

ORIGINAL ARTICLE

BIOSECURITY IN BEAUTY CENTERS: MATERIAL STRUCTURE AND PROCESSING BIOSSEGURANÇA EM CENTROS DE EMBELEZAMENTO: ESTRUTURA E PROCESSAMENTO DE MATERIAIS

BIOSEGURIDAD EN CENTROS DE EMBELLECIMIENTO: ESTRUCTURA Y PROCESAMIENTO DE MATERIALES

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ABSTRACT

Objective: to know the physical structure, process of sterilization and disposal of materials in beautification centers. **Method:** this is a quantitative, descriptive, survey-type study in 269 beautification centers, 257 beauty salons and 12 tattoo studios and body piercing. The physical structure, process of sterilization and disposal of materials used by manicures / pedicures and tattoo artists and piercers were observed. **Results:** it was observed that 33.7% of the services had a sink close to the place of care, it was evidenced that 34.8% and 43.3% did not have liquid soap and alcohol for hand hygiene; 80% did not have a sink location for cleaning articles; the autoclave was the least used equipment for instrument sterilization. 91.9% of the centers did not validate sterilization by using the biological indicator. It was observed that 86.3% of the services were not used, with 56.7% of them not being properly disposed of. **Conclusion:** it is noticed that there is a need for intervention regarding the physical space, with a sink area for diversified actions, sterilization processing and disposal of materials. **Descriptors:** Beauty and Aesthetics Centers; Containment of Biohazards; Disease Prevention; Universal Precaution; Nursing; Health Education.

RESUMO

Objetivo: conhecer a estrutura física, processo de esterilização e descarte de materiais em centros de embelezamento. *Método:* trata-se de um estudo quantitativo, descritivo, do tipo *survey*, em 269 centros de embelezamento, sendo 257 salões de beleza e 12 estúdios de tatuagem e colocação de *body piercing*. Observaram-se a estrutura física, processo de esterilização e descarte de materiais utilizados por manicures/pedicures e tatuadores e *piercers. Resultados:* nota-se que 33,7% dos serviços possuíam pia próxima ao local dos atendimentos, evidenciou-se que 34,8% e 43,3% não dispunham de sabão líquido e álcool para higienização das mãos; 80% não possuíam um local dotado de pia para a limpeza de artigos; a autoclave foi o equipamento menos usado na esterilização dos instrumentos. 91,9% dos centros não realizavam a validação da esterilização pelo uso do indicador biológico. Observou-se a não utilização de invólucros ou caixas sinalizados com data de esterilização e prazo de validade em 86,3% dos serviços, e, em 56,7% destes, não existe descarte adequado dos materiais. *Conclusão:* percebe-se que há necessidade de intervenção quanto ao espaço físico, com área dotada de pia para ações diversificadas, ao processamento de esterilização e descarte dos materiais. *Descritores:* Centros de Embelezamento e Estética; Contenção de Riscos Biológicos; Prevenção de Doenças; Precauções Universais; Enfermagem; Educação em Saúde.

RESUMEN

Objetivo: conocer la estructura física, el proceso de esterilización y descarte de materiales en centros de embellecimiento. *Método:* se trata de un estudio cuantitativo, descriptivo, del tipo *survey*, en 269 centros de embellecimiento, siendo 257 salones de belleza y 12 estudios de tatuaje y colocación de *body piercing*. Se observaron la estructura física, proceso de esterilización y descarte de materiales utilizados por manicuras/pedicuras y por los artistas de tatuajes y *piercers. Resultados:* se observa que el 33,7% de los servicios poseía fregadero cerca del local de las atenciones, se evidenció que el 34,8% y el 43,3% no disponían de jabón líquido y alcohol para higienización de las manos; el 80% no poseía un local dotado de fregadero para la limpieza de artículos; el autoclave fue el equipo menos utilizado en la esterilización de los instrumentos. El 91,9% de los centros no realizaban la validación de la esterilización por el uso del indicador biológico. Se observó la no utilización de envoltorios o cajas señalizadas con fecha de esterilización y plazo de validez en el 86,3% de los servicios, y en el 56,7% de éstos, no existe descarte adecuado de los materiales. *Conclusión:* se percibe que hay necesidad de intervención en cuanto al espacio físico, con área dotada de fregadero para acciones diversificadas, al procesamiento de esterilización y descarte de los materiales. *Descriptores:* Centros de Belleza y Estética; Contención de Riesgos Biológicos; Prevención de Enfermedades; Precauciones Universales; Enfermería; Educación en Salud.

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How to cite this article

Felipe IMA, Silva FMAM, Bassi D, Carvalho AC, Nunes SPH, Dias RS. Biossegurança em centros de embelezamento: estrutura e processamento de materiais. J Nurs UFPE on line. 2019;13:e239171 DOI: https://doi.org/10.5205/1981-8963.2019.239171

Biosecurity in beauty centers: material structure...

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INTRODUCTION

It is known that physical appearance today requires a tendency to follow the aesthetic standards ascribed by society.¹

It is perceived that world and national consumption in the beauty and esthetics sector is increasingly intense, by a large part of the population of various ages and social classes, where the search for corporal beauty and good appearance has been a practice widely diffused in the spaces in which the professionals of the segment of the corporal aesthetic work.²⁻³

However, these work situations represent risks to the health of workers and clients, since the direct contact with the skin increases the occupational risk of accident or incident with pathogenic microorganisms, ⁴ thus, procedures with sharps materials considered more traditional, related to the removal of cuticles with pliers, manicures and pedicures, among others with loss of tissue integrity, such as those of tattoo artists and piercers, can contribute to the transmission of hepatitis B and C, HIV/Aids, as well as fungal and bacterial dermatological lesions.⁵

Knowledge and adherence the to recommendations of biosafety beautification centers are therefore indispensable, 6 as is the verification of some items in these regarding the adequate structure, materials and instruments related to the cleaning / disinfection / sterilization and waste disposal for protection against biological agents and prevention of damage or damage to the health of the citizens involved (professionals and users).7

In Brazil, the National Agency for Health Surveillance (ANVISA) is the body that regulates the regulation of essential and mandatory health safety standards to be followed by these services characterized as "of interest to health", through Federal Law No. 12,592 / 2012, the provisions on the exercise of occupations in the area of embellishment.⁸ This law establishes obligation to apply minimum standards regarding the cleaning, disinfection and sterilization of instruments and non-disposable materials used in customer service and the quality of the physical structure of the services of this segment.9

It is revealed that actions of control and monitoring of these occupational hazards by the Sanitary Surveillance (VISA) also happen in the state and municipal scopes, where specific Laws, Ordinances, Resolutions and Sanitary Codes are established that have a broad impact in the field of local public health. ¹⁰⁻¹ It can be seen, however, that these regulations are not always properly adopted by beauty establishments. ¹²

It is demonstrated in the literature that the professional class of beauty and aesthetics has low

adherence related to biosafety measures, accompanied by a low perception of the risk of contamination in the work environment 13-4 associated with the use of empirical knowledge and acquired through errors and right answers. 11 It was evidenced, in research conducted in the Brazilian Northeast region, that tattoo studios and body piercing setters, which did not have VISA inspection, when compared to the inspected ones, showed greater deficiency in the sterilization process of the instruments. 15

It is added that, despite the relevance of the issue in question, scientific production on the evaluation of biosafety procedures directed at the physical structure of beautification centers is still scarce, as well as on the knowledge and adherence of these professionals to biosafety measures.^{7,9}

The following question is raised by this research, in view of this perspective: "How are the physical structure and the processing of the materials regarding the cleaning, disinfection and sterilization procedures and the disposal of waste materials in the embellishment centers?"

OBJECTIVE

• To know the physical structure and process of sterilization and disposal of materials in beautification establishments.

METHOD

This is a quantitative, descriptive, survey-type study conducted in the period between August 2016 and August 2017, in beautification services in São Luís, State of Maranhão, Brazil. It is reported that the exact number of professionals in the of beautification existing municipality is not known, since there are many establishments not registered in the competent bodies, although this is a mandatory requirement for the functioning of the same. Thus, the basis for the sample calculation of a relationship address of containing the name and the establishments providing these services was provided bv the Superintendence of Epidemiological and Sanitary Surveillance (SESS) of the municipality, in the year 2013. It was estimated that sample in 269 establishments, consisting of 257 beauty salons and 12 tattoo and piercing studios, calculated with a 95% confidence interval, a standard deviation of 0.5 and a type I error of 5% from a population of 824 establishments. Lotteries were drawn in a simple random fashion, using the program Excel 2007.

The municipality of São Luís is divided according to administrative and planning criteria of the Municipal Health Secretariat (Semus), in seven Districts Sanitary (DS). The establishments were therefore distributed as follows: DS Centro (39); DS Bequimão (104); DS Cohab (67); DS

Coroadinho (8); DS Tirirical (20) and Itaquibacanga (31).

The study population was composed of manicures / pedicures, tattoo artists and piercers, over 18 years of age, male or female, and only one professional was interviewed at each establishment, randomly selected from those available or indicated by administrator or owner thereof. Visits to salons and tattoo studios and body piercing were carried out by two well trained researchers.

It was noticed, at the beginning of the collections, that many establishments did not maintain their registers updated: some had changed of address, of commercial name and of owner. It was therefore necessary to standardize an alternative plan so that sampling was not compromised. It was stipulated that, once the establishment was not found, data collection would be performed at the next establishment located on the same street, provided that it was not part of the initial sampling. It is noticed that, nevertheless, there were losses, because, in some cases, there were no establishments that could replace those not found in order to maintain the fidelity of the initial sampling.

During the face-to-face interviews with on-site observation, the data related to an observational roadmap containing objective questions about the characteristics of the physical structure, the mechanisms and routine cleaning / disinfection / sterilization process of instruments and materials were disposal of residues present in establishments, with validated responses with and

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without observation. The script, which had 18 items, was divided into three parts: physical structure (presence of sink, liquid soap, paper towel, alcohol, sufficient instruments and a specific area for instrument sterilization); cleaning / disinfection / sterilization (presence of equipment, instrumentation and routine cleaning / disinfection / sterilization method) and waste disposal (presence of a suitable recycle bin and container and way of disposal of infected waste).

Qualitative variables were presented by means of absolute and relative frequencies and quantitative variables by mean and standard deviation. The data were encoded using the SPSS program, version 18.0, typing them in duplicate. This study was approved, in accordance with Resolution 466/12, with the Research Ethics Committee (REC) of the Ceuma University (467,184 # 2013). The consent form was signed by all the participants, before being included in the research, the Free and Informed Consent Term (FICT).

RESULTS

The characteristics of the physical structure observed in the beautification services are shown in table 1, where it was observed that only 33.7% of the centers had a place, close to the attendants, for hand washing after the procedures and, liquid soap and alcohol for hand washing and hygiene were present in 64.8% and 56.3%, respectively, and 80% of the places visited did not have a sink area exclusively for the washing of instruments.

Table 1. Physical structure observed in the beautification services. São Luís (MA), Brazil, 2017. n=269

Items	YES n	NO %
Hand hygiene sink for professionals near the customer service area	91 (33.7)	178 (66.3)
Liquid soap for hygiene of the professionals' hands	175 (64.8)	94 (35.2)
Paper towel for professional hand drying after washing	92 (34.1)	177 (65.9)
Alcohol for hygiene of professionals' hands	152 (56.3)	117 (43.7)
They have instruments (such as pliers) to guarantee sterilization at each use	208 (77.1)	61 (22.9)
Area with sink exclusively for washing instruments	53 (19.5)	216 (80.5)
Specific area for instrument sterilization	199 (73.7)	69 (26.3)

It was found that, although more than 70% had a specific area for instrument sterilization and a sufficient number of instruments, such as pliers, in order to guarantee sterilization at each use, that 12.3% and 70.6% used an autoclave and respectively, and 17.1% did not sterilize. It was on the decontamination process (cleaning / disinfection / sterilization), that 38.9% immersed the materials in solution suitable for disinfection; only 13.3% signaled the date of sterilization and shelf life; only 8.1% performed biological or chemical sterilization control; 86.3% perform preventive not autoclave maintenance; 27% greenhouse opened the

sterilizing equipment during the sterilization process and 94.8% did not have a routine description of the sterilization process (Table 2).

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Table 2. Characteristics related to the processing of materials in the services of embellishments. São Luís (MA), Brazil, 2017. (n = 269)

Items	YES	NO
	n	%
Prior disinfection of materials by immersion in a suitable solution	105 (38.9)	164 (61.1)
Instruments washed when placed in a washable plastic box marked as contaminated articles	61 (22.6)	208 (77.4)
Method used for material sterilization		
Incubator	190 (70.6)	-
Autoclave	33 (12.3)	-
Does not sterilize	46 (17.1)	-
Registration of preventive and / or corrective maintenance of the autoclave / incubator	36 (13.3)	233 (86.7)
Biological or chemical control of the sterilization process	22 (8.1)	247 (91.9)
Signed enclosures or boxes with sterilization date and expiration date	37 (13.7)	232 (86.3)
Open sterilizer equipment during sterilization	110 (40.7)	159 (59.3)
Written routine of the sterilization process	73 (27.0)	196 (73.0)

It is inferred that 56.7% of the establishments did not have a pedal bin for the disposal of gloves, cotton and other materials used in the procedures, however, all the tattoo and piercing centers

reported having a container suitable for disposing of sharps and having a special collection company for the infected waste (Table 3).

Table 3. Disposal of waste from the beautification services. São Luís (MA), Brazil, 2017 (n = 269)

14	VEC	NO
Items	YES	NO
	n	%
There is a trash can with a lid and pedal for procedure gloves, cotton disposal and etc.	116 (43.3)	153 (56.7)
There is a rigid puncture resistant container for the disposal of needles and sharp objects	12 (100)	-
Infected wastes are collected by a special collection company	12 (100)	-

DISCUSSION

It is believed that in Brazil, daily, thousands of people attend around 500 thousand beauty centers. These establishments are considered to be of public health interest if appropriate biosafety practices are not adopted¹⁶⁻⁷ in view of the fact that many diseases caused by viruses such as human papillomavirus (HPV), hepatitis B (HBV) and C (HCV) and of human immunodeficiency virus (HIV) are highly prevalent in the country, ¹⁸ and there is still the risk of infection and transmission in commercial spaces such as beauty salons and tattoo studios and body piercing.

Due to the results of this study, several sanitary inadequacies regarding aspects related to physical structure, material processing and waste disposal in beauty services are shown. Attention is drawn to the low availability of sinks for hand hygiene (HH) near the service area, as well as paper towels for hand drying after HH. Because of this fact, the unsatisfactory adhesion of handwashing19 by these professionals can be favored.

It is mentioned that the relation between asepsis of hands and the spread of diseases was established only two centuries ago, therefore,

simple hygiene of the hands with soap and water, a very important individual practice in reducing the transmission of transient colonizing microorganisms of the layer more superficial skin, ²⁰ is recognized by beautification professionals as a way to maintain self-hygiene. However, there is a very strong cultural barrier in Brazilian society, which does not associate this habit as a measure of prevention and control of infections in services. ²¹

Among other professionals in the beauty and esthetics segment, a study in a city in Ghana found that 100% of the barbers were not adhered to hand sanitizing²² and only 22.5% to 32% of barbers Pakistan²³ and Yemen²⁴ respectively. It is noteworthy, in Brazilian observational studies carried out in the Southeast and Northeast regions, that the great majority of this professional category referred to the habit of washing hands between customer service, but, nevertheless, this procedure was not observed during the researchers' permanence in the services. ^{5,9,25}

It is also exposed with respect to the use of antiseptic solutions for the hygiene of the hands, that little more than half had access to the use of 70% alcohol, that reduces the amount of

microorganisms, however, it does not remove soils.²⁶ There was also a higher percentage of establishments with dispensing of liquid soap for hand asepsis, however, it was observed that this product was not available in a single place, but in sink for different activities, that is, destined to all types of washing (fabrics, articles, handwashing).

It was also identified, in relation to the low number of exclusive washing sinks found in this study, in a similar situation in the State of Minas Gerais, in only 43% of the establishments, 7 which may compromise the biosafety care necessary to protect both the client, as well as the beauty professional.11 It is recommended, according to the laws in force by the National Agency of Sanitary Surveillance (ANVISA), that the cleaning practices with water and liquid soap or liquid detergent of the instruments (pliers, spatulas, metal sticks, nail clippers, among others), with the aid of a soft bristle brush and rubber gloves, ²⁷ precede disinfection and sterilization processes.²⁸ The previous cleaning is defined as the removal of organic residues secretions), inorganic (salts) and microbial load, besides this, it contributes directly to effectiveness of the later phases decontamination of the articles used.²⁹

In the specific area for instrument sterilization, in spite of the fact that an exclusive space was identified to house the sterilization equipment in most of the places visited, there were errors regarding the recommendation of the regulatory norms related to the existence of cabinets with doors for adequate protection of materials processed from dirt, moisture, dust, grease, food debris and other soiling. ³⁰⁻¹

Based on the question of the number of instruments (such as pliers) in order to ensure sterilization at each use, that the majority of beauty salons and tattoo studios and body piercing studios had sufficient material in relation to the quantitative of each item of the set of instruments that professionals need for customer service. It is recalled that the biosafety recommendation is that everything that is not disposable in these services should be cleaned, disinfected and/or sterilized.³² It is complemented, among the biosafety measures most recommended by MH to avoid cross infection, that each manicure / pedicure has at least six sets of nail pliers, eponychium pliers (cuticles), curettes, tweezers and spatulas of metal³¹ and each customer has their individual kit.9

It should be noted that a simple cut on the surface of the skin by nail pliers, tattoo needles, piercing inserts, razors, razors, scissors and other sharp instruments can generate traumas or microtraumas that facilitate exposure to blood and pathogens among professionals and clients, and this, associated with family sharing and among

others, at the household level or in the services of beautification, has been considered as potential risk factors for the horizontal infection of pathogenic microorganisms. 33-4

The packing of instruments used previously in the procedures with the clients in washable plastic box, signaled as container of contaminated articles, was observed, so that later the washing of the instruments was done, in a small part of this segment of services. It was also evidenced the low proportion of the previous disinfection of the materials by means of immersion in an appropriate solution, since only 38.9% of the establishments adopted this practice with sodium hypochlorite solution, but not always with the use of content between one at 15% and with an average time of 30 minutes; ³¹ and, after disinfection by immersion, the interviewers did not observe the rinsing of these instruments.

It is reported in the literature that chemical disinfection by means of liquid germicides or sanitizing products in the "Sterilizing" category, for immersion application, is a recommended method that eliminates many or all of the pathogenic microorganisms, except those with high levels of sporicidal activity.³⁵

However, alcohol is presented as a germicide of excellent efficacy at recommended concentrations and exposure times, where isopropyl alcohol is categorized as moderately more potent against vegetative bacteria (including mycobacteria) and ethyl alcohol, which is more effective against HIV viruses, HBV, HCV, among others.³⁶

The most used method for the sterilization of materials was the predominance of dry heat (greenhouses), with 70.6%. These data are converted with a research carried out in Salvador (BA), where the sterilization method most used by professionals in the salons was the dry heat in greenhouses and forninho, with a total of 70.8%, ³⁷ and in the interior of São Paulo, where 85.7% of the establishments used Forno de Pasteur. ³⁸ The small adhesion to the use of autoclaves (12.3%) can be related to the higher cost compared to the greenhouses or even the low information regarding the process of materials by the autoclave. ⁵

It should be noted that, in the sterilization carried out in a greenhouse, known as a Pasteur greenhouse, penetration and distribution of the heat occur in a non-uniform way, therefore, the process requires a longer exposure time and higher temperatures, where the temperature must be of 160 ° C, for a time of 120 minutes, and of 170 ° C, for a time of 60 minutes or, when in moist heat (autoclave), the temperature of 121 ° C, for 15 minutes, time to be counted from the reached the indicated temperature. ²⁸

It should be noted that the validity period for the instruments sterilized by the physical process is seven days, ³⁹ and the sterilization of materials

by saturated steam under pressure, the autoclave, is considered the ideal equipment by the National Agency of Sanitary Surveillance. ⁴⁰ It is also mentioned that the adoption of "stoves" for the sterilization of instruments does not have scientific proof, because they do not have thermometer or thermostat that indicates the temperature reached by the devices. ¹⁵

Another aspect is relevant: that hepatitis B virus (HBV) is highly resistant in the external environment and can survive for a week in a dry blood sample on some surface and even in containers containing cosmetic products and remain viable after several years of freezing¹², and although it should be further clarified, the literature reports that HIV can survive outside the body for days, influenced by the amount of virus and blood volume.³⁴

Similar data on the deficiencies regarding the efficacy of the sterilization process were found in studies conducted in the municipality of Jacareí, State of São Paulo¹⁵, and in the municipality of Chapecó, inland of Santa Catarina, 41 whose majority of establishments did not have the presence of the registry preventive and / or corrective maintenance of the autoclave / incubator; biological or chemical control of the sterilization process; of envelopes or boxes marked with the date of sterilization and the period of validity; of sterilized instrumentation packaged and stored in order to maintain sterilization; sterilization process and failures regarding the ideal time and temperature for sterilization with the opening of the sterilizing equipment during sterilization and also the presence of standard operating procedure (SOPs) was not observed. This negative picture is reflected in the work routine, which, in turn, shows the disorganization of services, the flaws related to the technical-scientific knowledge and the low adherence to the biosafety practices of professionals.

It is apparent from the use of a trash can with cover and pedal for the disposal of procedure gloves, cotton and others, that less than half of the on-site services had this suitable container, and only in the 12 tattoo and body-building studios visited, there was a rigid puncture resistant container for the disposal of needles and sharps and the collection of infected waste was carried out by a special collection company. In addition, none of the salons visited had a contract with a company responsible for waste management. It is reported that waste control and the final disposal of articles are the direct responsibility of beauty centers, so it is of great relevance that they promote the proper management of common and piercing waste, which constitute the main source potential of both occupational accidents (OA) and infectious-contagious diseases, 41 which can cause Biosecurity in beauty centers: material structure...

chronic diseases with a high socioeconomic impact, such as liver cirrhosis and cellular hepatocarcinoma.

In Brazil, only in 2012 were the professions related to the area of embellishment officially established by Law 12,592.8, which establishes that professionals in this branch are responsible for the proper washing, disinfection and/or sterilization of instruments used during customer service. It is inferred, however, that there is no compulsory training of these professionals in regular courses with specific training and qualification that address biosafety recommendations, because manicures/pedicures, tattoo artists and piercers are self-employed professionals with no training in health. It is suggested, therefore, the offer of training on knowledge and biosafety practices by the nurse professional, with emphasis on the elaboration of plans and programs of Health Surveillance of the Worker; research between the relation of OA and occupational diseases; training of professionals in relation to the need to use PPE at work and the implementation of health education programs aimed at improving the quality of life of this professional category. 11

t is also worth noting that VISA bodies need to be more active in order to ensure that existing health regulations are complied with, and that there is guidance, advice and supervision of specific recommendations aimed at adopting professional standards of biosafety of categories of beauty and aesthetics. It should be noted, however, that there is diversity among Brazilian states and municipalities in relation to the updating of legislation regulating the provision of services with guidelines of good practices through the preparation of handbooks and manuals; physical structure; human resources; procedures; materials and equipment, to quality assurance.^{7,9}

Some limitations are considered because it is a theme with few publications in Brazil and in the world for the specific group, and another issue is that it has not always been possible to observe all of the work process during implementation of the observational road map, such as the methods and frequency of cleaning, disinfection and sterilization of all articles used in these services. It was also noticed in some establishments that professionals were not always available to be interviewed, because it was a day of high customer service and, therefore, the interviewers had to adjust the best time for the interview. Some salons were located in areas of higher purchasing power, and the sometimes did not allow the manicures / pedicures to participate in the study.

CONCLUSION

From the findings on biosafety practices in beautification centers, it was verified from the analysis of the structure and the processing of materials that, although a high percentage of the establishments present a specific area for the sterilization of the instruments, nevertheless, a large part did not have a sink area for washing hands and instruments. It was found that the dry heat per kiln was the most used method, and only a small group adopted the practice of registration of preventive and / or corrective maintenance of control equipment, biological chemical or treatment of the sterilization process and of labeled wrappings or boxes with a sterilization date and shelf life, and less than half of the places visited had a lid and pedal for waste disposal such as procedure gloves and cotton.

In the study, it is evident that beauty services, which are not health services, but rather of public health interest, need adequate guidance on the safety of users and professionals working in these establishments on educational actions related to procedures and techniques of cleaning. disinfection and sterilization and the importance of all stages of the process, avoiding the proliferation of infectious agents and pathologies in these services.

FUNDING

Foundation for Scientific and Technological Research and Development of Maranhão - FAPEMA to the edict APP-UNIVERSAL-01026/13.

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Submission: 2018/02/13 Accepted: 2019/03/25 Publishing: 2019/05/01 Corresponding Address

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