

Technology in intensive care and its effects on nurses' actions*

TECNOLOGIA NA TERAPIA INTENSIVA E SUAS INFLUÊNCIAS NAS AÇÕES DO ENFERMEIRO

TECNOLOGÍA EN LA TERAPIA INTENSIVA Y SUS INFLUENCIAS EN LAS ACCIONES DEL ENFERMERO

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ABSTRACT

The objective of this study was to identify the social representations that nurses have about technology applied to intensive care, and relate them to their ways of acting while caring for patients. This qualitative study was performed using social representations as the theoretical-methodological framework. Interviews were performed with 24 nurses, in addition to systematic analysis and thematic content analysis. The results were organized into three categories about the lack of technological knowledge, approach strategies, mastering that knowledge and using it. The knowledge necessary to handle the technology, and the time of experience using that technology guide the nurses' social representations implying on their care attitudes. In conclusion, the staffing policy for an intensive care setting should consider the nurses' experiences and specialized education.

DESCRIPTORS

Cuidados de enfermagem
Unidades de Terapia Intensiva
Tecnologia
Desenvolvimento tecnológico

RESUMO

Objetivou-se identificar as representações sociais de enfermeiros sobre a tecnologia aplicada em cuidados intensivos, e relacioná-las aos seus modos de agir no cuidado do paciente. Pesquisa qualitativa, cujo referencial teórico-metodológico foi o das representações sociais. Realizou-se entrevistas com 24 enfermeiros, observação sistemática e análise de conteúdo temática. Os resultados se organizaram em três categorias sobre o desconhecimento da linguagem tecnológica, estratégias de aproximação, seu domínio e sua aplicação. O saber/conhecimento necessário para o manuseio da tecnologia, e o tempo de experiência do seu manejo orientam as representações sociais dos enfermeiros, incidindo nas suas ações de cuidado. Conclui-se que a política de contratação de pessoal para trabalhar em cenário de terapia intensiva deve considerar as experiências e a formação especializada dos enfermeiros.

DESCRITORES

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RESUMEN

Se objetivó identificar las representaciones sociales de enfermeros sobre la tecnología aplicada en cuidados intensivos y relacionarlas a sus modos de actuar en el cuidado del paciente. Investigación cualitativa, con referencial teórico-metodológico de Representaciones Sociales. Se realizaron entrevistas con 24 enfermeros, observación sistemática y análisis de contenido temático. Los resultados se organizaron en tres categorías sobre el desconocimiento del lenguaje tecnológico, estrategias de aproximación, dominio y aplicación. El conocimiento, necesario para la utilización de la tecnología y la experiencia en su manejo orientan las representaciones sociales de los enfermeros, incidiendo en sus acciones de cuidado. Se concluye en que la política de contratación de personal para trabajar en escenario de terapia intensiva debe considerar las experiencias y formación especializada del enfermero.

DESCRIPTORES

Atención de enfermería
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INTRODUCTION

Nursing allocation across hospital sectors does not always take into account the professionals' experiences, preferences or specialty. Nurses who have been working in a sector for a long time have no guarantees that they will continue working in the same sector⁽¹⁾. Consequently, they work in field in which they have no client experience, or do not master the tools needed for patient care, and are therefore considered novice nursing.

Novice nurses are characterized by limited and inflexible behavior. That is so because, due to the fact that they are inexperienced, steps are taken for them to continue performing their activities, with a view to serving as a kind of facilitating guide in the development of their actions. These same steps, however, can act against their performance, as the rules do not set the most adequate decisions in view of a real situation⁽²⁾.

Novice nurses' actions are restricted when considering the technological complexity inherent in intensive care. In this context, to maintain life and recover health, patients are linked to devices that momentarily perform their vital functions. Thus, besides direct patient care, theoretical and practical knowledge about machine handling is fundamental to understand its functioning and interpret the data, which guarantees the reliability of results and the directions of care⁽³⁾.

Nurses who are experienced in client care using technological devices tend to exhibit a safer practice, in which technology is used as an instrument that provides support for care delivery. Novice nurses, with more limited actions, face difficulties to solidly articulate technology use with client care. In view of the above, the research problem is summarized in the following question: does the insertion of nurses without experience in technological environments, articulated with the technology management time, influence their care actions for clients at these sectors?

Due to their inexperience in care practice, novices can neglect certain actions for clients using technological devices⁽⁴⁾. Another aspect that deserves to be highlighted is the creation of bonds of dependence from experienced nurses to perform specific tasks and solve daily problems related to care technology use, mainly in emergency situations that require immediate nursing actions.

Technology changes the way of life and determines influences in different social, economic and environmental fields, affecting lifestyles and exerting cultural and social control on the human being⁽⁵⁾. Significant changes have occurred in nursing work, mainly in intensive care, affecting hospital care infrastructure. Because of the incorporation of technologies in nursing care, feelings like fear and

anguish emerge, as well as ambivalent conducts of proximity or distancing from clients.

Health technology is a complex phenomenon that arouses reflections and daily conversations on the different client care experiences that depend on it. In that sense, in the light of the concepts that sustain a socio-constructionist conception of technology, the latter constitutes a psycho-sociological knowledge object, influencing specific ways of action in nursing care⁽⁶⁾. Therefore, this research is justified because understanding how nurses construct the idea about technology and getting to know the elements that interfere in this construction will provide support to understand how it acts towards the client, permitting the implementation of future strategies with a view to care quality. Identifying nurses' social representations about technology applied in intensive care, and relating them with their ways of acting in client care.

METHOD

In this descriptive and qualitative study, the process-based social representations theory (SRT) was applied. Social Representations (SR) are a form of practical knowledge, establishing the links between subjects' thoughts and actions, helping them to orient themselves in the world⁽⁷⁾. The objects of social representations are socially relevant and part of social subjects' daily conversations. Technology, mainly in the intensive care universe, matters for nurses, mainly for those professionals who deal with it in their practices. An imaginary exists about the technologies used in intensive care. They are considered complex and are admired and feared. These

Technologies are an object of social representation because they are relevant and gain social contours⁽⁸⁾ for the group of nurses, justifying the application of social representations theory in the approach of this object.

The scenario was the Cardio-Intensive Unit of a large federal hospital in Rio de Janeiro. This unit comprised 30 nurses, which represented the research universe. The inclusion criteria were: being a nurse working at the study sector during the research period; delivering care in any shift, attending clients in the immediate post-operative period after heart surgery; accepting to participate in the research. The sample consisted of 24 nurses, as four were on holiday or leave and 2 refused to participate. The subjects were classified in two groups: novices – who had worked in highly technological sectors for up to two years; and veterans – who had worked in highly technological sectors for more than two years.

Individual interviews were held, using a semistructured question script, and 40 hours of systematic observation of these nurses' practice. The observation data were registered in a field diary and dense description was ap-

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plied for their analysis, implying the subject and researcher's interpretation of the observed data⁽⁹⁾. Thematic content analysis techniques were applied to the interviews⁽¹⁰⁾. The data corpus was broken up in recording units, based on the occurrence of themes, in line with major trends in their appearance. The recurrence of the analysis was accomplished by linked the recording units with the context units, in the final outline of the empirical categories, which joined around the technological language and its mastery, evidencing learning strategies to deal with the technology.

The subjects were identified through alphanumerical codes: Nu: nurse; No: novice; V: veteran; F: female; M: male; N: night shift; D: day shift; and the number corresponding to the interview sequence.

Approval for the research project was obtained from the Institutional Review Board at the *Hospital dos Servidores do Estado*-RJ, protocol No 000.298 and all participants signed the Informed Consent Term. Data were collected between December 2007 and March 2008.

RESULTS AND DISCUSSION

The novice nurse and the unknown being: technological language

The encounter with the new and unknown marked 21 out of 24 testimonies, coming from novices and veterans. When one is a novice, technology emerges as an unknown, new, strange being, as nurses start to deal with two novelties: technology itself and work in an unknown environment, attending clients with whom they have no experience, and in which subjects and machines are seen as a single thing, as technology is incorporated in the client.

At first it was difficult, I had recently graduated, I hadn't had contact with technology, we experience some difficulty. Working in intensive care is very new and you're not experienced. Sometimes people do not explain right how it works (NuNoFN14).

At the start of my career, I worked at a pediatric ICU, I got desperate because I didn't know how to work, I came from the medical clinic. Standing in front of a new device, not knowing and being obliged to handle it, because if not it can (pause) it's that patient's life that can go away (NuVFD7).

The unknown being has its own language, with specific handling codes that need to be deciphered with a view to their adequate use. Its sounds and colors need to be interpreted because technology has a peculiar way of communicating and, to deal with it, nurses need to understand its language in order to apply it in client care.

When you first look, you see that there's a patient there, totally surrendered to different machines and you don't know

how to operate them and interpret the signs it's sending you. At first it's difficult and challenging to understand what the respirator is trying to tell you (NuNoFD10).

Technology reveals to be unknown and makes it impossible to deliver appropriate care if the familiarization process does not occur. Therefore, it is paramount to get to know its language. To take care of technology-dependent clients, besides the essential fundamentals of care, nurses need knowledge about the clients' specificity, which in this case involves handling technology and interpreting its information, so as to direct care. Nurses need to understand and master the *technological language* so as to translate it with a view to client care. Technology amplifies the signs the client's body issues and their non-understanding contributes for nurses to take distance from the clients.

You have to link what technology offers through its use. You have to master the technology. After you learn how to master it, that technology no longer scares you (NuNoFN14).

I think it was the need to learn in order to be able to master. Master (pause). Like, if something happens I know how to interact (NuVFN17).

The recording units reaffirm the existence of this technological language and nurses' need to master it. Mastering technologies is a synonym of greater valuation in the job market and permits greater insertion in the professional area.

When you are looking for a job at a private institution, the curriculum is very important. Intensive care experience gives you a plus over nurses working at open units. You won't be as highly considered as a person working at an ICU. In the people's view, technology highlights you in professional terms, even in nursing (NuNoFD15).

Concerning novice nurses, as they do not know the *technological language*, they lack mastery and security to take care of clients linked to technological devices. This situation interdicts care for this type of clients.

At first, I even stopped myself from getting to the bedside, out of fear of touching the client and disconnecting something and of not knowing what and how to do it. I cried several times (laughs) and faced it. I had a pocket book, but nothing worked because practice you gain in daily reality. I see these newly graduated nurses, the fear of getting close to the bedside, of washing the patient, applying dressings (NuVFN12).

For novice nurses, technology constitutes an obstacle that prevents them from performing their main function, which is client care. The representation about technology is gradually constructed as if it were an adversary or enemy. In the formation process of social representations about technology, nurses use images that see the existence of this conception of technology as something exotic, which needs to be deciphered, made known and, then, turned into an ally. An element of anchorage is observed

when the novice approaches the figure of a child who is discovering things.

It should be highlighted that this is not about personalizing technology, as it is considered that it does not exist in itself, but depends on the human being's presence with a view to its adequate incorporation into care. As its use comprises a universe of knowledge, however, structured to reach certain care objectives, if the subject handling the technology does not possess this knowledge, this prevents him/her from reaching the objectives. Consequently, technology is seen as an obstacle/barrier, an exotic/unknown being, in some situations an enemy to be defeated.

A UFO is arriving. Then everyone says: "Ohhhh, what's that?" I'm in that phase. The technological apparatus appeared in front of me, I'm watching, opening the door to get in and get to know it. I look for the information to get to know and master and be friends with that ET [extra-terrestrial], the ET movie (laughs). That thing fell, everyone kept on watching, so the person's afraid, anxious. Then he becomes friends and sees that it's human, it's good. He's kind, sweet and anyone can use it. Even children, provided that they are trained. The child would be that person who just got there, newly graduated or not, it's his first contact (NuNoFN21).

Do you know what came to me, it's crazy, but I thought of a jungle, because like, at first, the person who is starting feels like in a jungle, filled with animals, apparatus, lions, zebras, giraffes, all that, a real jungle filled with animals looking at you, almost attacking you. They create an image and, through practice, they see that it's not that complicated (NuVFD5).

When relating knowledge with experience, it is understood that nursing experience will entail expertise, intellectual and scientific authority, which can be understood as the association between theoretical knowledge and practice and which, in turn, distinguishes nurses⁽²⁾. Due to the complexity of care delivery in intensive therapy and the presence of increasingly advanced technological resources, nurses need greater attention in their technical and scientific performance. Experience guides nurses' way of care, so that care quality is related with their experience and feeling, that is, their impressions gained based on professional experience⁽¹¹⁾.

The insertion of inexperienced nurses in a specialized area represents the transition from a known to an unknown social world, marked by concerns and changes. In this modification phase, novices feel unprepared to deal with specific situations, leading to a discrepancy between what they know and do on the one hand and what they should know and do on the other⁽¹²⁾. The novelty produces experiences marked by extreme feelings and values, attitudes and behaviors, thoughts and practices, which range from a positive to a negative tone, including anger and revolt⁽¹²⁾. The impact of meeting the new can encourage nurses to experience the change or make them give up.

It is acknowledged that the subjects interpret the situations or objects they are confronted with in daily life differently. Thus, they do not behave in the same way towards a phenomenon that remains identical, i.e. they get organized according to their representations⁽⁷⁾.

In this sense, novice nurses construct social representations about technology differently from veterans. The novices associate technology with an obstacle to the performance of their profession. Because of the lack of or little knowledge, they do not manage to approach the client to practice what they should be prepared to do: care. This obstacle is objectified in the comparisons between technology and something that is weird, unknown and hardly common to them, using metaphors like something very difficult, monsters, UFO, extraterrestrial beings. Almost like enemies to be overcome, so as to permit care in the presence of technology.

The social representation constitutes an act of thinking through which a subject relates with an object. It means re-presenting, making present to the spirit, to conscience, an act of thinking that symbolically restores something absent, which re-approximates something distant. One of the processes that contribute to the elaboration of this representation is objectivation. Objectifying means using images to grant concreteness to abstract notions, grant material texture to ideas, give body to conceptual schemes⁽⁷⁾. By associating the image of technologies used with clients with *exotic beings*, the nurses re-establish the understanding that, in a struggle between two adversaries, one needs to conquer the enemy with the weapons available. In this case, the weapon refers to knowledge apprehension – about the machine and nursing – which allows them to master the technology and approach clients with a view to care delivery.

Based on these elements, the representations constructed about technology make the novices understand it as a non-ally; hence, they do not manage to use technology to their benefit in client care, because they do not understand its language. In addition to this knowledge lack/deficit, there is the possibility that this technology will become its enemy (non-ally), which can cause harm to the clients who depend on it, due to its bad or inadequate use, without offering the expected benefits.

When asked about whether technology entailed some harm, 09 interviewees (3 novices and 6 veterans) highlighted that harm only happens when nurses do not know how to handle the technology. According to one third of the interviewees, technology itself does not cause harm, which occurs when it depends on correct use by the user.

When professionals are unable to handle the device, he can cause harm, he does not know it or uses it inadvertently, if that client does not need a certain device, then you are using it without knowing, it's not the time to use that, it can cause some harm (NuVFD6).

Data from the field observation show that not mastering technological knowledge can entail direct implications to maintain the client's life as, in one of the scenes registered, a client using a multi-parameter monitor revealed a blood pressure level of 180 x 90 mmHg, and an electrocardiographic wave compatible with heart arrhythmia. The client demonstrated signs of anguish, tension and anxiety. The nurse enters the box, observes the infusion bomb treatment, stands away from the bed and does not identify anything.

Not having the knowledge to deal with technology means not mastering its language and finding the language weird. The weird is the unknown, what we do not recognize, which sometimes frightens, terrifies or is insignificant to us, like the report from the field observation for example. Fear is justified due to not knowing how to handle or solve situations that happen with the client, compromising his clinical condition and therapeutic evolution. This experience of fear based on lack of knowledge occurred 09 times in the novices and 11 in the veterans' testimonies.

At first, if you don't know how to deal with that, you're scared, the unknown scares you. Fear does exist because you don't know how to handle it, something unknown in your life (NuVFD7).

What causes fear is not knowing how to deal with the technology, a problem occurs and you don't know how to act. The person prefers to stay with another patient for whom, theoretically, she known what to do. (NuNoFD15).

Insecurity is a natural feeling nurses experience when they are confronted with a new situation they need to face. This insecurity is also something that can help them in the decision process, as it obliges them to think about the pros, contras and consequences of their choices. Insecurity is due to different causes, the main one of which is related to psychological pressure, i.e. to the fact of doing something about which one does not know or does not have sufficient knowledge yet to support one's actions⁽¹²⁾.

Unveiling the unknown beings: from technological literacy to mastery

To master the technological language and deliver comprehensive care to technology-dependent clients, novices need to learn all manipulation codes and technology's communication modes. They need to go through a *technological literacy* process, which involves the adoption of a range of strategies, so as to overcome the obstacles technology imposes. One of the means refers to knowledge acquisition, which demands availability.

You need to be willing to get to know technology, know how to operate it. It's no use to act in a sector like this if you don't know how to use the technology to your benefit (NuNoFD1).

In view of this need to learn about technology, to enable care delivery to dependent clients, two groups of

nurses exist: those who want and those who do not want to master it. Among those who do, the literacy process starts by coping with fear, in addition to the adoption of strategies to get to know the apparatus in order to master it.

Over time, I lost my fear and decided to actually face it, at the bedside, I really rolled up my sleeves and started to work. I gradually faced the fear, disconnecting and connecting the monitor, respirator alarm sounding, calling people: *Teach me: why is the alarm sounding?* (NuVFN12).

When nurses are sensitized to a problem identified in their daily work, they get motivated to learn and transform. This motivation emerges from practices and is related with the professionals' identity⁽¹³⁾. It is admitted, though, that nurses can also experience feelings like denial, which starts to interfere to the extent that, in view of a novelty that needs to be learned, they adopt a behavior of disbelief, without demonstrating interest in *making a move* when confronted with the innovative reality⁽¹²⁾.

To apprehend knowledge, they adopt formal strategies: new learning through training and recycling courses; and informal ones: linking up with more experienced nurses in the mastery of available technological resources, a strategy identified in 15 subjects' statements, including novices and veterans; and approximation with the machinery.

Based on the practical experiences and knowledge accumulated during experienced nurses' professional life, novices apprehend elements that will support their actions in the future, and will provide support to take care of clients using technologies.

Whenever I'm in doubt, I ask someone for help. The nurses who worked with me, older, more experienced, they helped me (NuVFD5).

I tried to link up with people whom I saw were more familiar with the machine, the people who understood the machine, I asked them to explain me and, if I had any momentary doubt, if I didn't know what it was I called the person to explain (NuNoFD10).

The veteran nurses serve as a kind of translators of the machines' language, which needs to be unveiled, guiding the novices in client care, until they get literate and apt to take charge of nursing care.

Today, I'm experienced and help people who aren't, new ones are arriving, they don't know it, because it's complicated when you are facing a severe patient and you don't know (NuVFD5).

One informal strategy 06 interviewed nurses adopted refers to greater contact with the machine in the attempt to unveil it, know its meanings, reveal its nuances and particularities to be used to the client's benefit, as an ally in care. Nurses tamper with the machine and observe it, looking for its manipulation codes, usage modes, meanings of its component elements and functioning details.

To learn and understand, when the machine is out of use, without a patient, connect it, tamper with it, really understand, know what it is I am using to facilitate my care delivery (NuNoFD1).

I attempt, dealing with the equipment, solve my doubts during unfilled moment. Not just watching colleagues, but me looking at the equipment more closely (NuVFD2).

The learning strategies people use depend on the duration of their experience in a given task or function. When they are novices, or upon their first contact with a new situation, nurses seek to learn through models, trying to find elements that guarantee the reproduction of service routines⁽¹³⁾. Due to the fact that they are inexperienced, novice nurses attempt to learn through reproduction. Thus, in an initial phase, they attempt to get to know the service rules, standards and routines so as, then, based on experience over time, to be able to question certain situations experienced⁽²⁾.

To decrease their insecurity, novices act in a guided way, through routines that systemize the procedures or through an experienced nurse. These mechanisms help them to learn in a smoother and less traumatic way⁽¹²⁾.

Among the formal strategies, the testimonies revealed 11 occurrences related to the search for scientific information about client care in a wide range of clinical and surgical conditions, and about technology as care equipment. This search happens through recycling, updating and specialization courses, congresses and books.

I study and research on the Internet, the equipment manual is something I discovered. It helps a lot to take the manual and see how the machine works. There's one person who managed to read three cardiology books in one week. Some people make efforts to study on their own, one is already looking for a graduate program (NuNoFD15).

Readings on specific daily situations are aimed at broadening theoretical knowledge on the themes, so as to better direct the professional care actions, and are part of the set of formal strategies to deal with the unknown, in the attempt to overcome common sense about technology, integrating them into the reified universe (of science).

Nurses who invest in technological literacy go through a change process, which involves thoughts and practices. By learning on the devices used in care, novices change the conditions in which discourse is produced and, consequently, their forms of acting, characterizing the knowledge transition process, which ranges from the consensual to the reified universe. The obtained information influences the objectivation processes, as the normative decontextualization, figurative nucleus establishment and naturalization phases depart from another reference point and, consequently, find other support grounds⁽⁷⁾.

Among those nurses unwilling to master the technology, it is observed that they maintain their behavior of distancing from the client. When technology handling is nec-

essary, these nurses withdraw from the frontline of care. Acting like that, they do not advance in the knowledge construction process, nor naturalize or master technology.

There are people who, when you elaborate the scale, attempt to avoid patients who are more technology-dependent, they face difficulties, fear and prefer to recede (NuNoFD15).

Some try to gain knowledge, adequate experience and evolve across the shifts. Others seem to be uninterested, do not adapt and attempt to take distance from these patients. They seek patients who depend less on technology (NuVMD19).

Some nurses do not take distance from the client, but get accommodated, without seeking the knowledge needed to take care of the client and deliver care without scientific background, which increases the possibilities of risks for the client.

Others continue in the same situation, doing just for the sake of doing it. People get dumb, do that for the rest of their lives, neither know why nor if what they do is correct (NuVFN17).

This is a delicate issue and, when talking about this theme, about the choice not to master the technology, they do not assume this behavior for themselves, but talk with regard to the others. Among the factors justifying this type of choice, the fact that nurses are working in another sector than they prefer is highlighted. As they are in an environment they do not identify with, they do not feel stimulated to get to know the novelties that appear in daily work. Another aspect is the sector professionals' welcoming of novices. It is conjectured that bad welcoming is an obstacle for novices to dedicate themselves to learning about technology and to approach clients who are using it.

Finally, liking the type of care delivery, clients and technology appears as a determinant factor to drive nurses positively in view of the challenging situations of daily care. The naturalization process occurs when nurses go through technological literacy and reach mastery. Who does not invest in this process continues understanding technology as a stranger and is unable to deal with it.

It can happen that people see a monitor their entire life, you ask them to change something and they are unable to. They live with technology but do not know how to deal with it (NuVFD3).

Mastery: the technological look

Nurses who went through the literacy phases and reached the mastery of technological language are accredited for adequate technology handling and manage to take care of the clients. They reached a level at which technology ceases to be an enemy that arouses unwanted feelings and turns into an ally that can be used to the benefit of clients and professionals.

It can provoke fear when you don't master it, it's something unknown, but when it is revealed, understood, assimilated, it ceases to be, to cause fear and ends up being an ally (NuVMN13).

But it changed as follows: I learned to deal with it, I learned to lose the fear I had of working with technology. So, what changed in me was the following: losing the fear and taking better care of the patient who needs to be attended with technology (NuNoFN14).

When nurses reach the stage of mastery, technological novelties no longer represent unknown beings as, no matter the extent to which machines are renewed, they manage to anchor the new in what they are already familiar with, that is, in previous experiences of contact with technology.

Various times equipment arrives which I don't know how to operate. That's not going to explode in your hand, you can find out, move beyond and turn that to your benefit, an ally (NuNoFD11).

This recording unit exemplifies one of the elaboration processes of social representation – anchorage -, through which the meaning of the representation is attributed, equipping knowledge and permitting rooting in a system of thinking. Anchorage enhances a network of meanings that grants coherence, establishing anticipated thinking on the object based on social values. The subject elaborates memory, in which the thought under construction rests on already established thoughts, organizing the new in existing pictures, in what is already known⁽⁷⁾.

When nurses gain the theoretical-practical knowledge that enables them to take care of clients using technology, they feel safer with these resources, which grants them tranquility and comfort in client care. The security the wide range of technologies in the care environment provides is justified as, when they manage to master them, they are able to apply them to the patient's benefit.

By mastering the technologies, the nurses are able to consolidate their clinical assessment through a second look, similar to that of an advanced sentry, which would be the technological look. This broadens the capacity of their senses when they deliver care to critical patients, making them feel safer and confident in decision-making. The tranquility and security nurses who master technology experience are clearly cited in 05 subjects' testimonies.

It makes you feel calmer because you're not just seeing with your eye. You have data from technology itself, which is showing you. It makes you feel more at ease to deal with the patient, when you know how to operate all that. If you don't, you're going to feel insecure (NuNoFN23).

I feel safe about these technologies because I know that they grant me further security, a better parameter to observe the patient's hemodynamics, to be sure about what is happening, I feel very secure about having this type of device with me (NuNoFD10).

Using technology in the diagnostic-therapeutic process offers precision, speed and security⁽¹⁴⁾ and its mastery benefits clients when nurses diagnose hemodynamic alterations, interprets the devices' information, intervenes readily in a problem, follows its clinical evolution and re-directs care. These benefits were mentioned in 13 interviewees' testimonies.

Technology influences the precision of the patient's signs and symptoms, rapid detection of situations, the diagnosis tends to be precise, treatment immediate and adequate (NuVMD19).

In the field observation, it was detected that, when nurses master the technology and use it correctly, it helps them identify the clients' clinical alterations, liberating them to accomplish other tasks inherent in care or making them feel more relaxed. Technology broadens the capacity of the nurse's senses to identify possible alterations in the clients' clinical conditions, and is thus understood as a means that permits nursing care.

It was also observed that technology reduces time and effort when accomplishing tasks and care, enhancing the nurses' efficiency, because it facilitates their work, to the extent that it speeds up, offers greater precision and speed in actions, granting further time for the nursing team to dedicate itself to care, improving care quality⁽¹¹⁾.

The social representations of nurses who reached the mastery of technology or who had already reached this level reveal the perspective that it serves as an ally in care, objectified through the use of the image of an eye, which would be the technological look. Mastery permits translating the machine's look in such a way that, based on their knowledge and interpretations, it conducts nursing care delivery to clients, integrated with the multiprofessional team. By naturalizing technology and applying it in care, nurses perform their responsibilities more autonomously. They are accountable for their actions and decisions, making the work process flow in cooperation with and adding value to the team. The research results showed that the learning gained through the technological literacy process changes the nurses' position in the care space. With greater autonomy, they operate their work object – care – securely at the interface with technology.

CONCLUSION

Social representations about technology emerge based on specialized knowledge needed for its handling, with the time of experience in technology handling serving as a reference. Specialized (technological + care), resulting from professional experience, appears as a fundamental element to understand the way nurses are going to construct their thoughts about technology. That is so because novices elaborate their thinking about technology seeing it as an *enemy/stranger, something very difficult*, as a threat to nurses. Consequently, they act in a dependent way and interdict cli-

ent care. Veteran nurses, on the other hand, represent technology as an ally, a *look/sentry*, as something favorable and, therefore, they act independently, using technology in their actions.

For some time, novice nurses go through the unveiling of technological language. When they reach the mastery of this language, they get familiar with the weird. Until reaching mastery and using technology as a complementary care tool, however, they experience their own and characteristic ways of coping and adopt strategies to deal with the difficulties. Also, depending on the way these phases develop, these novice nurses' actions can influence client care.

The nurses' social representations about technology influence care and direct – novice and veteran – nurses' particular forms/ways of acting. Hence, nurses' social representations about technologies orient the fact that they approach or take distance from care delivery to clients using these. These particular forms of nursing actions display opposite characteristics: distancing/approach, fear/security, harm/benefits, unknown/familiarity. These elements affect the quality of client care, entailing positive and negative repercussions, mainly in terms of risks and benefits.

The impacts of care delivered by a non-qualified professional include the neglecting/underuse of technology use

in care. Similarly, its unfounded use can entail irreversible damage for the client's health, as they are in conditions in which their vital functions are susceptible to rapid changes.

Thus, this research is relevant to the extent that it shows the importance of using criteria in nursing hiring/admission policies, in view of the particularities of the care context and clients. In terms of practical application, this research reveals the constituent elements of novice nurses' ways of acting, providing support for interventions, with a view to minimizing the impacts of this professional's insertion when admitted to an institution, through the adoption of strategies that makes them assume a transformative, critical-reflexive position towards technology-dependent client care. Hence, managers are responsible for guaranteeing that nurses have the knowledge and skills required for care delivery to critically ill clients.

The relevance of professional experience and specialized qualification is ratified, which should be re-signified in the current nursing hiring context, mainly in the public sphere. Undergraduate nursing courses increasingly need to get involved in a professional education process that respond to the job market's needs, mainly with regard to technological applications in care and their adequate mastering.

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