<th>Type of study</th>
<th>Journal</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>A multisite survey of suctioning techniques and airway management practices.</td>
<td>A comparative multicentric study</td>
<td>Am J Crit Care</td>
<td>2003</td>
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<tr>
<td>Assessment of practical and scientific knowledge of ICU nurses in the tracheal suctioning.</td>
<td>A descriptive study</td>
<td>Enferm Intensiva</td>
<td>2004</td>
</tr>
<tr>
<td>A Requirement for 100% oxygen before and after closed suction.</td>
<td>Non randomized controlled experimental study</td>
<td>J Adv Nurs</td>
<td>2005</td>
</tr>
<tr>
<td>Open and Closed-circuit Endotracheal Suctioning in Acute Lung Injury: Efficiency and Effects on Gas Exchange.</td>
<td>Randomized clinical trial</td>
<td>Anesthesiology</td>
<td>2006</td>
</tr>
<tr>
<td>Endotracheal suction in patients of intensive care unit of a hospital in the metropolitan region of Natal-RN.</td>
<td>Descriptive-exploratory study</td>
<td>Revista Eletrônica de Enfermagem</td>
<td>2006</td>
</tr>
<tr>
<td>Pulmonary mechanics behavior after the application of Protocol of brathing physiotherapy and tracheal aspiration in patients with invasive mechanical ventilation.</td>
<td>A prospective study was conducted and random, controlled cross-type</td>
<td>Rev. bras. ter. intensiva</td>
<td>2007</td>
</tr>
<tr>
<td>Need for tracheal secretion suction: criteria used by a nursing staff of intensive care unit.</td>
<td>Descriptive-exploratory study</td>
<td>Cienc Cuid Saude</td>
<td>2008</td>
</tr>
<tr>
<td>An observational study on the open-system endotracheal suctioning practices of critical care nurses.</td>
<td>Observational study</td>
<td>J Clin Nurs</td>
<td>2008</td>
</tr>
<tr>
<td>Pain related to tracheal suctioning in awake acutely and critically ill adults: A descriptive study.</td>
<td>Descriptive study</td>
<td>Intensive and Critical Care Nursing</td>
<td>2008</td>
</tr>
<tr>
<td>Nurse care in the health Market: A study on the cost and price of the care process.</td>
<td>Case study</td>
<td>Rev. Cuidado de enfermagem online</td>
<td>2011</td>
</tr>
<tr>
<td>Endotracheal colonization and ventilator-associated pneumonia in mechanically ventilated patients according to type of endotracheal suction system.</td>
<td>Clinical nonrandomized study</td>
<td>J Korean Acad Nurs</td>
<td>2011</td>
</tr>
<tr>
<td>An open-labelled randomized controlled trial comparing costs and clinical outcomes of open endotracheal suctioning with closed endotracheal suctioning in mechanically ventilated medical intensive care patients.</td>
<td>Randomized clinical essay</td>
<td>Journal of Critical Care</td>
<td>2011</td>
</tr>
<tr>
<td>Increasing pressure support does not enhance secretion clearance if applied during manual chest wall vibration in intubated patients: a randomised trial.</td>
<td>Randomized clinical essay</td>
<td>Journal of Physiotherapy</td>
<td>2011</td>
</tr>
<tr>
<td>Oxygen saturation and secretion weight after endotracheal suctioning.</td>
<td>Quasi-experimental study</td>
<td>British Journal of Nursing</td>
<td>2011</td>
</tr>
</tbody>
</table>

Figure 1. Selected studies between the years 2002 and 2012. Source: Medline, CINAHL, LILACS

Analyzing the 16 selected papers was not homogeneity in relation to local publication. Brazil was the country with the highest number of publications with 6, two in Rio de Janeiro, one in Sao Paulo, two Rio Grande do Sul and Rio Grande do Norte. Outside the
United States and Turkey have published two articles. While India, France, Netherlands, Ireland, South Korea, Spain and Greece with an article each.

![Figure 1. Number of articles published between 2002 and 2012](image)

Figure 1 illustrates the number of publications in each year worldwide regarding tracheal aspiration with increased volume more evident in the years 2008 and 2011 when the publications doubled compared to other years.

Periodicals related to public universities in Brazil in nursing were the institutions that have published articles that focused the theme and to a lesser extent the magazine of the Association of Intensive Care Medicine (AMIB) and lastly the magazine linked to Albert Einstein Hospital. Already overseas publications are related to the specialties where each one has its own magazine. Still nursing contributes strongly with most of the authors in your area.

![Figure 2. Professionals who published on tracheal suctioning](image)

Figure 2 shows the number of nurses who have published on the subject is more than double that of other professionals, with 57% of the studies. Already physiotherapists correspond to 15% of related studies followed by graduate students with 14%, 12% physicians and psychologists with 2%. Brazil Out of all studies on the subject were conducted by nurses doctors. In Brazil there are heterogeneous with publication of doctors, teachers, graduate and undergraduate students.

Regarding the kinds of studies, the prevalence in Brazil by descriptive studies, exploratory, followed by observational. Already there is a predominance abroad by epidemiological studies with emphasis on clinical and they kind of randomized clinical trials and not well delineated. Nursing Brazilian remains linked to studies that generate hypotheses, while abroad, replicate the worldwide trend to give greater visibility to studies testing the hypothesis as in the case of clinical trials.
Figure 3 elucidates a worldwide trend to give greater visibility to studies testing the hypothesis as in the case of clinical trials with 48%. Followed by 21% exploratory descriptive studies, observational and Other 11% with 5% each.

The evidence-based practice discusses the relevance criteria of the studies. Evidence higher are the meta-analysis, however, to build it takes several randomized clinical trials, which are the second level, this requires that nursing appropriates these studies to prioritize the best evidence for each type of situation to provide a service with higher quality and uniform with the international consensus.

In relation to the titration of professionals showed that the number of nurses who have published on the subject is more than double that of other professionals, with 57% of the studies. Already physiotherapists correspond to 15% of related studies followed by graduate students with 14%, 12% physicians and psychologists with 2%. However it is clear that professionals take ownership of physiotherapy on the subject seeking answer on the multiple adversities on aspiration in order to standardize the knowledge while nursing cling to observe and describe the step-by-step technique. Demonstrates that professionals are more related to published academic career with doctors contributing with 50%, followed by 24% masters, experts and Graduates with 12% and 2% students.

DISCUSSION

- The evidences on tracheal suctioning.

Brazilian studies focusing on the subject have little internal and external validity, are generalists with mixed populations, surgical and clinics. Brazilian studies do not calculate the samples, preferring the convenience that deplete the studies and short follow-up time. Studies foreign are more robust with significant samples, and more time tracking.

The indication of the fraction of 100% O2 is routinely indicated for all patients regardless of the statistical data is not confirmed indication. The saline infusion has its restricted indication for patients who have tracheal secretions parched and this practice is not totally abolished. The Closed suction system is advantageous for patients who require End Expiratory Pressure (PEEP) and high pressures and volumes. There is no significant difference in the rate of infection associated with mechanical ventilation comparing the open and closed.

- Characteristics of professionals in relation to the procedure

In the study in Rio Grande do Norte showed that the practice of tracheal aspiration remains performed by professional level. In two studies evidenced that professionals do not perform the procedure properly relegating the washing of hands, informing a patient about the procedure, longer than 15 seconds suction. Moreover, the professionals did not record the procedure effectively, still nursing in relation to other professionals, had the most complete records. In Brazil we have a preoccupation with technique rather than with the quality of care, point out errors, but do not give solutions.

Outside Brazil, professionals also sin in the correct performance of tracheal aspiration and what more evidence is prolonged aspiration and practice reflexive. It is noteworthy that a study has shown that the length of experience was not a factor that
contributes to improved quality of care. The nurses did not know what steps the procedure of tracheal aspiration. Nurses are responsible for tracheal suctioning in the ICU and on a smaller scale physical therapists, not mentioning intermediate levels of educational aspiration episodes in patients with care of high complexity. They are concerned primarily with the quality of nursing care and the lack of uniformity of procedure.

**CONCLUSION**

The international articles are prepared by highly qualified and are generally possess doctoral university faculties. Delimit well their research studies focusing on experimental Type clinical trial to test hypotheses. Their concerns are related to the ability of the care and the impact of this assistance on patients. In their conclusions call for further studies, viable alternatives to improve the quality of care and avoid iatrogenic. Demonstrate interest in the production of knowledge and chart new paths with the best scientific evidence to date.

In Brazil it was shown that nursing studies the issue essentially assistance in academic masters. It is not clear follow-up studies, it was not viewed any Brazilian article in which the first author is a doctor. Methodology studies are weak and difficult to replicate.

In the end, the Brazilian nursing should be further studies that test hypotheses, appropriating epidemiological studies to strengthen and reflect our know-how. Redeem and exalt our practice consolidating them through scientific evidence.

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