

THE NURSE'S WORK IN THE STERILE PROCESSING DEPARTMENT: AN INTEGRATIVE REVIEW

O trabalho do enfermeiro no centro de material e esterilização: Uma revisão integrativa

Trabajo de enfermería en el centro de material y esterilización: Una revisión integrativa

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ABSTRACT: Objective: To identify in the scientific literature the activities of nurses who work in the sterile processing department. **Method:** This is an integrative literature review performed by searching the databases Scopus, Latin American and Caribbean Health Sciences Literature (LILACS), Scientific Electronic Library Online (SciELO), PubMed, and Virtual Health Library (VHL). The descriptors used were esterilização/sterilization, competência profissional/professional competence, and central supply hospital associated with the keywords enfermeiro/nurse and central sterile supply. We found 1,330 articles and selected 11 of them to compose the sample. **Results:** Key aspects related to nurses' work stood out, such as sector management and development of educational activities, as well as the challenges faced by these professionals, including nonrecognition and underappreciation, lack of preparation and continuing education, occupational risks, excessive workload, low wages, and physical and mental exhaustion. **Conclusion:** We could contextualize and understand the activities and their main resulting challenges related to the development of nurses' work in the sterile processing department, thus contributing to the dissemination, recognition, and reflection on this theme.

Keywords: Nurses. Sterilization. Professional competence. Nurse's role.

RESUMO: Objetivo: Identificar, na literatura científica, as atividades do enfermeiro que atua no centro de material e esterilização. **Método:** Trata-se de revisão integrativa da literatura, com busca nas bases de dados Scopus, Literatura Latino-Americana e do Caribe em Ciências da Saúde (Lilacs), Scientific Electronic Library Online (SciELO), PubMed e Biblioteca Virtual em Saúde (BVS). Os descritores utilizados foram esterilização/sterilization, competência profissional/professional competence e central supply hospital associados às palavras-chave enfermeiro/nurse e central sterile supply. Encontraram-se 1.330 artigos, dos quais 11 foram selecionados para compor a amostra. **Resultados:** Evidenciaram-se pontos centrais referentes ao trabalho do enfermeiro, como gerenciamento do setor e desenvolvimento de atividades educativas, além dos desafios enfrentados, como não reconhecimento e desvalorização, falta de preparo e de educação permanente, riscos ocupacionais, carga horária de trabalho excessiva, má remuneração e desgastes físico e mental. **Conclusão:** Foi possível contextualizar e compreender as atividades e os principais desafios delas decorrentes no desenvolvimento do trabalho do enfermeiro no centro de material e esterilização, contribuindo, dessa forma, para a divulgação, o reconhecimento e a reflexão a respeito da referida temática. **Palavras-chave:** Enfermeiros e enfermeiras. Esterilização. Competência profissional. Papel do profissional de enfermagem.

RESUMEN: Objetivo: Identificar, en la literatura científica, las actividades de enfermeros que trabajan en el Centro de Material y Esterilización. **Método:** Esta es una revisión de literatura integradora, que busca en las bases de datos SCOPUS, Literatura Latinoamericana y del Caribe en Ciencias de la Salud (LILACS); Biblioteca científica en línea electrónica (SCIELO), PubMed y biblioteca virtual de la salud (BVS). Los descriptores utilizados fueron esterilización/sterilization, competencia profesional/professional competence, asociados a las palabras clave enfermeiro/nurse y centro de suministros estériles/central sterile supply. Se encontraron 1.330 artículos, de los cuales 11 fueron seleccionados para componer la muestra. **Resultados:** se evidenciaron puntos centrales relacionados con el trabajo de la enfermera, como la gestión del sector y el desarrollo de actividades educativas, además de los desafíos enfrentados, como la falta de reconocimiento y apreciación, la falta de preparación y educación permanente, los riesgos laborales, la carga de trabajo excesiva, mal pago y agotamiento físico y mental. **Conclusión:** fue posible contextualizar y comprender las actividades y los principales desafíos derivados de ellas en el desarrollo del trabajo de la enfermera en el centro de materiales, contribuyendo así a la difusión, reconocimiento y reflexión sobre este tema. **Palabras clave:** Enfermeras y enfermeros. Esterilización. Competencia profesional. Rol de la enfermera.

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INTRODUCTION

The Sterile Processing Department (SPD) is the sector responsible for the processing of healthcare products (HPs), whose aim is to provide properly processed materials for healthcare services. In this sector, the processes of recycling, cleaning, sterilization, inspection, packaging, and distribution of materials for the various consumer units take place^{1,2}.

The SPD plays a crucial role in ensuring that HPs are sterilized and delivered with excellent quality, favoring clean care and the reduction in rates of healthcare-associated infections (HAIs)³. The sector provides indirect patient care, supplying safe medical devices, which will contribute to direct care. Its main objectives are the processing, storage, and distribution of materials, a context that involves the duties of nurses within this work environment⁴.

The nurse is responsible for managing and operationalizing all stages that compose the processing of materials, in addition to supervising the activities of the nursing team working in the sector⁵. In this sense, nurses' performance requires specific knowledge of the various equipment, medical commodities, surgical instruments, and how to process them, as well as the management of the SPD^{6,7}.

Nurses' competence in the performance of their activities ensures the effectiveness of the SPD processes, in addition to collaborating with the prevention of HAIs. However, the importance of their work in the nursing team needs to be continuously highlighted, discussed by the team, and presented to the other units of the institution, in such a way that these professionals can receive their due recognition and no longer remain invisible⁸.

Thus, the development of new studies on the work of nurses in the SPD is justified, with emphasis on their assignments, activities, and the relevance of their work, as well as the challenges faced when performing their duties.

OBJECTIVE

To identify in the scientific literature the activities of nurses who work at the SPD.

METHOD

This is an integrative literature review, performed according to the following steps: definition of the problem

and the guiding question, establishment of criteria for inclusion and exclusion of studies, search for articles in the literature and their critical evaluation, interpretation and discussion of results, and presentation of the review⁹. The guiding question of this study was: what are the activities performed by nurses working in the SPD?

The databases used to search for the articles were: Scopus, Latin American and Caribbean Health Sciences Literature (LILACS), Scientific Electronic Library Online (SciELO), PubMed, and Virtual Health Library (VHL). We used terms *esterilização*/sterilization and *competência profissional*/professional competence in the Health Sciences Descriptors (DeCS), and central supply hospital in the Medical Subject Headings (MeSH), associated with the keywords *enfermeiro*/nurse and central sterile supply, and combined with the Boolean operator AND and/or OR, aiming to obtain the highest possible number of results. The following combinations were searched: *enfermeiro*/nurse AND *esterilização*/sterilization; nurse AND central supply hospital OR central sterile supply.

For the sample composition, we applied the following inclusion criteria: articles written in Portuguese, English, or Spanish, with no limitation on publication date, addressing the work of the nurse in the SPD, and available in full text. The exclusion criteria were: publications concerning workers' health, as well as dissertations, theses, editorials, integrative reviews, repeated articles, and articles unrelated to the theme of this study.

The analysis of the articles was initially based on the reading of the title and the abstract. Subsequently, the selected studies were analyzed with an adapted instrument that provided information regarding the identification of the articles (title, authors, year of publication, name of the journal), methodological description, and level of scientific evidence, as proposed by Melnyk and Fineout-Overholt¹⁰.

With respect to the level of scientific evidence, we used the following classification:

1. Evidence from a systematic review or meta-analysis of all relevant randomized controlled trials or clinical guidelines based on systematic reviews of randomized controlled trials;
2. Evidence produced by at least one well-designed randomized controlled trial;

3. Evidence from well-designed trials without randomization;
4. Evidence from well-designed cohort and case-control studies;
5. Evidence resulting from a systematic review of descriptive and qualitative studies;
6. Evidence obtained from a single descriptive or qualitative study;
7. Evidence from respected authorities' opinions and from expert committee reports¹⁰.

The search resulted in a total of 1,330 articles, of which we excluded 1,225 after reading the title and abstract, as they did not answer the guiding question, and 90 because they were repeated; hence, 11 articles remained in the final sample. Figure 1 describes the process of searching and selecting articles in the databases.

RESULTS

The 11 selected articles were published from 2004 to 2019, with the highest incidence in 2006 (n=2) and 2013 (n=2). All articles were conducted in Brazil, with level 6 of scientific evidence, with prevalence of qualitative and descriptive studies. Most studies aimed at analyzing and understanding the nurses' work process in the SPD and/or outlining their assignments and activities.

Table 1 presents information about the publications, including title, authors, year of publication, objectives, journal, database, methodological description, and level of scientific evidence.

Table 2 describes the management, educational, and support activities of nurses who work in the SPD in categories listed according to the analysis of the studies.

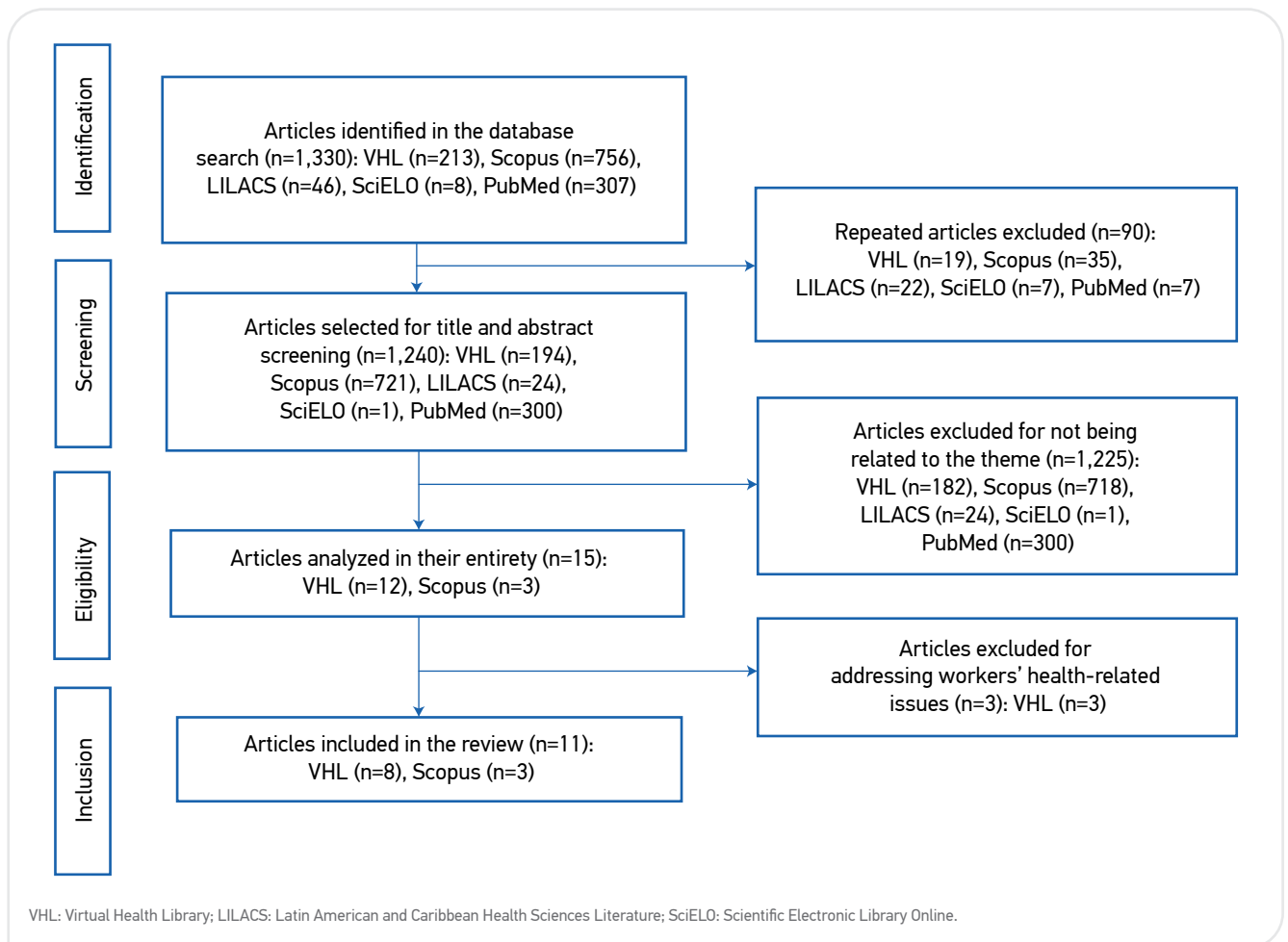


Figure 1. Flowchart of data search.

Table 1. Article description. Sobral, CE, Brazil, 2020.

n	Title	Author(s)/Year of publication	Objectives	Journal/Type of study/Database/ Level of evidence
1	"Investigation in Central of Material and Sterilization using Grounded Theory"	Pezzi and Leite, 2010. ¹¹	To identify the meaning of the management practice in a sterile processing department for nurse managers/supervisors of this unit concerning human resources; to describe the nurse management process regarding human resources from the perspective of nurse managers/supervisors of the SPD; to create a theoretical model for human resource management.	<i>Revista Brasileira de Enfermagem / Qualitative Research / VHL / Level 6</i>
2	"Logistics of a surgical block implementation in the forest: the nurse's role"	Sales et al., 2016 ¹²	To report the experience of volunteer nurses at the Civil Society Organization of Public Interest <i>Expedicionários da Saúde</i> during the implementation of the surgical center and the sterile processing department of a field hospital in an indigenous village in Northern Brazil.	<i>Revista SOBECC / Experience Report / VHL / Level 6</i>
3	"Nursing tasks in the material storage center of hospital institutions"	Gil et al. 2013 ¹³	To identify the activities of nurses in the sterile processing department of hospitals, according to the activity profile and frequency of performance.	<i>Revista Texto e Contexto Enfermagem / Descriptive cross-sectional study / VHL / Level 6</i>
4	"Nursing activities in central supply and sterilization: A contribution to personnel design"	Costa and Fugulin, 2011 ¹⁴	To identify and validate the activities performed by the nursing team in sterile processing departments to help define the unit's workload.	<i>Revista Acta Paulista de Enfermagem / Methodological Study / Scopus / Level 6</i>
5	"Nurse's role in cleaning process at a material and sterilization center"	Strieder et al., 2019 ¹⁵	To contextualize the role of nurses in the process of cleaning hospital materials in a sterile processing department.	<i>Revista SOBECC / Experience Report / VHL / Level 6</i>
6	"The nursing working process at the material and sterilization center: perceptions of undergraduate students"	Taube et al., 2008 ¹⁶	To identify how undergraduate students perceive the working process of the nurse in the sterile processing department.	<i>Revista Ciência, Cuidado e Saúde / Qualitative Descriptive Study / VHL / Level 6</i>
7	"Nursing in the process of sterilization of materials"	Ouriques and Machado, 2013 ¹⁷	To analyze the work process of nursing professionals working in the surgical center and the sterile processing department as to the sterilization of surgical materials in a public hospital in Porto Alegre (RS), Brazil.	<i>Revista Texto e Contexto Enfermagem / Descriptive exploratory research / Scopus / Level 6</i>
8	"Nursing at the sterilized material center – continuing education practice"	Souza and Ceribelli, 2004 ¹⁸	To characterize the continuing education practices offered to the staff involved in nursing activities at sterile processing departments of hospitals located in the micro-region of São José dos Campos (SP), Brazil.	<i>Revista Latino-Americana de Enfermagem / Qualitative descriptive study / VHL / Level 6</i>
9	"The nurse work process in the center of material and sterilization"	Taube and Meier, 2007 ²⁰	To describe the group perception of nurses about elements of their work process in the sterile processing department.	<i>Revista Acta Paulista de Enfermagem / Qualitative descriptive study / Scopus / Level 6</i>
10	"The nurse of the Material and Sterilization Center and the perception of his social role"	Bartolomei and Lacerda, 2006 ²¹	To understand how nurses work in the sterile processing department and organize themselves as a social group, perceiving their social roles and relating them both to the dominant health care structure and to the identifying nature of nursing – the care process.	<i>Revista Gaúcha de Enfermagem / Qualitative study / VHL / Level 6</i>
11	"The nurse's work at a hospital supply center and his/her place in the care for nursing work"	Bartolomei and Lacerda, 2006 ²²	Study on nurses' work at the sterile processing department aiming at analyzing their social reality and transforming role in the care process in health and nursing.	<i>Revista da Escola de Enfermagem da USP / Strategic research with discourse analysis / VHL / Level 6</i>

SOBECC: Brazilian Association of Nurses in Surgical Center, Anesthesia Recovery and Center for Material and Sterilization; VHL: Virtual Health Library; USP: Universidade de São Paulo.

Table 2. Description of activities performed by nurses in the sterile processing department.

Category	Activities	Articles
Management activities	Management and coordination of the work process in the unit	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
	Human and material resource management	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
	Supervision of activities carried out in the unit	1, 2, 3, 4, 6, 7, 8, 9
	Definition of the work schedule in each work unit of the nursing team	2, 3, 4, 5, 6, 7, 8
	Supervision of the operation of equipment used in each work unit	2, 3, 4, 6, 7
	Monitoring of tests carried out with products, inputs, and equipment	1, 3, 4, 6
	Supervision and control of receipt of consigned materials	3, 4, 6
	Supervision and control of the use of consigned materials	3, 4
	Supervision and control of return of consigned materials	3, 4
	Confirmation of the daily surgery schedule, verifying the delivery of consigned materials	3, 4
	Confirmation of the surgery schedule, verifying the availability of sterile materials and clothing	3, 4
	Inspection of the sterilization control documentation	1, 3, 4, 6
	Monitoring and control of the supply of sterile materials and clothing	3, 4, 6
	Monitoring and evaluation of maintenance of materials and equipment	1, 3, 4, 6
	Monitoring and evaluation of equipment quality and validation	1, 3, 4, 6
	Participation in administrative and management meetings involving the unit	1, 3, 4
	Monitoring the evaluation of quality indicators in the unit	1, 2, 3, 4
	Managing productivity control in the unit	1, 2, 3, 4, 6
	Problem solving	2, 3, 4, 5, 8
Preparation of protocols	1	
Educational activities	Monitoring, planning, and promotion of training programs	1, 2, 3, 4, 5, 10
	Participation in programs, commissions, courses, and events involving the unit	3, 4, 10
	Participation in the evaluation of employees' performance	3, 4, 5, 10
	Research development	3, 4
	Participation in the definition of programs to prevent occupational risks and promote the safety of workers	1, 2, 3, 4, 5, 7
Support activities	Providing support to consumer units, with distribution and receipt of their materials	1, 3, 4
	Providing indirect patient care	1, 2, 3, 8, 9

DISCUSSION

The bibliographic survey evidenced the central axes of the nurses' work in the SPD, such as the management of the sector and the development of educational activities. In addition, we could identify some of the challenges faced by these professionals.

The role of nurses in the SPD begins in the unit planning stage, as they are responsible for choosing the appropriate material and human resources for the activities performed in the sector. Nurses must select, train, and allocate the staff,

considering the operationalization and activities carried out in the unit^{11,12}.

These professionals play a key role, from the planning and organization stages to the execution of work, guaranteeing the systematic operationalization of processes involving storage, conservation, distribution, transportation, and handling of equipment and materials, aiming to maintain the integrity of the products, their shelf life, and quality in order to ensure patient safety regarding the provided care¹².

According to studies, the managerial work of nurses in the SPD involves several activities such as: coordination of

the work process in the unit; supervision of activities carried out in the unit; definition of the work schedule in each unit of the nursing team; monitoring of the team's performance; supervision of the operation of equipment used in each work unit; inspection of the sterilization control documentation; monitoring of tests carried out with products, inputs, and equipment; confirmation of the daily surgery schedule, verifying the delivery of consigned materials; participation in administrative and management meetings involving the unit; monitoring the evaluation of quality indicators in the SPD^{13,14}.

In this context, management is one of the main tasks of nurses and comprises several functions, such as planning and structuring of services, elaboration of administrative and operational instruments, and administration of human and material resources. The immediate purposes of the administrative activities conducted by nurses consist of organizing and controlling the work process, while the mediate purpose consists of facilitating the care in order to provide the patient's cure¹³.

Concerning the management of human resources, we underline that the nurses' work involves humanistic values, personal and professional commitment, technical-scientific knowledge, understanding of human relations, and dedication to the health of individuals indirectly assisted, thus consisting of a challenging work of great responsibility^{11,12}. As team coordinators, nurses seek to integrate the other professionals by favoring interpersonal relationships and strengthening teamwork, which contributes to the competent practice at all stages of the SPD work process, providing safe and quality care^{15,16}.

The management of material resources also stands out, especially when considering the increase in technological devices. The nursing team provides several products for the various consumer units, such as emergency room, outpatient clinics, surgical center, obstetric center, and intensive care unit. The nurses' management is paramount and must be resolute and effective to avoid possible errors in the many operational processes¹³.

Activities related to the supervision of equipment operationalization are among the tasks of nurses in the SPD, which are mentioned in the studies. They require knowledge of the equipment and its proper operation, as well as staff training, to ensure that the care provided to patients is reliable and safe^{13,14}.

Moreover, studies indicate that nurses perform educational activities, including: monitoring, planning, and promotion of training programs; participation in programs, commissions,

courses, and events involving the SPD unit; participation in the evaluation of employees' performance. Nurses are responsible for carrying out educational activities, through continuing education, seeking to qualify the team to perform their tasks rationally and competently, aiming at minimizing potential failures in the process of cleaning, preparation, disinfection, sterilization, and storage of HPs^{11,13,14,17,18}.

Research development is another task mentioned, considered an important activity for the improvement of the SPD work process; however, authors pointed out the nurses' low participation in this activity, which constitutes a hindrance to the improvement, valorization, and dissemination of the work developed by nurses at the SPD¹³.

Therefore, the challenges faced by nurses and their team in the unit include nonrecognition, underappreciation, and lack of preparation and continuing education, which contribute to low self-esteem, dissatisfaction, professional ineptitude, and high turnover in the sector. In addition, some situations related to characteristics of the work process and organization involve physical, chemical, biological, and ergonomic risks, deficiencies in structural organization, nurses who have two or more jobs, excessive workload, low wages, and physical and mental exhaustion, which predispose professionals to diseases and may compromise their health and quality of life^{11,17,19}.

The literature has no studies on the reasons why nurses choose to work in the SPD or the historical evolution of their work process in this care field, but the challenges faced by these professionals and the lack of direct care to the patient may be the main factors that discourage nurses from working in this unit.

We also emphasize that nurses recognize the importance of their work in the SPD and are concerned with the social representation of the unit, mainly because they do not receive due recognition for the development of this process of living care in the act, guided by light, hard-light, and hard technologies, which contribute to the direct care and ensure the safety of procedures and interventions provided to patients^{20,21}.

A study points out the nurses' difficulty in defining the elements of the SPD work process, especially regarding the work object and the final product. In this sense, the work process of nurses in this sector involves management, care, teaching, and research, which allows them to work with different work objects, i.e., material and human resources, transforming them into indirect patient care and making the characterization of this work process and the measurement of its results complex²².

Studies reveal that, although the activities performed by nurses in the SPD remained similar over the years, they have improved, with these professionals mastering scientific evidence and management and systematizing tools related to the work process, thus optimizing the operationalization of the support provided in the SPD in a qualified, integrated, collaborative, and efficient manner.

Therefore, we emphasize that the work of nurses in the SPD is both challenging and crucial for the quality of health care directly and indirectly provided. Hence, nurses must ground their work in updated competencies and skills, with human, ethical, and technical-scientific basis, seeking to contribute to the full potential of the nursing team in the various healthcare practices^{6,13}.

To that end, they need adequate working instruments and conditions, such as appropriate physical structure, fair wages, quality equipment and materials, protocols and standards, effective communication skills, balanced staff allocation, competent management, and scientific knowledge^{13,23}. The qualified participation of nurses in the SPD and in the discussion of issues relevant to health care is paramount for producing knowledge in the field, assisting in professional growth and the transformation of reality in order to gain appreciation¹³.

Taking this into consideration, we must promote the work of nurses at the SPD to make it visible, recognizing its importance and demonstrating that their activities are not merely limited to cleaning materials, but also involve specific scientific knowledge to be carried out with dexterity, in

addition to effectively collaborating with the care provided by all professionals.

CONCLUSION

The results of this literature review allow contextualizing and understanding the work of nurses at the SPD. Among the main tasks of professionals working in the sector are the management and coordination of the SPD work process; management of human and material resources; participation in administrative and management meetings involving the SPD; monitoring the evaluation of quality indicators in the unit; monitoring, planning, and promotion of training programs; and participation in programs, commissions, courses, and events involving the unit.

Therefore, we expect to foster the role of nurses and other professionals working at the SPD, thus helping them gain visibility and receive due recognition and appreciation. Furthermore, we intend to provide evidence on the subject both for professional practice and for nursing training.

We suggest the development of new studies seeking to investigate the motivational factors of professionals for working in the SPD, which address the historical evolution of the nurses' work in the SPD, as well as interventionist research, aiming to identify and fulfill the professionals' needs for qualification and continuing education.

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