ABSTRACT

**Objective:** to identify the knowledge of health professionals on the implementation of the tracheobronchial aspiration technique. **Method:** quantitative study with cross-sectional, with 11 nursing technicians, four nurses and two physiotherapists held in an intensive care unit of the city of Uberlândia-MG. An instrument with open and closed questions focusing on the completion of the procedure in question was applied. The data was statistically analyzed by means of the Epi-Info software version 3.5 and organized in tables. It was approved by Ethics Committee of CEPFASC-SP with the Protocol 46/2010. **Results:** in the presence of thick secretions, 12 (70.5%) subjects reported using the technique of washed with saline solution (SF) 0.9% with use of the resuscitation Kit, three (17.7%) just the SF 0.9, one (5.9%) distilled water, and one (5.9%) communicates to the nurse or the doctor the fact occurred. **Conclusion:** although most professionals have the understanding of correct forms, many did not apply them, giving need for ongoing education. **Descriptors:** Nursing; Suction; Intensive Care Units; Workers.

RESUMO

**Objetivo:** identificar o conhecimento dos profissionais da saúde sobre a realização da técnica de aspiração traqueobrônquica. **Método:** estudo quantitativo, de coorte transversal, com 11 técnicos de enfermagem, quatro enfermeiros e dois fisioterapeutas, realizado em uma Unidade de Terapia Intensiva da cidade de Uberlândia-MG. Foi aplicado instrumento com questões abertas e fechadas. Os dados foram analisados por meio do software Epi-Info versão 3.5 e organizados em tabelas. O projeto de pesquisa foi aprovado pelo Comitê de Ética da Universidade São Camilo, protocolo 46/2010. **Resultados:** na presença de secreções espessas, 12 profissionais (70,5%) informaram utilizar a técnica de lavagem com solução fisiológica (SF) a 0,9% acrescida da utilização de ambú, 03 (17,7%) utilizam apenas o SF a 0,9%, 01 (5,9%) utiliza água destilada e 01 (5,9%) comunica ao enfermeiro ou ao médico o fato ocorrido. **Conclusão:** embora a maioria dos profissionais tenha o entendimento das formas corretas, muitos não o fazem. **Descritores:** Enfermagem; Succión; Unidades de Terapia Intensiva; Trabalho.

RESUMEN

**Objetivo:** identificar los conocimientos de profesionales de la salud sobre la aplicación de la técnica de aspiración traeobronquica. **Método:** estudio cuantitatitivo, transversal, con 11 dos fisioterapeutas, cuatro enfermeras y técnicos de enfermería celebrado en la unidad de cuidados intensivos de la ciudad de Uberlandia-MG. Fue aplicado instrumento con preguntas abiertas y cerradas. Los datos fueron estadisticamente analizados mediante la Epi-Info software versión 3.5 y organizados en tablas. Fue presentado y aprobado al Comisión de Ética de CEPFASC-SP con el protocolo 46/10. **Resultados:** en presencia de secreciones espesas, 12 (70,5) sujetos informaron mediante la técnica de lavado con solución salina (SF) 0,9, el mayor uso de ambu reanimacion Kit, tres (17,7) sólo el SF 0,9, un agua destilada (5,9) y un (5,9) comunica a la enfermera o al médico el hecho. **Conclusion:** aunque la mayoría de los profesionales tiene la comprensión de la forma correcta. **Descritores:** Enfermería; Succión; Unidades de Terapia Intensiva; Trabajadores.
INTRODUCTION

Maintaining the patency of the upper airway requires intensive and challenging care for healthcare professionals during assistance to patient, particularly those in critical condition, who require respiratory care and are usually admitted to units where the multidisciplinary team care is constant and uninterrupted. Such sites have long been denominated Intensive Care Units (ICUs) and their physical structure and material and human resource dynamics are designed for rapid assistance with the constant presence of trained professionals.

In the Crimean War (1854-1856), Florence Nightingale classified their patients according to their degree of dependence, with the most critical being located closer to the nurses' area. This classification process later resulted in the ICUs.1

These units are places of high complexity, reserved and unique in the hospital environment which proposes to establish comprehensive monitoring and 24-hour surveillance, and are intended for the hospitalization of patients with severe hemodynamic instability, usually with respiratory and heart rate changes, requiring staff to improve cognitive and motor skills and have up-to-date knowledge.2

Professionals who work in these complex units are called intensivists. The care team is multidisciplinary and interdisciplinary, consisting of employees of different professions: nurses, doctors, physiotherapists, nutritionists, psychologists and social workers.3

Among the various complications that are treated in these units, the ones that professionals are most concerned about are those of respiratory nature, because this system is primarily responsible for the maintenance of homeostasis.4

Thus, it is worth noting that endotracheal suctioning is a necessary procedure and widely used on ICU patients in critical condition. The presence of the artificial tube prevents normal airway cleaning and therefore suction assists its patency.5

Small flaws in the course of tracheobronchial aspiration can bring harmful consequences to patients. There is a considerable incentive in the social sphere, as with a correct indication of tracheobronchial aspiration, patients are less exposed to complications from the procedure.

A sterile technique is used to perform the tracheobronchial aspiration, and the suction catheter kit and sterile saline should be opened; the patient is ventilated with the manual resuscitation bag and oxygen at 100%; sterile glove are worn; the vacuum suction probe is connected with the dominant hand. Then, the suction catheter is introduced at least until the end of the tube without applying the vacuum (only to the sufficient point to stimulate the cough reflex); the vacuum is applied while gently pulling and rotating on the catheter in a circular motion and to 360°, for no more than 10-15 seconds, since hypoxia and arrhythmias may develop. Then the reoxygenation and inflation of the patient’s lungs is performed, in order to obtain several breaths. When thick and tenacious secretions are found, 3-5mL of distilled water should be instilled into the airway, and if necessary an aspiration should be performed in the oropharyngeal cavity after finishing the tracheobronchial aspiration. At the end of the technique the oxygen flow must be set to the level that preceded the procedure, the bed is organized and finally hands are washed.6,7

Thus, this study aimed to identify the knowledge of health professionals on the implementation of the tracheobronchial aspiration technique.

METHOD

A quantitative, cross-sectional study. The theoretical basis was carried out through consulting literature in the library collection of the Federal University of Uberlândia (UFU), in books, magazines, scientific articles and websites of the Ministry of Health.

The study population was composed of health workers working in the hospital General ICU: nineteen nursing technicians, ten doctors, four nurses and four physiotherapists.

The sample consisted of seventeen professionals, as follows: four nurses, two physiotherapists and eleven nursing technicians. The other ten professionals declined to participate or did not fit the selection criteria.

Selection criteria were: being a health professional at the hospital General ICU; working for a minimum of six months in the unit; performing tracheobronchial aspiration technique to maintain airway patency while exercising their duties.

A questionnaire was used for data collection, containing closed questions related to the knowledge and actions of health professionals in tracheobronchial aspiration. The instrument was evaluated by experts who gave their consent after minor adjustments.
Data collection was performed in the workplace where staff received guidelines and completed a questionnaire. This action occurred in pairs, in a reserved room provided by the management unit where the researcher worked. Data were statistically analysed using Epi-Info version 3.5 and organized into tables. The collection was made in December 2010, after signing the consent form (ICF) in two copies: one for the researchers and the other for the participant.

The study was conducted in compliance to the principles of ethical research with human subjects recommended in Resolution no. 196, 10 October 1996, from the National Health Council. The research project was submitted to the Ethics in Research Committee of São Camilo University (CEP/FASC - SP) and approved through protocol 46/2010.

RESULTS

♦ Characterization of health professionals

Regarding gender, the subjects were distributed as described below.

![Table 1. Gender distribution of health professionals working in the ICU who perform tracheobronchial aspiration procedure. Uberlândia-MG, Brazil, 2010.](image)

With regard to age, it was found that the majority of professionals were represented by workers aged 20-29 years (47%), followed by professionals aged 30-39 (41%) and over 40 (12%).

![Table 2. Distribution of health professionals working in the ICU who perform tracheobronchial aspiration procedure, regarding time working at the ICU. Uberlândia-MG, Brazil, 2010.](image)

♦ Professional experience in the ICU

Concerning amount of time working, a number of observations are presented in Table below.

Hand-washing habits

Regarding hand-washing prior to the tracheobronchial aspiration, all (100%) reported performing this procedure.

Techniques

![Table 3. Techniques used by 17 health professionals to identify the need for tracheobronchial aspiration. Uberlândia-MG, Brazil, 2010.](image)

DISCUSSION

♦ Characterization of health professionals

The study population was mostly female, characteristic of the nursing profession, whose components are in the majority female; women had a representation of 14 (82.4%). In a study in Uberaba-MG, in two emergency units, both units showed the predominance of 54 (84.4%) women from the total of 64 participants, showing that Brazilian nursing is still being a mainly female profession, as it has been throughout its history.

In terms of age, seven (41%) subjects were aged 30 to 39 and two (12%) were over 40.
This ICU combines older workers with younger ones due to the hiring of new graduates by the institution, putting them to work with those who have more experience. Most are also in the beginning of their training, which affords broad acceptance of the changes that happen in everyday patient care.

♦ Time working in the Intensive Care Unit

ITUs are strategic sites for the treatment of patients in critical states and at risk of death. At these locations, the ability of the professional is a major prerequisite for the success of patient care free from malpractice, recklessness and negligence. With this, it is necessary that those who work there have a wide experience in care and critical care. This experience is usually built by the professional during their working life, although this study is not able to make such a relationship.

Professionals working in this ICU are mostly newcomers. Twelve (70.5%) workers have between one and five years of experience in the area, which shows that these workers, even though experienced in their formation areas, do not have the same experience in intensive care and, as they are in large numbers, will probably have few colleagues to turn to when questions arise about certain procedures, especially in relation to tracheobronchial aspiration. ICU experience is required when it comes to the care of critical patients that are in need of specialized care for 24 hours.

♦ Assessed knowledge

The habit of washing hands before performing tracheobronchial aspiration meets the recommendations of the Centre for Disease Control and Prevention (CDC) and the National Sanitary Surveillance Agency - ANVISA, since they determine that the simple hand-washing should be indicated where invasive procedures are performed, in direct contact with wounds and/or devices such as catheters or drains. Because aspiration is an invasive procedure, it is necessary to monitor asepsis accuracy to perform this procedure, especially in hand-washing, avoiding contamination, cross-infection and consequently decreasing the risk of iatrogenic complications to patients.

In a study carried out in order to observe hand-washing in the care of patients in contact isolation, 78% washed their hands and 22% did not. Of the 78% who washed their hands, only 3% did it before the care, and 70% alcohol was not used as an antiseptic in any situation, either before or after the contact, which is at odds with this study.12

When the subjects were asked how they identify the need for tracheobronchial aspiration, several diverging reports emerged.

It is known that suction is a risky invasive procedure, which exposes the internal areas to the external areas, demanding continuous training from the health professional.

Endotracheal suctioning is a routine technique in the hospital, especially in the ICU, due to the severity of patients that are there either under the use of mechanical ventilation (MV) or not, who cannot voluntarily expel tracheobronchial secretions, blood and vomit. It aims to maintain a patent airway, prevent infection, promote gas exchange and improve arterial oxygenation, thus improving pulmonary function.13

Most patients who are hospitalized in ICUs require ventilatory support, which indicates the need for aspiration. In a study aiming to assess the severity of patients admitted to an ICU in 1200 patients, 33.3% used the mechanical ventilator, a fact that can aggravate health status due to complications in aspiration and the patient’s general state.14

Aspiration should be performed when there is auscultation of adventitious lung sounds (snoring) or an increase in peak inspiratory pressure on the ventilator, or when the movement of secretions is audible during breathing. Included in the indications are the decrease in volume during pressure ventilation or the deterioration in oxygenation demonstrated by a fall in oxygen saturation.15

In this study, there were several options chosen for identifying whether or not to apply aspiration to the patient. Most nursing staff - eight (73%) - chose pulmonary auscultation. It is known that this technique is difficult to perform, and that they are not trained for this in their training courses.

As for choices, nursing technicians presented greater awareness of the need for aspiration, with an average of 3.09 options for identifying its need. The nurses had an average of 2.5 options, and physiotherapists had only one option to identify this need. From the data, it appears that though the nursing staff have less access to the theory itself, in practice they have more accurate view of the need for aspiration, probably because they do the most work and are constantly at the bedside, unlike other professionals who perform other bureaucratic functions and even treat other patients in the same unit. The technicians also report options not listed in the data collection instrument, such as sudden drop in oxygen saturation and visible presence of blockages in the tube.
It can be seen from this that there is no specific category that requires training, but in fact all professionals who need on-going improvement, since they differed from each other in certain conducts, despite having the same training and experience in ICU.

All participants reported using sterile gloves, which meets the recommendation by the CDC, showing the importance of sterile gloves in maintaining a technique free of microorganisms.10 As the bronchial tree is highly sensitive to infections, it is necessary to use all the parameters that give the technique the required antiseptic levels.

Of the 17 respondents, three (17.5%) said they never used the help of another professional, six (35%) said they usually asked for help, and eight (47%) responded that they do not always use help from others. This fact shows that the professionals still have trouble working in teams, being individualized in all procedures.

Aspiration performed with the required antiseptic demands is a difficult technique to be performed by only one professional, especially when washing the tube with saline, as the professional has to disconnect the respirator, instil the saline, ventilate, get the catheter, respire, wash the catheter, and reconnect the respirator, and during these procedures the dominant hand needs to be in a sterile glove, making it very difficult to accomplish all of this alone.

It is not recommended that the professional performs the aspiration procedure alone. There is a need for two professionals, especially during the endotracheal aspiration process, preventing contamination and helping to maintain the sterility of the aspiration catheter.16

However, there are situations, such as understaffing, that do not enable such a procedure to be performed by two people, which can cause fatigue and may result in stress for the professional. A study carried out to learn the risk factors for the health of nurses in the ICU showed that the lack of personnel is a factor that compromises care, and many procedures may not be performed due to lack of staffing resources in the workplace.17

Asked about their actions in the presence of thick secretions, most respondents - 12 (70.5%) - reported using the technique of washing with saline (SF) at 0.9% along with ventilator use, 3 (17.7%) used only the 0.9% saline solution, 1 (5.9%) used distilled water and 1 (5.9%) notified the nurse or doctor of the fact. Such a technique is accepted in the literature, but not recommended as often as with such frequency as found in this and other studies in the literature, as there is a need for very specific criteria for carrying out such a procedure, since it can bring great risks for the patient.

Routine use of SF is not recommended to not cause hypoxemia and respiratory tract infections. In order to fluidize secretions, humidification of the gases and effective hydration of the patient ensure there is no formation of secretion blockages; with this, there is need for neither humidification with 0.9% saline solution, nor the use of the ventilator to try to move the secretion, avoiding damage to the patient.

Aspiration causes irritation in the airways, causing vagal stimulation, with consequent bronchospasm. Moreover, the excessive negative pressure afforded by this technique reduces the oxygen supply to the lungs and generates microatelectasis. As a result of bronchospasm and atelectasis, the patient develops hypoxemia, which associated with vagal stimulation, triggers severe bradycardia with coronary vasocostriction, seriously compromising cardiac output and blood supply to tissues.18

The literature on aspiration of secretions also notes that the instillation of saline solution to fluidize the secretion does not show enough evidence to prove its effectiveness, and recommends that this procedure should be limited to cases of blockages and obstructions that do not reverse with only aspiration. Disadvantages of this procedure: causing the patient discomfort and increasing the risk of infection.19

A study carried out in order to understand the reality of hospital infections showed that the ICU was the location with most incidences, with a prevalence of pneumonia (29%), followed by bloodstream infection (27%), urinary tract infections (17%), central catheter (11%) and surgical site infections (9%), with pneumonia most often in patients on the use of MV.20

Therefore, it is necessary that health professionals, including nurses, review their concepts and practical approaches concerning patients with respiratory disorders and who have adequate technical abilities to perform the procedure.

One controversial factor that has generated discussions on tracheobronchial aspiration is the realization of pre-oxygenation. Studies show that there is need to provide more oxygen to the patient before and after aspiration, and during the procedure the
patient suffers a drop in oxygen saturation, especially if the aspiration time was exceeded by up to 15 seconds as determined by the CDC.6,10,21

In this study, although 11 professionals (65%) - the majority - reported using pre-oxygenation, increasing the frequency value of inspired oxygen, there was also divergence in the knowledge of 4 professionals (23.5%) who did not perform it, 1 (5.7%), which increased to 80%, and 1 (5.7%) who increased it by 20% above the previous value.

It appears that even though the majority are convinced of the need to protect the patient by raising the levels of oxygen, there is controversy in the understanding of some, and they may harm the patient because of the gaps in their knowledge.

* Training on the correct technique of tracheobronchial aspiration

There were various training places reported by health professionals: only eight (47.5%) reported having received during graduation, a fact that is concerning when regarding the training of education professionals, reflecting a fragile scenario, as all should have received training for this it at school and then improving through work and lifelong learning. Seven professionals (41%) received training on the job, and two (11.5%) with higher education neither received it at graduation nor at work, only acquiring this knowledge in specialization. This fact shows how fragile are the curricula of schools that form health professionals.

The use of PPE is a great challenge in all aspects of work, mainly in health, where many professionals underestimate the danger and expose their health at unnecessary risk.

Most study subjects - 12 (70.5%) - reported using a mask, which is an essential piece of equipment in avoiding contamination by droplets from the mouth.

Regarding the use of safety glasses, which constantly protect eyes from receiving splash droplets of blood and secretions, only nine (53%) use them all the time and two (11.5%) reported using sometimes, depending on the case.

The Ministry of Health stipulates that the PPE should be used when procedures are performed with the possibility of splashes of blood or body fluids entering the oral, ocular and nasal mucosa of the professional performing the procedure.22 Such actions lead to professionals being exposed to risks of biological accidents and diseases such as HIV, hepatitis, and others, besides exposing their vision to unexpected events.

A study undertaken with health professionals working in the ICUs, in relation to the use of PPE, showed that at the time of accidents, 40% of employees were using and 60% were not using PPE. The workers evaluated the procedure and judged the need for PPE use, not appreciating the real importance of its use in the prevention of occupational accidents.23

**CONCLUSION**

The study aimed to identify the knowledge of professionals about the technique of tracheobronchial aspiration performed in the ICU. Supporting articles for this technique have increase through publications of papers in the area of health, especially for nursing professionals.

This study showed that knowledge of health professionals is within the parameters established by the competent bodies, but there is controversy among professionals of the same and different education levels on the use of protective equipment, identification of the need to aspirate and aspiration techniques to offer oxygen, among others.

The team is well structured, but by the actions described there are needless risks of occupational accidents, with exposure to biological agents without the proper use of equipment, besides the risk of causing iatrogenic events in patients, due to negligence of some standards and pre-established rules.

This fact shows that there is need for continuing education on the subject of tracheobronchial aspiration so that professionals realize the aspiration procedure in the most homogenous way possible, and in this way excluding the risk of causing harm to the patient. Therefore, it is necessary to have teams of continuing education in the workplace to constantly guide and monitor the team.

It is suggested that further studies are conducted to increase knowledge on the aspiration technique.

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