
NURSING IN THE PROCESS OF STERILIZATION OF MATERIALS

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ABSTRACT: The study aimed to analyze the work process of the nursing professionals working in the Operating Theaters and the Sterilization and Materials Processing Center in relation to the sterilization of surgical material in a public hospital in Porto Alegre-RS. This is descriptive and exploratory research, with a qualitative approach, undertaken with 18 professionals, these being nurses, nursing technicians and auxiliary nurses. Thematic categorization was selected for analysis and interpretation of the data. The results show the description of the procedures involved in the sterilization process, the difficulties in the work process, and continuing education in health as a possible means for overcoming the difficulties. It is concluded that the workers' knowledge of the stages of the sterilization process is incipient, and that continuous education in health provides the possibility for reduction of shortcomings in the work process, as does the adoption of a reflective stance in relation to the importance of their work.

DESCRIPTORS: Nosocomial infection. Professional practice. Continuing education.

ENFERMAGEM NO PROCESSO DE ESTERILIZAÇÃO DE MATERIAIS

RESUMO: O estudo teve como objetivo analisar o processo de trabalho dos profissionais de enfermagem atuantes no Centro Cirúrgico e Centro de Material e Esterilização quanto à esterilização de material cirúrgico em um hospital público de Porto Alegre-RS. Trata-se de uma pesquisa descritiva, exploratória, com abordagem qualitativa, realizada com 18 profissionais, sendo estes enfermeiros, técnicos e auxiliares de enfermagem. Para análise e interpretação dos dados optou-se pela categorização temática. Os resultados mostram a descrição dos procedimentos envolvidos no processo de esterilização, as dificuldades no processo de trabalho e a educação permanente em saúde como meio possível de superar as dificuldades. Concluiu-se que os trabalhadores têm conhecimento incipiente das etapas do processo de esterilização, encontrando na educação permanente em saúde a possibilidade da redução de falhas no processo de trabalho, assim como da adoção de uma postura reflexiva acerca da importância de seu trabalho

DESCRIPTORIOS: Infecção hospitalar. Prática profissional. Educação continuada.

ENFERMERÍA EN EL PROCESO DE ESTERILIZACIÓN DE MATERIALES

RESUMEN: El estudio pretende analizar el trabajo de profesionales de Enfermería que actúan en la Sala de Operaciones, Centro Quirúrgico y Centro de Materiales y Esterilización en un hospital público en Porto Alegre-RS. Investigación descriptiva, exploratoria con enfoque cualitativo, realizado con 18 profesionales, enfermeras, técnicos y auxiliares de enfermería. Para el análisis e interpretación de datos optamos por categorías temáticas. Los resultados muestran la descripción de los procedimientos involucrados en el proceso de esterilización, las dificultades en el proceso de trabajo y la educación permanente en salud como medio de superar las dificultades. Se concluyó que los trabajadores son conscientes de las incipientes etapas del proceso de esterilización, de encontrar en la educación permanente en salud la posibilidad de reducción de errores de procesos de trabajo, así como la adopción de una postura reflexiva sobre la importancia de su trabajo.

DESCRIPTORIOS: Infección nosocomial. Práctica profesional. Educación continua.

INTRODUCTION

The history of Sterilization and Materials Processing Centers (SMPC) has accompanied the surgical procedures, so as to ensure better surgical conditions and invasive procedures in post-surgical care. This sector functions with a view to the prevention of infections, even if indirectly, through articulating science, safety and quality, through the nursing team.¹

The hospitalized patient is highly likely to need an invasive procedure. The majority of micro-organisms which penetrate the operative wound are transmitted in the critical sectors, such as the Operating Theaters (OT), originating from a reservoir or source present in the operative field. In this way, nearly all infections are acquired during the perioperative period when, consequently, the patient is more exposed.²

One can see the importance of the SMPC in the control of nosocomial infections, given that the infection of the surgical site is one of the principal complications caused in patients who need surgical procedures, representing a challenge for the hospitals in the control and prevention of infections. It follows that the instruments to be used with patients must be processed adequately, so that this material may not become a source of contamination by, and transmission of, micro-organisms.³

For the articles to be processed adequately – so as to ensure patient safety – it is necessary to implement Continuing Education in Health programs which reach all the professionals who work in this area, seeking changes in the work process through sensitization, engagement and the sharing and application of scientific knowledge in professional practice, as a fundamental factor for the recognition and valuing of the professionals and in the combat against infection,⁴ because health has been influenced by technological advances and indicators of the processes' quality, with the workers needing to keep up with these changes and be better trained, supported by political, cultural and ethical values.⁵

Continuing education in health is a proposal which is essential if there is to be change in the work processes and their relationships in the sector, offering improvements in the nursing care, seeking the development and improvement of the professionals. This project broadens the learning spaces for this work sector.⁶

The work of the SMPC nurse is fairly complex, as it has technical-assistential characteristics,

such as management of people and the physical area, activities specific to the sector and the handling of new technologies, as well as the ability to visualize the needs of other areas which depend on her work.⁷

Team communication and collaboration are indispensable for the carrying-out of safe working practices. In this regard, the professionals must take on complementary roles, sharing knowledge and responsibilities in resolving problems and taking decisions.

In the light of the above, the present study aimed to analyze the work process of the nursing professionals working in the OT and SMPC regarding the sterilization of surgical materials, in a public hospital in Porto Alegre.

METHODOLOGICAL ROUTE

This is a descriptive, exploratory study with a qualitative approach. "Qualitative research works with the universe of meanings, motives, aspirations, values and attitudes [...]".^{8:21-22} In addition to this, the qualitative approach allows one to understand, in the environment in which it occurs, without creating artificial situations which may mask the reality, as the data collection occurs in a natural situation. For this reason it is rich in descriptive data, having an open and sensitive plan, focussing on the reality in context.

This research was carried out in the OT and SMPC sectors of a public hospital in Porto Alegre-RS. This hospital is characterized by attending trauma, principally victims of traffic accidents, workplace accidents, violence and burns.

The research subjects were professional nurses, nursing technicians, and auxiliary nurses, working in this hospital's OT and SMPC. The following inclusion criteria were defined for the subjects: to have worked in the above-mentioned sectors for a minimum of one year, to be over 18 years of age, and to be of either sex. Those professionals who were on sick leave or maternity leave during the period of data collection were not included. The total number of participants was 18 professionals, from different shifts, 13 being from the OT and five from the SMPC.

Information was collected in a place defined by the management of the sectors involved in the study, during the months of August to October 2011, by previous arrangement. An instrument created specifically for the study was used, made up of two time periods: in the first, information

was collected on participants' socio-demographic aspects, such as age, sex, working hours, work sector, length of service and level of schooling. In the second, a semi-structured interview was held, in which the subjects were questioned on: how the surgical material is washed and prepared; what procedures are carried out in the sterilizing and storing of the surgical material; if they received some sort of training to undertake their work; and what is difficult and easy in their work routine, when they carry out the activities inherent to the sterilization process. The interviews were recorded on a digital recorder and later transcribed in full. The interviews lasted an average of 20 minutes.

Regarding analysis of the data, the following methodological path was used: arrangement, classification, and final analysis of the data.⁸ The arrangement of the data included organizing each participant's four responses. Next, after transcription, they were organized differently, by question, that is, the participants' answers to the first question were placed together, and so on in succession for all the other questions. In the following stage, the classification of the data was operationalized through thorough and repeated reading of the texts. Through this exercise, the interviewees' central ideas were learned. The final analysis showed what each participant answered individually, as well as similarities between the accounts and the subjective of the accounts, and allowed the comparison of what the literature brings, thus concluding that the same did have knowledge of the material, and the treatment of the results described in minute detail the object under study and the discussion of the findings in the light of what is in the literature.

The project was submitted for evaluation by the Ethics Committee of the hospital studied, under protocol n. 10-117. The entrance into the field only took place after the project had been approved. Ethical aspects referent to research with human beings were respected, in line with Resolution 196/96.⁹ The interviewees, on agreeing to participate in the research, signed the Terms of Free and Informed Consent. Their anonymity was assured and they are identified by numbers (1-18) and letters (N=Nurse, T=Nursing Technician, and A=Auxiliary Nurse).

RESULTS AND DISCUSSION

The interviewees' profile had the following characteristics: age range from 28 to 50 years old, average length of service of eight years, a work

day of six hours. Subjective relationships were not identified between the participants' sex and schooling. The description and documentation of the accounts brought contextual meanings of the process of sterilization of materials in the OT and SMPC, with the following categories emerging: procedures involved in the sterilization process; difficulties met in the work process; and continuing education for the health professionals as a means of overcoming the difficulties.

Procedures involved in the sterilization process

This issue covers the professionals' knowledge regarding the procedures undertaken during the process of sterilization of surgical material. Subjective relationships between the knowledge of the process and the workplace were not identified, the responses from the SMPC and OT professionals being similar. The majority of the interviewees described succinctly the stages of washing and preparation of the material, which precede the sterilization, these being in line with the literature, as made clear in the discourse below: [...] *once the excess of blood has been removed, the item is placed in a sink with running water. Next, it is placed in enzymatic detergent, later the material is washed [...] with brushes and sponges, the soap is removed in running water, and it is dried, manually or with compressed air [...]* (A 2).

The cleaning of the surgical instrument must be rigorous, this being one of the most important stages of the sterilization process. In this stage, all the dirt must be removed, as the microbial load forms barriers and protects the micro-organisms, stopping the sterilizing agents from penetrating the articles, making the subsequent stages inefficient, and compromising the sterilization.¹⁰

In line with technical policy n. 01/2009,¹¹ the OT must carry out a pre-cleaning of the material and send it to the SMPC, where it shall be immersed in lukewarm potable water with detergent, the solution being kept in contact with the instrument for a minimum of three minutes, or in line with the maker's guidance. After that, the external surface of each instrument must be rubbed with a sponge and brush until visible dirt has been eliminated. After the washing, the instrument is rinsed externally with potable water under pressure.

In spite of the literature's indicating the importance of observing the length of time the material is immersed, none of the participants

mentioned this aspect. This fact may be related to the routine of the specific use of a product, the length of time of immersion being already established in the institution and known by the workers, as shown in the following discourse: [...] *we do a pre-wash, removing the excess of blood, we place it in enzymatic detergent, and it stays there for a while. After another wash, we brush it, and then it is dried with compressed air and swabs* [...] (N 14).

The staff working in the SMPC are responsible for combatting hospital infections, as they have the purpose to reduce the activity of, or kill, the microbes in the contaminated articles.¹² Some interviewees, however, showed that they lacked adequate knowledge about the washing process, as shown below: [...] *I'm not going to talk to you about the washing process, because I'm not sure* [...] (T 11).

Continuing education in health is a strategy which has been shown to be favorable and effective in training health professionals, making it possible to transform work and its relationships in the sector. The focus on intersectorial actions, valuing of pedagogy and the involvement of different social actors make the workers more participative, broadening the learning spaces for the workplace itself. Joint work modifies, qualifies and provides professionals' personal and professional growth.⁶

The doubts about cleaning may have implications for the re-use of instruments. The authors assert that the greater the difficulty of cleaning, the sterilization will be equally more difficult; considering that cleaning is the central aspect of re-processing articles, when cleaning is not possible, an article should not be sterilized.¹³

After cleaning, the articles must be rigorously dried with clean white cloths without lint, so that possible dirt is visible. Compressed air may also be used, in tubes and the interior parts or surfaces of instruments which are difficult to access, and alcohol, ether and benzene may also be used.¹⁴ The discourse below expresses this stage succinctly: [...] *individual drying is done, organized on the tray, and wrapped* [...] (T 1).

Another important stage is the inspection of the material, as if it is not effectively clean, the washing process must be repeated. In addition to this, the articles which are not functioning, are broken or missing parts must be substituted with others and sent for maintenance. Attention is called to the fact that among the interviewees, few remembered the inspection of the material prior to packaging, as may be observed in the discourse

below: [...] *the material goes to a workbench where this material is checked and wrapped* [...] (A 6).

The correct technique for wrapping the material is very important, as it must include the organizing of the trays and the maintenance of the product, which will be handled and transported before its use. In addition to this, it must be easy to open, and provide identification in terms of the product's name, the data and who packaged it, thus allowing safe use.¹⁰ However, attention is drawn to the reports of the professionals working in the OT where they refer to the organization of the trays and wrapping. [...] *some trays arrive in a total mess, with parts missing, and you get completely lost when you're setting up [for the operation] it takes longer* [...] *they should come organized, the professionals who wrap them should be given training* [...] (T 7).

The need for change is made clear. Many factors may be coupled with the difficulties in the work process, including the lack of communication between the professionals. This situation may be fixed with the introduction of Continuing Education for Health as a teaching methodology, in which the discussion groups are the fruit of these transformations, making these spaces and the sharing of experiences possible, in which it is possible to verbalize the problems and the bottlenecks referent to the work process, and build, collectively, the paths to change.⁶

In relation to the lack of material, the hospital must seek means for supplying the needs presented, which can often lead to improvisation and creativity, so long as this does not interfere with the quality of the attendance.¹⁵ However, so as not to interfere with the quality, these improvised processes must not become 'routine', but rather must be maintained as exceptions, a fact that in the majority of contexts does not occur.

The study's subjects, when questioned on how the surgical material is sterilized and stored, were not able to describe the stages, and did not state the types of packaging and sterilization, as presented in the following accounts: [...] *it goes to the autoclave, how long for, I don't know, because I don't work in sterilization, but it's either 127°C and 164°C, if I'm not mistaken, I don't know how long it stays there for* [...] (N 8); [...] *it's in autoclaves, and with steam? I don't know* [...] (T 9); [...] *the material is closed up on the trays, and is sent for sterilization in the autoclave* [...] (T 4).

For control of the process and the validation of the sterilization, that is, verification of the

efficacy of the parameters of the equipment and sterilization, there are indicators which can be physical, chemical or biological. By means of these indicators, it is possible to perceive flaws in the equipment's electrical and hydraulic installation. Further, it is necessary to create protocols and one's own documents, so that everything may be documented.¹⁰

Only some of the participants mentioned the control of the process of sterilization, through indicators, as seen in the reports below. Some accounts are not in line with what is found in the literature, in addition to revealing insecurity in the interpretation of the results of the indicators, such as for example the checking of the color of the tape (brown, red or black). It is essential for workers to know this stage, as it is what specifies whether the material is sterile for use. [...] *it is sterile if the little tape is brown, the tape which is yellow goes brown* (T 5); [...] *I only know about the tape, after sterilization it changes, it goes red* [...] (T 11); [...] *the guarantee that the material is sterile is a tape, a tape which has the black stripe* [...] (T 10); [...] *I have difficulty with the biological and chemical agents, ...* when you use one, when the other [...] (N 8).

The storage is the final stage of the process. However, some care is necessary to avoid re-contamination. The storage area follows the following recommendations: it must not be an environment where many people circulate, the ideal temperature is between 18°C and 22° C and the distance between the shelves must be 5 cm from the walls, 25 cm from the floor and 45 cm from the ceiling.¹⁶ This reality is not consistent with the accounts below, which show weakness in this stage: [...] *in the store, tray lies upon tray, packet on top of packet. It's routine for a packet to be torn or wet and there isn't adequate space for the amount of material* [...] (T 1).

Each institution needs to develop control over the distribution and transporting of the products, so as to avoid contamination. In addition to this, in the event of suspicion regarding shortcomings in the sterilization process, it is necessary to be able to track this material and stop it being used, or further, to know where it is.¹⁰

Some of the subjects researched describe the place where the material is stored as small, disorganized and having much contact with a contaminated environment. All agree that it is necessary for a single worker to be responsible for distribution of the material to the OT, avoiding the handling of sterile material by various persons, as may be seen in the following statements: [...]

the entrance to the store-room is open for everybody to get the material. [...] the door opens onto the road, this door enters in contact with the material, just like that door the patient enters through. What would be right would be for it to have a different, closed, place. [...] even if it has all the indicators, it can run the risk of being contaminated [...] (A 2).

To ensure that the material is sterile, one must take into account this material's conditions, that is, consider the quality, the integrity of the wrapping, its sealing, the storage conditions, and the events which occur, such as: drops to the ground, handling, and the transport conditions.¹⁷ This explains the professionals' concern regarding the storage conditions of the material inside the operating theaters, as expressed in the following discourse: [...] *material remains stored inside the theater, but ends up being exposed. The doctors put things on top, sometimes this tears the wrapping, everybody touches it and handles it a lot, operations get contaminated, etc.* [...] (T 12).

The SMPC has an exclusive role in knowledge about the quantity and storage of the sterilized articles, as well as about the provision and estimation, contributing to assistance of the patient and the surgical team.¹⁸ In addition to this, it is important for this sector to be functioning adequately, carrying out all the stages with quality and safety, and having qualified workers – as their work influences the prevention and control of infections.

Difficulties met in the work process

In this matter, the interviewees identify the obstacles inherent to the sterilization process. In the accounts below, one can perceive that one of the impasses indicated is related to the shortcomings in the institution's physical area, which create problems with the flow of material. [...] *everything is too close to each other, which I think is wrong. The space is too small for the amount of material which goes there* [operating theater], after, it will be packaged up less than three meters from the other set, where blood might be dripping [...] (T 5); [...] *since I have been here, there has never been a barrier between the clean and dirty areas, but we know it should exist* [...] *washing and assembling less than one meter away, no barrier whatsoever* [...] (A 2).

The physical area of the center for sterilizing and processing materials should be one-way and continuous, with physical barriers to stop workers changing area, thus avoiding the crossing of clean

and dirty articles. It should also include an area for the workers to have breaks and eat.¹⁶

The workers in the SMPC work at a high speed, with physical and mental demands, exposed to chemical, physical and biological risks, in addition to working in a small physical space and with the heat from the autoclaves. All these factors cause strain, anxiety and fear, compromising not just their health but the quality of the service too,¹⁹ as shown in the following statement: [...] *everything is very fast, everything is for yesterday, without regard to time, the physical conditions for the people who work in the SMPC, an unsafe physical space, terrible conditions as regards the temperature [...]* (T 1).

The difficulties of the work in the SMPC are reflected directly in the quality of the indirect assistance given; these are associated with the lack of technical skill to perform the function, and professionals working when they are ill.¹² The poor prestige of carrying out this work may be linked to the fact that this sector is unknown to the units which it services.²⁰

Research undertaken with nurses in units which use the services of the SMPC shows these professionals' perception of the SMPC workers, revealing little knowledge about this sector and the lack of value given to the work performed there.²⁰ The statement below expresses this issue: [...] *the staff in the other units don't value the work of the SMPC, which sometimes influences the new workers, who don't perform the work adequately, feeling themselves put down [...]* (A 15).

The work process is characterized by the set of activities in which the professionals transform an object into a product. In the health services, however, this work object is the human being, which has as characteristics emotions, needs and desires, which it would like attended by health professionals. In the SMPC, however, the product is consumed by another person who is not the human being directly, but who is, rather, another person from the institution. In this way, the provision of the care may not be perceived by the workers.²¹ [...] *the SMPC is not valued very much, it's only when things are missing that they remember where they come from. The hospital can't function without the SMPC [...] the hospital is very old, archaic, the bosses are old, they don't accept change, a more global view of the problem. They think they're operating in the age of the dinosaurs [...]* (A 2).

It is evidenced in the discourses that the professionals feel impotent in the face of these difficulties, as they cannot change the vision of the

managers and the other workers in the units which consume the processed articles. Two interviewees, however, emphasize that previous experience of working in the OT facilitates the work, as the professionals are already familiar with the material used. [...] *I already know the material, it helps when you're putting the items on the trays. [...]* (A 17); [...] *somebody who works in the SMPC is different from somebody who has never worked there, we know how to work with the patient and also to work with the material to be sterilized [...]* (A 15).

Regarding the improvement of this process, the participation of the nurses is essential for the advance of the SMPC, as these are technically responsible for the sector, working in the management and quality of the care. As a result, the specific knowledge of the nurse in the SMPC must be valued.²²

Continuing education for the health professionals as a possible means of overcoming the difficulties

The need for actions of continuing education in health, regarding procedures relating to the process of sterilizing materials, was evidenced by professionals who assert that it is a limiting factor in overcoming the difficulties. *We always have doubts because we're not trained. [...] things happen, doubts arise, and as they come up we try to sort them out. [...] we end up learning from a colleague and learning wrong, that's how it is [...]* (T 4).

The carrying-out of actions of permanent education in health aims to reduce possible flaws occurring in the work processes, as the technical training in a specific area facilitates the workers' integration and develops the professional practice in the work environment, contributing to reflection on the importance of their work.³

It is understood that continuing education is a strategy for the individuals to reflect on their actions and the possibilities for exercising the care without fragmenting it into tasks. Through permanent education in health it is possible to obtain greater training constructed within the world of work, mediated by political, cultural and ethical values.⁶

The drop in quality, low esteem, dissatisfaction, absenteeism and high staff turnover in the SMPC are related to the lack of permanent education in health, among other reasons,¹² as the account below expresses: [...] *some attitudes, statements [...] if you don't have self-esteem, you end up feeling the lowest of the low [...]* (A 15).

Continuing education becomes part of the care process of the subject-caregiver. Thus, it is necessary for health institutions to adhere to this proposal, as well as to the personal and professional involvement of each subject. In this regard, it will be reflected in this professional's quality of life and will awake each subject's potential, resulting in productivity with quality and satisfaction from the work undertaken.²³

The SMPC is a sector with various specific characteristics, it being difficult to keep the team in synchrony; one way of preventing this situation is the carrying-out of continuous programs for training and improving the workers.¹² The participants' statements indicate the absence of institutionalized actions of permanent education in health: [...] *I learned from my colleagues, and in the day-to-day I picked it up, on the job, including material left here by the reps. They never took me and showed me the material, I didn't know [...]* (A 6).

The implementation of critical-reflexive pedagogy with methodologies which allow the problematization of situations experienced in the routine of the work is a proposal to be adhered to, as these create a space for interventions which make changes possible in the social relationship of the individual as a subject who provides care to the patient.²³

In the light of this, it is evidenced that the activities involved in the work in the SMPC can be simple; however, it is essential for the provision of quality care, and requires the union of a variety of knowledge, such as: microbiology, physiology and chemistry. For the material to be appropriately prepared, one needs to think about how that care shall be carried out.²⁰

The nursing work in SMPC has indirect care as its aim, in processing, storing and distributing articles to those who provide direct care to the patients. For this to occur, one needs work instruments, such as: equipment, materials, techniques, norms, communication skills, management, and scientific knowledge, with a view to making articles which are safe available.¹

The nurse, as the person responsible for the sector and her team, must undertake actions of permanent education in health, so as to minimize possible shortcomings in the process of cleaning, preparation, disinfection, sterilization and packaging of the articles, as these contribute risks of hospital infection for the patients.³

Remaining in this context on the proposal for permanent education in health, some factors

contribute to hindering actions, as many hospitals' financial situations lead to situations where there is a reduced number of workers, not foreseeing that people will be off work, imposing speed in the substitutions and interfering with the professionals' training. The work overload also influences the assessment of the recently-admitted patient, who should be monitored individually.²⁴

In this regard, in observing the hospitals' reality, one's attention is drawn to the selection of the professionals, which should be rigorous, bearing in mind that this sector needs technique and much responsibility, as it influences the functioning of the unit and the prevention and control of nosocomial infections.³ The professionals' reality, however, is distant from what is called for theoretically, as expressed in the account: [...] *I entered as a zero, I didn't have any experience at all, I learnt it from colleagues [...]. Some changes are not passed on. When you see, they've changed some type of system of material, and we are the last to hear about it [...]* (A 6).

The nurse must develop skills for resolving problems, proposing measures which are appropriate to the reality in the institution, optimizing the work process, and reducing costs and risks for the patients and staff. For this, it is fundamental to acquire new knowledge, with a view to reflecting on the carrying-out of scientific studies.²²

The qualified participation of the nurse in the SMPC is fundamental to foster the production of knowledge in the area, so as to promote professional transformation and growth, it being necessary to have a base in theory, pedagogy and interpersonal relationships. However, scientific production in SMPC has been scarce in recent years, while technological and scientific advances have constantly increased the quality and complexity of information.²⁵

In the light of the above, it is important to reflect that for the nurse to achieve professional valorization, and to transform her workplace into a pleasant environment, where the whole team can feel safe, she must fix her gaze on valuing the care and humanization and must be grounded in scientific research and effective actions of permanent education in health.²⁶

FINAL CONSIDERATIONS

The SMPC has a fundamental role in combatting nosocomial infections. To this end, the appropriate operationalization of this sector is necessary so as to ensure the quality of the indirect

care given to the patient. Thus, this study allowed the analysis of the work process of the nursing professionals who work in the OT and SMPC, regarding the sterilization of surgical material and professional valorization.

Considering the process of the sterilization of surgical material, it is possible to perceive that some professionals show that they had only superficial information on the stages involved in the process, because they were unable to detail them. It may be noted that doubts and insecurities emerge during the process, as does the certainty that the environment is not appropriate for the carrying-out of the work, seriously compromising the efficacy of the sterilization.

The interviewees indicate that the non-compliance of the physical environment impairs the adequate flow of the materials, due to there not existing physical barriers capable of separating the clean area from the dirty area, which results in the crossing of articles and possible contamination. In addition to this, the failure to value the work of the SMPC - which may be associated with unawareness of this sector by the units which consume its products - discourages the professionals, having a negative reflection on the quality of the indirect care given. In contrast, some professionals note that prior experience in the OT has a positive influence on the result of the work in the SMPC.

The interviews evidence the need to carry out practices of continuing education with the professionals, so as to overcome the difficulties, bearing in mind that it can reduce shortcomings in the work process, as well as encouraging a reflective attitude regarding the importance of change in the process of the work undertaken.

The importance of the nurse in the qualification of the work of sterilization of materials and in the identification of her team's needs, regarding their doubts about the work process in the SMPC, ensures the processes' efficacy, as well as contributing to the prevention of hospital infections.

This study, in demonstrating the work process and the difficulties, was able to contribute to reflection among the participants on the issue and their routine, as well as encouraging the production of knowledge in this area. Thus, the observation of some difficulties supports other reflections on the production of knowledge in this sector and aims to mobilize the subjects to implement changes in their work routine so as to overcome these weaknesses.

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