

<http://dx.doi.org/10.1590/0104-07072018004880016>

STRUCTURAL CAPITAL IN THE NURSING MANAGEMENT IN HOSPITALS¹

Ana Lúcia Arcanjo Oliveira Cordeiro², Josicélia Dumêt Fernandes³, Maria Deolinda Antunes Luz Lopes Dias Maurício⁴, Rosana Maria de Oliveira Silva⁵, Cláudia Silva Marinho Antunes Barros⁶, Cátia Maria Costa Romano⁷

¹ Article extracted from the thesis - Intellectual Capital in Nursing Care Management in Hospital Organizations, presented at the Nursing Graduate Program, Federal University of Bahia (UFBA), in 2015.

² Ph.D. in Nursing. Professor, School of Nursing, UFBA. Salvador, Bahia, Brazil. E-mail: anaarcanjo@hotmail.com

³ Ph.D. in Nursing. Professor, School of Nursing, UFBA. Salvador, Bahia, Brazil. E-mail: dumet@ufba.br

⁴ Ph.D. in Nursing. Professor, Escola Superior de Enfermagem de Lisboa. Lisboa, Portugal. E-mail: dluz@esel.pt

⁵ Ph.D. in Nursing. Professor, School of Nursing, UFBA. Salvador, Bahia Brazil. E-mail: rosanaosilva@hotmail.com

⁶ Ph.D. in Nursing. Professor, School of Nursing, UFBA. Salvador, Bahia, Brazil. E-mail: marinho-claudia@hotmail.com

⁷ Ph.D. in Nursing. Professor, School of Nursing, UFBA. Salvador, Bahia, Brazil. E-mail: catia.romano4@gmail.com

ABSTRACT

Objective: to describe how nurses use the components of the structural capital in management in hospitals.

Method: exploratory, descriptive study with a qualitative approach. Data were collected in five public, four private and three philanthropic hospitals from October 2014 to May 2015. A semi-structured interview was used with 12 nursing managers in coordination, management, and direction and support assistance positions of the nursing services. The data were analyzed according to content analysis and organized in the category of Operational Process Management, with two subcategories: Care Technology and Administrative Technology.

Results: nurses used the components of the structural capital to create the care technology, by applying new ideas and perfecting processes, models, and protocols. To produce the administrative technology, inclusion of strategic action plan, diverse committees, development and the use of indicators in the care and administrative processes were required. Also, valuing ideas for innovation in the service, maintenance of relationship with suppliers, cost management, use of electronic system and meetings for sharing knowledge were also mentioned.

Conclusion: the managers use and develop new managerial actions for the development of the organizations' structural capital. In order to improve them, investments and strategies are needed to identify the components that need to be optimized for their use and development, as the effectiveness of one component requires a high level of alignment and integration with the others.

DESCRIPTORS: Organization and administration. Nursing. Hospitals. Technology. Organizational innovation.

CAPITAL ESTRUTURAL NA GESTÃO DAS ENFERMEIRAS EM HOSPITAIS

RESUMO

Objetivo: descrever como os componentes do capital estrutural são utilizados na gestão de enfermeiras em organizações hospitalares.

Método: estudo exploratório, descritivo, com abordagem qualitativa. A coleta de dados foi realizada em cinco hospitais públicos, quatro hospitais privados e três hospitais filantrópicos, no período de outubro de 2014 a maio de 2015. Foi utilizado um roteiro de entrevista semiestruturada com 12 gestoras de enfermagem, que ocupavam cargos de coordenação, gerência, direção e assessoria dos serviços de enfermagem. Os dados foram analisados segundo a análise de conteúdo e organizados na categoria Gestão de Processos Operacionais, com duas subcategorias: Tecnologia Assistencial e Tecnologia Administrativa.

Resultados: os componentes do capital estrutural foram utilizados pelas enfermeiras para criar a Tecnologia Assistencial, ao aplicar novas ideias e ao aperfeiçoar processos, modelos e protocolos. Para produzir a Tecnologia Administrativa, foi necessário englobar plano de ação estratégico, comissões diversas, construção e utilização de indicadores nos processos assistenciais e administrativos. Ainda, a valorização de ideias para inovação no serviço, manutenção de relação com fornecedores, gestão de custos, utilização do sistema informacional e reuniões para compartilhar conhecimentos foram igualmente citadas.

Conclusão: as gestoras utilizam e elaboram novas ações gerenciais para o desenvolvimento do capital estrutural das organizações. Para aperfeiçoá-las, são necessários investimentos e estratégias que identifiquem os componentes que precisam ser otimizados quanto a sua utilização e ao seu desenvolvimento, uma vez que um componente, para ser efetivo, precisa ter alto nível de alinhamento e integração com os demais.

DESCRIPTORIOS: Organização e administração. Enfermagem. Hospitais. Tecnologia. Inovação organizacional.

CAPITAL ESTRUCTURAL EN LA GESTIÓN DE LAS ENFERMERAS EN LOS HOSPITALES

RESUMEN

Objetivo: describir cómo los componentes del capital estructural son utilizados en la gestión de enfermeras en las organizaciones hospitalarias.

Método: estudio exploratorio, descriptivo y con un abordaje cualitativo. La obtención de datos se realizó en cinco hospitales públicos, cuatro hospitales privados y tres hospitales filantrópicos, entre Octubre del 2014 y Mayo del 2015. Se usó una guía de entrevista semiestructurada con 12 gestoras de enfermería que ocupaban cargos de coordinación, gerencia, dirección y asesoría de los servicios de enfermería. Los datos fueron analizados según el análisis del contenido y organizados en la categoría Gestión de Procesos Operacionales, con dos subcategorías: Tecnología Asistencial y Tecnología Administrativa.

Resultados: los componentes del capital estructural fueron usados por las enfermeras para crear la Tecnología Asistencial al aplicar nuevas ideas y perfeccionar procesos, modelos y protocolos. Para producir la Tecnología Administrativa fue necesario englobar un plan de acción estratégico, comisiones diversas, construcción y utilización de indicadores en los procesos asistenciales y administrativos. Además, fueron igualmente citadas la valorización de ideas para la innovación en el servicio, mantenimiento de la relación con los proveedores, gestión de costos, utilización del sistema informacional y reuniones para compartir los conocimientos.

Conclusión: las gestoras utilizan y elaboran nuevas acciones gerenciales para el desarrollo del capital estructural de las organizaciones. Para perfeccionarlas son necesarias inversiones y estrategias que identifiquen los componentes que precisan ser optimizados sobre su utilización y desarrollo ya que un componente precisa tener alto nivel de alineamiento e integración con los demás para ser efectivo.

DESCRITORES: Organización y administración. Enfermería. Hospitales. Tecnología. Innovación organizacional.

INTRODUCTION

Structural Capital (SC) is the infrastructure that supports professional practice and enables functioning of an organization, such as methods, databases and networks, processes, technologies, patents and franchises. It requires efficient management to effectively gather, test, organize, refine and distribute the existing knowledge in the service for innovation.¹

Considering this definition, knowledge must be strategically managed to leverage the ability to innovate and foster the development of new solutions for the organization and the professional activities, which are in rapid and constant transformations. Thus, focusing on innovation should be adopted by direct and indirect managers and employees, who are part of the organization's businesses.²⁻⁵

The planned use of SC in management by nurses helps expand the development, innovation and consequent economic and social value of the hospital. In this regard, the production of nursing work legally belongs to this organization as an element of its SC. It includes structures, systems, routines, organizational procedures and technological innovations.

Nurses produce organizational assets in their professional practice by searching for new products and processes, and wish to create technologies, invent or reinvent, and patent products and processes. However, these assets are still poorly explored in nursing, and there is no interest in patenting their technology, generated by their creativity, which is

common in improvisations that have been remarkable throughout their history.⁶

In this context, nursing can use and produce soft-hard and soft technologies. Regarding hard technologies, i.e., the industrialized ones, nurses are traditionally consumers, with low participation in their development. Soft-hard technologies encompass structured knowledge, theory, and models, whereas soft technologies includes the forms established in the relationship with the and client welcoming.⁷ Thus, the activities developed by nurses are permanent sources of innovation, using qualified labor, generating a direct impact on the basis of the organizational productivity.

By adopting innovative practices, management of the nursing service enhances the organization's competitiveness in the business scenario, improving the quality of goods and/or services, and increases the productive capacity and quality of life of employees and clients.⁸

Thus, it is relevant to describe and analyze the use of SC components by nurse managers, by questioning: how do nurse managers use SC components in hospital organizations? To answer this question the study aimed to describe how nurse managers use SC components in hospital organizations.

This research is justified by its innovative aspect in the context of nursing management, standing out due to its relevance to the understanding and use of SC management, a current topic within organizations and consolidated as a competitive strategy in the business world.²⁻⁵

METHODS

This was a qualitative study that describes and interprets the experiences of nurse managers from nine hospitals in the city of Salvador (BA), North-eastern Brazil, about the use of SC components in professional practice.

Thirty-two nurses were recruited to this study, due to their manager positions in the hospitals of Salvador during the period of data collection, October 2014 to May 2015. After identifying and locating the managers, invitations were sent by e-mail and social networks; the research intent and aims were explained, as well as the importance of participating in the study. Twelve nurses did not reply; two were not available to participate; two were on vacation; one was on maternity leave; and three waited for the hospital's ethics committee's approval to participate but they did not respond to the invitation even after approval by the committee.

Thereby, 12 nurses were interviewed, by using the information saturation criterion for finalizing the searching of participants. The interview were performed with nurses of five public hospitals, four private hospitals and three philanthropic hospitals, in management positions of nursing services, including coordinators, managers, directors and advisors, working for at least six months in that position, because after this period they would already be integrated into the organization, more confident in the management process related to the institutional policies. The mean time in the management position ranged from 5.8 to 10 years.

The interview script consisted on two parts, the first one with sociodemographic information; and the second, with the following questions: describe how you use the following SC components in administration: process/product improvement, technology, efficiency/effectiveness/management, and communication/database process. During the process, doubts regarding the terms were explained when necessary to meet the purposes of the study, facilitating the fluidity of the reports.

The interviews were recorded with the participants' acquiescence; in order to copy register every information. These interviews lasted, on average, 30 minutes and were performed in an exclusive room in a place chosen by interviewees. Apparently, the interviewees were comfortable reporting their experiences as managers in each component. At the end of the interview, the recordings were heard and validated by the participants.

The data were analyzed according to content analysis by following three stages: pre-analysis, material exploration and treatment of data.⁹ In the first stage, free floating reading of the interview content was performed to constitute the *corpus*. Subsequently, in the second stage, data were clustered after a saturation point, as determined by the use of the whole content of the interviews, the representativeness, expressing the components of the SC, and the homogeneity of the interviews, in seeking their similarities and pertinence of the content to the research objectives. Then, breaking of the elements, encoding and categorization and enumeration of the units were performed, which were grouped into one category and two subcategories by similarity for organization of information and analysis. The saturation point of the data was reached when the information started repeating without new elements being identified that added properties to the analysis category. The third and last stage of the content analysis was conducted through interpretation of the results and synthesis of the analysis.

The study was approved by the Research Ethics Committee, protocol n. 812.679, September 30, 2014, CAAE 36373614.3.0000.0048, and met the guidelines and norms that regulate research involving human beings, established by Resolution 466/2012 of the National Health Council. Participants read and signed the Terms of Free and Informed Consent Forms in two copies, after receiving information and all explanations about the study. The interviewee was given one copy and the researcher kept the second one. The identity of the manager was preserved by using the alphanumeric system M (for manager), followed by the number, according to the order of occurrence of the interviews from M1 to M12.

RESULTS

The managers used the components of the SC: process/product improvement, technology, efficiency/effectiveness/management, communication process/database for the management of the required activities in the nursing service to perform customer care, and identified in the category of operational process management, from which two subcategories emerged, namely: Care technology and Administrative technology.

Assistive Technology

The managers stated using and producing technologies that represented innovation for the care

process in the organization, namely: the application of new ideas, derived from knowledge and validated experiences, and the adoption of best practices; and the improvement of processes, care models and protocols: *we are always innovating. Right now, we are trying to adjust some forms, apply some scales [...] of assessment and prevention [...] the one on patient safety, falls, patient positioning, we are trying to use these care methods, we are in this process (M9). Evidence-based practices that we, but there are good practices that even the employees, the nursing technician, the bedside nurse, suggest [...] development of new actions to improve the nursing practice [...](M4).*

Improvement of processes, implementation of programs, elaboration, protocol implementation and updating were innovative technologies reported by managers: *production of technology was developed by nurses [...] we implemented quality programs, organizational environment, interpersonal relationships, monthly meetings, [...](M1). [...] Clinical guidelines are also developed by nurses and, in addition to all of this, we monitor and follow-up ... the care model protocols were developed by nurses, which reinvigorated all the institutional protocols (M3).*

The managers used hard technology to expedite the care process, as exemplified in the statements: *[...] we reduced the nursing technicians' hours... they monitor blood glucose at the bedside, and the result automatically pops up in the monitor [...] with the device, we do all this process without demanding that much time (M4). The monitors are now integrated with the electronic area, and then, they will also change the nursing work process, because of a new technology [...](M7). Technology in a public hospital [cites the hospital] is a pioneer. I think it does everything, we just do not have an MRI, but exams and procedures, we perform everything, we do not have problems with technology (M9).*

Administrative Technology

Administrative Technology, used and developed by nurses in the management of operational processes, encompassed knowledge and skills to optimize the service and achieve organizational goals, as a decentralized management model with technical advice; strategic action plan and several committees; use of indicators in nursing care and administrative processes; openness, valuing of professionals' ideas and attitudes in problem-solving for innovation in the service; communication process with formal face-to-face meetings for decision-making; relationship with suppliers; cost management and use of the electronic communication system,

already implemented or under implementation.

The excerpts from the statements exemplify the experiences of the managers in using administrative technology: *my managing is totally decentralized. I do not have a corporate management [...] I have technical advice; I have 24-hour administrative supervision, always a supervisor within the hospital who answers all technical and administrative issues in the 24 hours (M9). I do use the action plan, which is a more strategic thing [...]. We have Infection Control Committees, article processing committee, which we did not have and was implemented; patient chart and discharge review committee, ethics committee, we have made all those committees really work (M11). We work with committees in nursing, linked to the general nursing coordination, these committees are ... the reference for caring, in order to bring evidence, showing good practices and also disseminating good practices with the team [...](M4).*

The managers used indicators developed by nurses for the evaluation of care and administrative processes, which guided periodic analysis of actions for decision making, continuous improvements and resolution of administrative problems, as shown by these statements: *we have been working with indicators and monitoring [...] we evaluate the indicators monthly, both the care and the administrative indicators [...] (M3). We see by means of indicators [...] it is organized [...] to evaluate those indicators, to know how to take new ideas from there, to make plans of action, and the thing of continuous improvement (M5).*

Cost management with awareness of waste minimization, financial survival of the hospital, relationship with suppliers in the acquisition of materials and cost-benefit analysis of the inputs were part of the operational process: *nurses participates a lot in this process of financial survival of the hospital [...] be zealous, aware of what waste is (M2). The implementation of all disposable material was conducted by assessing the cost-benefit analysis (M8). We have partnerships with the supplier; so every Friday morning I have an appointment with them [...] I analyze the entire proposal, and refer it to the supplies center [...] through the Purchase Committee for analysis of the economic viability [...] (M4).*

The openness and appreciation of ideas and attitudes from professionals working in innovation and problem solving were exemplified as follows: *[...] both the technician and the nurse, if the person is facing a problem, they'll also seek a solution to the problem; then, most of the time, this innovation arises from that employee's attitude (M5). [...] I choose that professional that works well, and if that knowledge is not yet standardized, then I start from it, so that we can standardize it (M6).*

The formal face-to-face meetings were used by managers to communicate with the nursing team, to share decision-making: *the meeting is a reason for us to sit down, schedule something new, socialize, if that is for group development, if not, we solve it right away [...]* (M9). *All areas have an action course, and in a meeting we discuss, study and decide how to implement these actions; then the entire coordinating group gathered [...]* *an action applied in one place can be applied in the other [...]* *it is taken to the whole team [...]* (M11).

The electronic communication system is implemented or under implementation in some managers' hospitals. The lack of electronic patient records and computers in all care units was reported. In the setting that was most advanced in terms of implementation, the computerized nursing appointments and the database that generates statistical information on patient flow and occurrences stood out. *The patient record is not yet electronic; the nursing appointments, the vital signs, the patient map for identification of patients' flow in the hospital are computerized* (M11). *[...] We have a computer logistics issue here ... we do not have electronic records; we do not have a computer in all units* (M9).

The documentation of the hospital infection control committee is all done in database [...] *and the group has access to this database, and then we generate the incidence of infection, non-infectious complications [...]* *I have this information in the database [...]* *I also search the communication process; we have improved a lot; the effective communication protocol is now launched* (M11).

DISCUSSION

The SC components are used in the managers' practices of this study in the management of the operational processes, which include the management of a set of activities required in the nursing service to assist the client. In the administration of these operational processes, the production of care and administrative technologies in the nursing service are evident.

When the continuous improvement in the health system is advocated, it should not be dissociated from technological innovation. Continuous improvement of the existing knowledge in the organizations produces new knowledge and drives the culture of innovation, generating technology with several levels of products and processes changes.¹⁰

The nursing service is a source of innovation, resulting from problem solution and the use of human capital management strategies, based on the application of professional knowledge that is useful

for the organization, health and professional development. Thus, it is evident that the needs emerging in the daily work and the decision-making capacity of the talents, combined with the space offered for creativity and initiative, can increase innovation.

Nursing is an innovative field of scientific and technological knowledge, socially committed to the public policies of the Unified Health System (SUS). Thus, accelerating the production of technology is a challenge for the Brazilian nursing.¹¹ A retrospective study of 100 years of nursing history identifies the tradition of nurses to innovate by creating and diffusing tangible devices that have changed care.⁶

Therefore, care technologies developed and managed by nurses encompass knowledge and skills used in the development of knowledge and processes that influence care. The use of technology in nursing makes care safer and more efficient, reduces time and improves communication.¹² There is a consensus among professionals on the vast benefits provided by technological development, but they do not always occur because of the risks arising from their access. Therefore, the production of technology must be more resolute, accessible for all the people involved and capable of improving health care.¹³

In this context, this technological development is not restricted to the hospital - admittedly an environment where high technological density predominates. However, it also occurs in the Basic Health Unit (UBS), whose theoretical and political principles go beyond the hegemonic, biology-centered conception of thinking and producing care for the attainment of integrality.¹⁴⁻¹⁵ The technology used in the primary care is soft, configuring the relationship between innovative or instituting subjects of great importance for the quality of care and, therefore, it only has materiality while acting (living work). Consequently, according to the context, a level of complexity higher than the hospital can be achieved and should not be underestimated.¹⁶

The managers stated that they implement programs, improve processes and develop protocols in the hospital. The implementation of programs drive the actions to be executed as a technical model of intervention to produce care, requiring planning as a working proposition. For example, the Quality, Certification and Hospital Accreditation Program guide the adequacy of care, administrative, teaching and research processes, as well as provide changes in the professional's performance, offering safety in their activities and improving processes for customer service.¹⁷ The improvement of processes in nursing

management is mandatory to monitor technological evolution, changes in the organizational context and ensure the quality of care.

The development, updating and use of protocols for caring and administrative processes are a collective improvement and part of the quality program recommendations in the health service, because these actions organize, drive care and transform practice based on scientific evidence.¹⁸

Administrative technologies developed by nurses include new ways of conducting management, establishing indicators, differentiated strategies for integrating and ensuring individual and collective participation in the construction and re-construction of the processes involving nursing services, establishment of intra-and extra-hospital relationships and data networks. The style of managing people and services is shifting to a more humanized, open, flexible management, which values continuous learning.¹⁹

The nursing managers reported the use of participatory and corporative management and work organization models, by means of committees, action plans, assessment, aim and outcome indicator. The use of the participatory management model and the constant search to find ways for visibility to the development of the profession must be part of the advances in the nursing management. A study in Brazilian public institutions showed a positive correlation between a manager's participatory style and the high degree of employee autonomy in the improvement of the organizational climate and demonstrate that rigid and bureaucratic management models reduce innovation and process improvement.²⁰ A study in a city public hospital in Brazil, which evaluated the experience of participatory management, articulated to the care model that provided humanized and higher quality health care, expanded the participation of professionals in the management with greater interaction and autonomy, and contributed to the development of institutional democracy.²¹

In this context, one of the adopted models is quality management, considered important to guarantee excellence of caring, with emphasis on the management of the processes based on information, analysis, control and improvement, using indicators in systematic evaluations. The involvement of nursing professionals with the achievement of the outcomes established by means of indicators was demonstrated in the study, despite the fact that nurses had difficulties in using indicators.²² The

nurses managers of the UBS in a medium-sized municipality in the countryside of the State of Santa Catarina used health indicators and understand their importance as a tool for management, but few reported new proposals, in order to innovate and make indicators closer to their realities.²³

The relationship with suppliers and cost management were highlighted in the management practice. Suppliers are partners that positively influence in the innovation and organizational structure changes. In this partnership, the supplier participates in the development of the product design, improvement of the productive process of its customer, contributing to the quality of service. The maintenance of good and dedicated suppliers is a form of SC that can be measured and capitalized as resources of the organization to increase the just-in-time efforts, quality, and reinforce the speed needed to achieve the objectives.²⁴

The partnership and maintenance of good suppliers are more viable in a private hospital due to the direct business process between managers and suppliers, as well as the participation of nurses in this relationship. In the public sector, it is more difficult to maintain this relationship with suppliers, due to the fact that the purchase process occurs by auction and bidding processes, with the option of choosing the lowest price. However, nurses have increased their participation in bidding committees, advisory in purchasing sectors, issuing technical opinions in the processes of quality control, and selection of materials and equipment, mainly in public sectors.²⁵

By using strategies to reduce costs, managers use a number of innovative manners to implement changes that can reduce the cost of care, such as rework, irrational use of materials, waste, and so on. In several countries in the East, Asia, Europe, Africa and the Americas, and even in Brazil, health care costs have been increasing since the 1980s, as has the incorporation of new technologies, aging populations and waste being the main causes.²⁶

A study analyzed the evolution of the cost of hospitalization from 2008 to 2012 in Brazil, proving that the materials and medications are the items that increased the most, and the waste accounts for 20 to 30% of the increase in health costs in the United States.²⁷

Frequent meetings aiming at planning and socializing experiences and evaluating outcomes were reported by the managers. Meetings are used as a means of achieving change and support the quality of organizational processes when they are

well planned and positively coordinated. Organizational communication is an important management tool that integrates and coordinates the flow of information, enabling sharing and standardization of actions. Failures and barriers of communication cause a rupture in this process and compromise the quality of work.²⁸ In nursing management, a clear, fast and effective communication process using traditional methods such as information gathering or technology is important for sharing knowledge and the operational processes.

The informational communication system is implemented or in the process of being implemented in the service of some managers of public and private organizations, enabling virtual meetings and quick communication, taking advantage of the time of all professionals. On the other hand, the operationalization of the communication process, of any modality, needs to be planned and effective.

The managers recognized the importance of informatics in order to obtain fast and interconnected information in the care and management process. This statement is corroborated by a study that discusses the benefits to health team performance and the quality of care after the implementation of a computerized system, aimed at the management of indicators of nursing care in a Brazilian hospital.²⁹ Another aspect noted in the study conducted in 16 municipalities of the State of Bahia, concluded that the use of health information systems has not yet reached its full potential to aggregate production and knowledge sharing for decision making, although managers have sought to implement innovation in a incipient way, to improve information management practices, overcoming some obstacles.³⁰

The need for investment on material and financial resources is cited as an obstacle or difficulty, and can be overcome by the benefits of the work environment and the feeling of pride of the worker, and by the greater effectiveness in the process of communication and safety in the care process, all offered by the use of this technology.³¹

The databases are important in the monitoring and control of flows, occurrences and other data, which are indicators for planning and evaluation of the installed capacity of the service, according to the reports of the managers that already use them. The database is recommended in the management of the SC by facilitating the socialization of knowledge and acting as the basis for service assessment and decision making.⁵

The use of hard, soft-hard and soft technologies, which were evidenced in the managers reports, can present facilities and difficulties for the service, because it facilitates the caring process, enables qualification and safety of care, organizes information for decision making, streamlines the process of communication and sharing of knowledge, and improves the administration of nursing time, among others. Some of the difficulties are: lack of adaptation and professional unpreparedness to the new technologies; need for investment, not always available in the public service, for acquisition and for professional training; in addition to the dehumanization of care by distancing the patient.³²

Dehumanization of nursing care due to the use of hard technology, can be faced by using adequate use of soft technology, because it enables establishing interrelationships, in order to implement guidelines to reduce attitudes considered inhumane in the care process. In this sense, the integration of soft, soft-hard and hard technologies becomes essential for qualified care.

In addition to the facilities and difficulties stated by nurses regarding the use of technology, the existence of the growing cyclical relationship of dependence on advanced technological resources, the production of high-cost care to society and precariousness of work are notorious within health care. This circle is powered by underfinancing in the sector and by the privatization strategies of public services that permeate health policies in Brazil, strengthening private property and profit production. Such a scenario hinders the access and use of advanced technological resources, which does not guarantee the health and dignity of the citizen.¹⁶ However, the production of technology in the private business world is based on the capitalist perspective, seeking a differential element in the context of organizational competitiveness and essential to optimize productivity, accumulate assets and increase equity and profitability.

Given this political and organizational scenario, the managers report that nurses use and produce technologies, admittedly important in the daily work, innovating, applying and sharing knowledge to guarantee the quality of care and contribute to the professional and organizational development, whether in public, private or philanthropic hospitals.

The limitations in this study is related to the impossibility of generalizing the findings to the universe of hospital organizations, because they reflect

the lived experiences of the managers in particular organizational contexts.

CONCLUSION

Managers use the structural capital components in the management of operational processes: process/product improvement, technology, efficiency/effectiveness/management, communication/database process for the development of Care and Administrative Technology.

The development and use of these technologies occur in the routine of the nursing service, integrating the individual knowledge to the collective one to reach the improvement of quality, safety, efficiency, outcomes and cost reduction for nursing care and management.

Managers use the components of structural capital in management actions recommended for the development of the structural capital of organizations. However, investments and strategies are needed to improve these actions, by identifying the components that need to be optimized in their use and development, because an effective component requires a high level of alignment and integration with the others.

This study contributes to nursing management, as it explores new knowledge in the area, especially focusing on the development of technology, inherent in the daily work of nursing, which results in improved quality of care and professional and organizational growth and development. The results provide nurse managers with a better understanding of structural capital, with regard to organizing their use in the managerial practices.

REFERENCES

1. Stewart TA. A riqueza do conhecimento: o capital intelectual e a organização do século XXI. Rio de Janeiro: Campus; 2002.
2. Ciprian GG, Valentin R, Lucia VM, Mădălina GA. Elaboration of Accounting Financial Report on Structural Capital. *Procedia - Soc Behav Sci* [Internet]. 2012 Out [cited 2017 Aug 31]; 62(0):706-10. Available from: http://ac.els-cdn.com/S1877042812035604/1-s2.0-S1877042812035604-main.pdf?_tid=18f16c5a-7bb7-11e6-a342-00000aab0f6c&acdnat=1473993880_32339223333943cc7a08cb1a9203c53e
3. Gracioli C, Godoy LP, Lorenzetti DB, Godoy TP. Capital intelectual: uma ferramenta inovadora na busca por vantagens competitivas. *Rev Adm e Inovação* [Internet]. 2012 Out-Dez [cited 2017 Aug 31]; 9(4):96-120. Available from: <http://www.spell.org.br/documentos/ver/9322/capital-intelectual--uma-ferramenta-inovadora-na-busca-por-vantagens-competitivas>
4. Dewi K, Young M, Sundari R. Firm characteristics and intellectual capital disclosure on service companies listed in Indonesia stock exchange period 2008-2012. *J Account* [Internet]. 2014 Out [cited 2017 Aug 31]; 2(2):22-35. Available from: [http://www.meritresearchjournals.org/aaef/Content/2014/October/Dewi et al.pdf](http://www.meritresearchjournals.org/aaef/Content/2014/October/Dewi%20et%20al.pdf)
5. Aramburu N, Sáenz J, Blanco CE. Structural capital, innovation capability, and company performance in technology-based colombian firms. *Cuad Gest* [Internet]. 2015 Mar [cited 2017 Aug 31]; 15(1):39-60. Available from: <http://www.redalyc.org/pdf/2743/274339631002.pdf>
6. Gomez-Marquez J, Young A. A history of nurse making and stealth innovation [Internet]. Institute for Medical Engineering & Science. 2016 May [cited 2017 Aug 31]. Available from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2778663
7. Rocha PK, Prado ML, Wall ML, Carraro TE. Cuidado e tecnologia: aproximação através do modelo de cuidado. *Rev Bras Enf* [Internet]. 2008 Jan-Fev [cited 2017 Aug 31]; 61(1):113-6. Available from: <http://www.scielo.br/pdf/reben/v61n1/18.pdf>
8. Santos LA, Simões LS, Buck TD. Inovação como estratégia para o desenvolvimento. *J Innov Sustain* [Internet]. 2013 Set-Dez [cited 2017 Aug 31]; 4(3):3-28. Available from: <https://revistas.pucsp.br/index.php/risus/article/viewFile/17920/13310>
9. Bardin L. Análise de conteúdo. São Paulo: Edições 70 Brasil, 2011.
10. Lizarelli FL, Toledo JC. Identificação de relações entre melhoria contínua e inovação de produtos e processos por meio de revisão bibliográfica sistemática. *Gestão da Produção* [Internet]. 2015 Jul-Set [cited 2017 Aug 31]; 22(3):590-610. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-530X2015000300590&lang=pt
11. Santos MI, Silveira MF, Oliveira EA, Martelli DR, Dias VO, Veríssimo FM, et al. Evaluation of scientific production, patents and human resources training in the Brazilian nursing. *Rev Bras Enferm* [Internet]. 2015 Set-Out [cited 2017 Aug 31]; 68(5):564-72. Available from: http://www.scielo.br/pdf/reben/v68n5/en_0034-7167-reben-68-05-0846.pdf
12. Cipriano PF, Hamer S. Enabling the ordinary: more time to care. *Am Nurse Today* [Internet]. 2013 Nov [cited 2017 Aug 31]; 8(11):1-4. Available from: <https://www.americannursetoday.com/enabling-the-ordinary-more-time-to-care/>
13. Lorenzetti J, Trindade LL, Pires DE, Ramos FR. Technology, technological innovation and health: a necessary reflection. *Texto Context Enferm* [Internet]. 2012 Abr-Jun [cited 2017 Aug 31]; 21(2):432-9. Available from: <http://www.scielo.br/pdf/tce/v21n2/a23v21n2.pdf>

14. Santos FP, Nery AA, Matumoto S. Care provided to patients with hypertension and health technologies for treatment. *Rev Esc Enferm USP* [Internet]. 2013 [cited 2017 Aug 31]; 47(1):105-12. Available from: http://www.scielo.br/pdf/reeusp/v47n1/en_a14v47n1.pdf
15. Soratto J, Pires DE, Dornelles S, Lorenzetti J. Family health strategy: a technological innovation in health. *Texto Contexto Enferm* [Internet]. 2015 Abr-Jun [cited 2017 Set 1º]; 24(2):584-92. Available from: http://www.scielo.br/pdf/scielo.php?script=sci_arttext&pid=S1414-462X2016000300323
16. Romano CMC, Scatena JHG, Kehrig RT. Articulação público-privada na atenção ambulatorial de média e alta complexidade do SUS: atuação da Secretaria de Estado de Saúde de Mato Grosso. *Physis Rev Saúde Coletiva* [Internet]. 2014 Out-Dez [cited 2017 Aug 31]; 25(4):1095-115. Available from: <http://www.scielo.br/pdf/physis/v25n4/0103-7331-physis-25-04-01095.pdf>
17. Velho JM, Treviso P. Implantação de programa de qualidade e acreditação: contribuições para a segurança do paciente e do trabalhador. *RAS* [Internet]. 2013 Jul-Set [cited 2017 Aug 31]; 15(60):90-4. Available from: <http://bases.bireme.br/cgi-bin/wxislind.exe/iah/online/?IsisScript=iah/iah.xis&src=google&base=LILACS&lang=p&nextAction=lnk&exprSearch=728199&indexSearch=ID>
18. Alves KY, Salvador PT, Tourinho FS, Santos VE. Análise do Conceito “Protocolos de Enfermagem” a partir da evolucionária de Rodgers. *Rev Enferm UFPE* [Internet]. 2014 Jan [cited 2017 Aug 31]; 8(1):177-82. Available from: <https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/9622/9608>
19. Trevizan MA, Mendes IA, Ventura CA, Jabur MR, Tognoli SH. Ressocialização do enfermeiro gerente. *Rev Enferm Ref* [Internet]. 2011 Jul [cited 2017 Aug 31]; 3(4):161-6. Available from: <http://www.redalyc.org/pdf/3882/388239963017.pdf>
20. Biazzini MR, Muscat AR, Biazzini JL. Modelo de aperfeiçoamento de processos em instituições públicas de ensino superior. *Gest Prod* [Internet]. 2011 [cited 2017 Aug 31]; 18(4):869-80. Available from: http://www.scielo.br/scielo.php?pid=S0104-530X2011000400013&script=sci_abstract&tlng=pt
21. Deus AD, Melo EM. Avaliação de uma experiência de gestão hospitalar participativa no âmbito do SUS: produção de saúde, sujeitos e coletivos. *Saúde Debate* [Internet]. 2015 Jul-Set [cited 2017 Aug 31]; 39(106):601-15. Available from: <http://www.scielo.br/pdf/sdeb/v39n106/0103-1104-sdeb-39-106-00601.pdf>
22. Menezes PI, D’Innocenzo M. Dificuldades vivenciadas pelo enfermeiro na utilização de indicadores de processos. *Rev Bras Enferm* [Internet]. 2013 Jul-Ago [cited 2017 Aug 31]; 66(4):571-7. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-71672013000400016&lang=pt
23. Paes LG, Bellato TM, Machado BP, Lima SB. O uso de indicadores como ferramenta de gestão na estratégia saúde da família. *Rev Enferm UFSM* [Internet]. 2015 Jan-Mar [cited 2017 Aug 31]; 5(1):40-9. Available from: <http://cascavel.ufsm.br/revistas/ojs-2.2.2/index.php/reufsm/article/view/14150>
24. Vaz CR, Inomata DO, Viegas CV, Selig PM, Varvakis G. Capital intelectual: classificação, formas de mensuração e questionamento sobre usos futuros. *Rev Gestão e Tecnol* [Internet]. 2015 Abr-Jun [cited 2017 Aug 31]; 5(2):73-92. Available from: <http://navus.sc.senac.br/index.php/navus/article/view/253>
25. Garcia SD, Haddad MCL, Dellaroza MSG, Costa DB, Miranda JM. Gestão de material médico-hospitalar e o processo de trabalho em um hospital público. *Rev Bras Enferm* [Internet]. 2012 Mar-Abr [cited 2017 Aug 31]; 65(2):339-46. Available from: <http://www.producao.usp.br/bitstream/handle/BDPI/38199/S0034-71672012000200021.pdf?sequence=1>
26. Lara N, Leite F. Variação dos custos médicos hospitalares e inflação geral - Por que esses índices não são comparáveis no Brasil e no mundo? [Internet]. Instituto de Estudos de Saúde Suplementar. Textos de Discussão, nº 52; 2014 [cited 2017 Aug 31]. Available from: <http://documents.scribd.com/s3.amazonaws.com/docs/i1vssp0jk3utd74.pdf>
27. Reis A, Mansini G. Fontes de desperdício de recursos no sistema de saúde americano [Internet]. Instituto de Estudos de Saúde Suplementar; 2013 [cited 2017 Aug 31]. Available from: <https://www.editoraroncarati.com.br/v2/phocadownload/derperdicio.pdf>
28. Manzo BF, Brito MJM, Alves M. Influência da comunicação no processo de acreditação hospitalar. *Rev Bras Enferm* [Internet]. 2013 Jan-Fev [cited 2017 Aug 31]; 66(1):46-51. Available from: <http://www.scielo.br/pdf/reben/v66n1/v66n1a07.pdf>
29. Labbadia LL, D’Innocenzo M, Fogliano RR, Silva GE, Queiroz RM, Carmagnani MI, et al. Sistema informatizado para gerenciamento de indicadores da assistência de enfermagem do Hospital São Paulo. *Rev Esc Enferm USP* [Internet]. 2011 [cited 2017 Aug 31]; 45(4):1013-7. Available from: <http://www.scielo.br/pdf/reeusp/v45n4/v45n4a32.pdf>
30. Pinheiro AL, Andrade KT, Silva DO, Zacharias FC, Gomide MF, Pinto IC. Gestão da Saúde: o uso dos sistemas de informação e o compartilhamento de conhecimento para tomada de decisão. *Texto Contexto Enferm* [Internet]. 2016 [cited 2017 Aug 31]; 25(3):1-9. Available from: http://www.scielo.br/pdf/tce/v25n3/pt_0104-0707-tce-25-03-3440015.pdf
31. Matsuda LM, Higarashi IH, Évora YD, Bernardes A. Percepção de enfermeiros sobre o uso do computador no trabalho. *Rev Bras Enferm* [Internet]. 2014 Nov-Dez [cited 2017 Aug 31]; 67(6):949-56. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S003471672014000600949&lng=pt&nrm=iso&tlng=en

32. Salvador PT, Oliveira RK, Costa TD, Santos VE, Tourinho FS. Tecnologia e inovação para o cuidado em enfermagem. Rev Enferm UERJ [Internet] 2012 Jan-

Mar [cited 2017 Aug 31]; 20(1):111-7. Available from: <http://www.facenf.uerj.br/v20n1/v20n1a19.pdf>

Correspondence: Ana Lúcia Arcanjo Oliveira Cordeiro
Escola de enfermagem - UFBA
Rua Augusto Viana s/n
40110-909 -Salvador, BA, Brazil
E-mail: anaarcanjo@hotmail.com

Received: December 14, 2016
Approved: September 06, 2017

This is an Open Access article distributed under the terms of the Creative Commons (CC BY).