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Original Article

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EXPERIENCE OF NURSES IN THE MANAGEMENT OF CONTINUOUS HEMODIALYSIS AND ITS INFLUENCES ON PATIENT SAFETY

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ABSTRACT

Objective: to analyze the professional experience of intensive care nurses and its influence on their work activities in the continuous hemodialysis process and patient safety in the intensive care unit within the scope of the collaborative model.
Method: qualitative and exploratory research, based on the systemic paradigm of patient safety, developed at the Intensive Care Unit of a private institution in the city of Rio de Janeiro, Brazil. There were 23 nurse participants who had been working for more than three months in study scenery and in direct contact with continuous hemodialysis. The data were produced from June to October of 2016 by means of observation, analyzed using thick description as well as semi-structured interviews, and then submitted to the content analysis technique.
Results: were organized in two categories: the first one portrays the influence of the professional working experience on the safety of nurses' performance, which verified that in relation to continuous hemodialysis, inexperienced nurses follow guidelines and manuals, without a complete evaluation of this care situation and face difficulties in the performance of everyday care. The second category demonstrates the impact of the nurse´s inexperience on the occurrence of active errors, evidencing actions that result in the occurrence of adverse events.
Conclusion: the insertion of inexperienced nurses is a latent condition in the investigated system that results in the occurrence of incidents in the continuous hemodialysis process, requiring the improvement of the collaborative model through the systematic monitoring of the performance of these professionals, such as the proposal of a safety barrier.

DESCRIPTORS: Nursing. Hemodialysis. Intensive care units. Patient safety. Professional practice.

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EXPERIÊNCIA DE ENFERMEIROS NO MANEJO DA HEMODIÁLISE CONTÍNUA E SUAS INFLUÊNCIAS NA SEGURANÇA DO PACIENTE

RESUMO

Objetivo: analisar a influência da experiência profissional dos enfermeiros intensivistas no manejo da hemodiálise contínua, na segurança de sua atuação no âmbito do modelo colaborativo frente ao paciente que dela se utiliza na unidade de terapia intensiva.
Método: pesquisa qualitativa e de cunho exploratório, pautada no paradigma sistêmico da segurança do paciente, desenvolvida na unidade de terapia intensiva de uma instituição privada do município do Rio de Janeiro, RJ, Brasil. Participaram 23 enfermeiros que atuavam há mais de três meses na no cenário do estudo, no manejo direto da hemodiálise contínua. Os dados foram produzidos de junho a outubro de 2016 por meio de observação, analisados a partir da sua descrição densa, e de entrevistas semiestruturadas, submetidos à técnica de análise de conteúdo.
Resultados: foram organizados em duas categorias: a primeira retrata a influência da experiência profissional na segurança da atuação do enfermeiro, em que se verifica que os enfermeiros inexperientes agem no manejo da hemodiálise contínua seguindo diretrizes e manuais, sem uma avaliação completa desta situação de cuidado e enfrentando dificuldades no cotidiano da assistência. A segunda categoria demonstra o impacto dessa inexperiência do enfermeiro na ocorrência de erros ativos, evidenciando-se ações que resultam na ocorrência de eventos adversos.
Conclusão: a inserção de enfermeiros inexperientes é uma condição latente no sistema investigado que converge para a ocorrência de incidentes no manejo da hemodiálise contínua, requerendo o aprimoramento do modelo colaborativo através do acompanhamento sistemático do desempenho destes profissionais, como proposta de barreira de segurança.

DESCRITORES: Enfermagem. Hemodiálise. Unidades de terapia intensiva. Segurança do paciente. Prática profissional.

EXPERIENCIA DE ENFERMEROS EN EL MANEJO DE LA HEMODIÁLISIÓN CONTINUA Y SUS INFLUENCIAS EN LA SEGURIDAD DEL PACIENTE

RESUMEN

Objetivo: analizar la influencia de la experiencia profesional de los enfermeros intensivos en el manejo de la hemodiálisis continua, en la seguridad de su actuación, en el marco del modelo colaborativo frente al paciente que de ella se utiliza en la unidad de terapia intensiva.
Método: investigación cualitativa y de cuño exploratorio, pautada en el paradigma sistémico de la seguridad del paciente, desarrollada en la unidad de terapia intensiva de una institución privada del municipio de Río de Janeiro, Brasil. Participaron 23 enfermeros que actuaban hace más de tres meses en el escenario del estudio, en el manejo directo de la hemodiálisis continua. Los datos fueron producidos de junio a octubre de 2016 por medio de observación, analizados a partir de su descripción densa, y de entrevistas semiestructuradas, sometidos a la técnica de análisis de contenido.
Resultados: fueron organizados en dos categorías: la primera retrata la influencia de la experiencia profesional en la seguridad de la actuación del enfermero, en que se verifica que los enfermeros inexpertos actúan en el manejo de la hemodiálisis continua siguiendo directrices y manuales, sin una evaluación completa de esta situación de cuidado y enfrentando dificultades en el cotidiano de la asistencia. La segunda categoría demuestra el impacto de esta inexperiencia del enfermero en la ocurrencia de errores activos, evidenciando acciones que resultan en la ocurrencia de eventos adversos.
Conclusión: la inserción de enfermeros inexpertos es una condición latente en el sistema investigado que converge para la ocurrencia de incidentes en el manejo de la hemodiálisis continua, requiriendo el perfeccionamiento del modelo colaborativo a través del acompañamiento sistemático del desempeño de estos profesionales, como propuesta de barrera de seguridad.

DESCRIPTORES: Enfermería. Hemodiálisis. Unidades de terapia intensiva. Seguridad del paciente. Práctica profesional.

INTRODUCTION

The focus of this article is the nurse's role in the continuous hemodialysis process in the Intensive Care Unit (ICU) regarding patient safety. The interest in this topic is based on the empirical observations of the researcher from her professional experience with continuous hemodialysis and patient care in the ICU under the collaborative model, in which it was realized that, as inexperienced, the domain and translation of the technological language by the ICU nurse were not effective, in some circumstances, for the resolution of practical situations related to the management of continuous hemodialysis, and could impact on patient safety.

Therefore, the production of knowledge on this subject was analyzed in order to problematize such observations. This analysis reveals that the studies are organized in two major perspectives: the first is related to the evaluation of the use of continuous hemodialysis, including: cost-effectiveness; impact on patient mortality; its effectiveness in relation to intermittent methods; modalities of continuous hemodialysis.[1–4]

The second perspective, which is linked to the interest of this article, dealt with the organization of patient care in continuous hemodialysis in the ICU. To this extent, the nurses' performance is highlighted, whose discussion is based on: the need for specialized knowledge and training in order to conduct continuous hemodialysis; the nursing care: with the patient, the machine and the hemodialysis circuit, and focus on the prevention of complications; and the use of clinical protocols.[5–8]

These researches highlight that there is doubt regarding which model to adopt in relation to the professional responsible for the management of continuous hemodialysis in the ICU, if conducted exclusively by the nephrologist nurse, the intensive care nurse, or a shared / collaborative model with the participation of both. In this context, one of the routes of the investigation problematizes the preparation of the intensive care nurse for the management of continuous hemodialysis, without there being a consensus on this practice.[5,7–8]

In addition, a large part of the publications dealing with this topic were theoretical, describing the modalities of hemodialysis and nursing care in this process,[4,9] with few field investigations, especially national, focused on the practice of nurses in the continuous hemodialysis process in relation to patient safety.

The collaborative model includes the participation of the nephrologist nurse and the ICU nurse, providing an exchange of knowledge. In this model, ICU nurse is responsible for ordering the materials that will be used in such a procedure, the assembly, installation and maintenance of the continuous hemodialysis equipment, analysis of the necessary laboratory tests for the alteration of the clinical parameters pre-established by the nephrologist, as well as the interpretation of the information generated by the equipment and the identification and intervention of any problems with its operation. The nephrologist nurse is responsible for managing this process and providing problem solving assistance.[9–10]

When establishing the counterpoint of the results of the knowledge production analysis with the researcher´s preliminary observations on the insertion of the intensive care nurse under this collaborative model, the need for investigations that discuss such insertion is strengthened, particularly the nexus regarding the professional experience of the nurses with continuous hemodialysis and patient safety.

This is because, experience in the nursing profession generates expertise, which is the association between the theoretical knowledge and practice that distinguishes the nurses' performance.[11] Thus, the professional´s level of experience in relation to patient care is a condition which may result in the nurse committing errors in their work activities.

This concern, with the influence of experience in the management of continuous hemodialysis technology, is aligned with the National Policy on Health Technology Management, particularly regarding

the evaluation of technologies in the operational domain, which analyzes the variables that affect the performance of technology and of the user.[12] In this sense, this policy considers that experience with technology is a human characteristic that interferes with its usability, and therefore deserves to be the focus of investigations that provide information on the risks of the use of the equipment related to this characteristic.

The objective of this study was to analyze the professional experience of intensive care nurses and its influence on their work activities with continuous hemodialysis and patient safety in the intensive care unit within the scope of the collaborative model.

METHOD

A qualitative exploratory research, whose theoretical support is that of the systemic paradigm of patient safety. This is based on the understanding that the occurrence of adverse events is linked to inadequacies in the delivery of healthcare. It can be seen as the system having vulnerabilities similar to the holes found in Swiss cheese, which can line up and cause the adverse event. The multiple factors (several holes) would be the source of the problem, which are related to the problems in practice, products, processes.[13–14]

Therefore, errors made by health professionals - active errors, expected in this system, are not causes, but consequences of characteristics referring to structure and process, which become evident only when events occur - latent errors, such as: work, poor communication, insufficient training, etc.[13–14]

One of the conditions conveyed by studies that influence performance and can impact safety is experience.[15–16] Therefore, professional inexperience can be considered as a latent error, which justifies the choice of such a reference for the analysis of the influences of experience on safety in relation to the management of continuous hemodialysis in the ICU, with the aim of developing defense barriers for this system.

The research was performed in the ICU of a private institution in the city of Rio de Janeiro (Brazil) that performs continuous hemodialysis organized by the nurse in the collaborative model for critically ill patients with renal disorders. This ICU has 26 beds, which are divided into three subunits, assisted by the same multidisciplinary team and coordinated by a nurse manager. On average, 76 continuous hemodialysis sessions using the PrismaFlex equipment occur per month, approximately two a day.

The following professionals participate in the collaborative model of continuous hemodialysis in this ICU; the ICU nurses responsible for conducting the hemodialysis process, from assembly to removal; specialist dialysis nurses, who have theoretical and practical experience in conducting hemodialysis, and are responsible for managing the process in this unit and for clarifying doubts and problem solving. These nurses also perform other patient care activities. The medical team also participates, which is responsible for the indication of continuous hemodialysis and the prescription of the clinical parameters.

The research participants were the nurses working at the aforementioned ICU, selected based on the following criteria: working directly in the management of continuous hemodialysis and working for more than three months in the unit, as nurses working in the unit for less than three months are under the supervision of another nurse and are in the training phase. Managers, those responsible for the management of continuous hemodialysis, and those absent during the research period due to vacation leave, were excluded from the study.

The possible total number of nurses working in the three subunits was 49, who took turns on a 12-hour shift with a 60-hour rest period. In order to gather these potential participants, the researcher was inserted into the field for an exploratory adaptation period in order to become familiarized with

the participants and to provide explanations regarding the research. Taking the proposed goal into consideration, participants from different work shifts and level of experience were sought.

The first phase of data production was observation, with the intention of acquiring the generic characteristics regarding the practice of handling continuous hemodialysis, in order to be able to fully develop them during the interviews, serving as a support for the analysis of its content and making the counterpoint between the discourse and practice possible.

Therefore, it was not sought to evaluate the practice of each individual nurse, but to understand the daily routine of care during the management of hemodialysis based on the performance of a group of nurses present in the sector on the days when hemodialysis session occurred, and to understand the professional care actions and deepen the process of analysis.

In this observation, the principles of ethnographic observation[17] were used for the theoretical training of the researcher, so that she could approach and distance herself from the phenomenon, in order to avoid biases of interpretation based on the previous judgments due to her experience regarding the management of hemodialysis in the study area. In this first phase of the observation, to ensure quality, the records were brought to the discussion with another researcher with experience in the application of this technique.

The records were recorded in a field diary, using an observation script that enabled the description of the nurses' work during the installation, operation and post-use of continuous hemodialysis. 130 hours of observation were recorded, which included records of their statements, the course of actions, place and moment of the situations, in written or narrative form. Data were collected from June to October of 2016.

The second phase of data production was the interviews which were performed in order to understand the interpretation of the respondents regarding the phenomenon. Thus, all those who were observed were also interviewed. The interviews were semi-structured, conducted in the research sector, using a digital device, according to participants' availability, with an average duration of 20 to 30 minutes. The script was built based on data from the observation phase and in the supporting literature,[5,8–9] addressing: performance, difficulties / problems faced, training / qualification, area of work, safety incidents.

The analysis of the observation data was performed based on this thick description of the scenes of the care actions in the management of continuous hemodialysis, allowing for the researcher´s interpretation. Content analysis was used for the interview data.[18] The following systematics were performed: after the floating reading phase to obtain impressions on the analysis corpus, spreadsheets were used to verify the themes, based on the marking in this corpus of thematic registration units (RU) and their quantification.

Once they were identified, RUs were grouped into themes based on their meaning and then recorded separately in a spreadsheet with a code, title, RU number and the interviews in which they were identified. The mapped themes were analyzed in relation to their manifest and latent content, with the inferences made in the light of the referential[13–14] applied in the research. These themes were approached taking into account their meaning, the purpose of the research and their numerical relevance, which generated the organization of the categories, recorded in a second spreadsheet with the RU number regarding the themes and their percentage.

This systematic allowed us to evaluate the addition of new elements in relation to existing ones and their sufficiency regarding the objectives. Thus, the criterion of theoretical saturation[19] was used to decide on the increase of the number of participants or conclusion of data production, in order to ensure the internal validity of the research.

During the mapping of the themes in relation to the interviews a repetition in the 18th interview was detected, thus five more were performed to obtain a balance of the participants in relation to the

professional characteristics. The production of the data was finalized with a total of 23 participants, as the density needed to meet the objectives was verified.

The participants gave their permission by signing the Informed Consent Form and were identified by the code C=nurse, followed by the Arabic number in sequential order according to the order of the interview.

RESULTS

The personal and professional profile of the investigated individuals is characterized by: 82% women, aged between 30-40 years (43%); 65% of the participants are not ICU specialists; 39% have up to five years of work experience after graduation and 38% have 5-10 years; 56% have worked in the area for five years.

Professional experience: latent errors and impacts on the nurse's performance

The data show that experience distinguishes nurses in their work, which is a theme addressed in 49 URs. The experience of the ICU nurses in contact with this type of user leads to the acquisition of practical knowledge that leads them in the daily situations related to the operational management of the continuous hemodialysis technology. Likewise, the inexperienced professionals performing such management may influence the safety of this practice, as indicated by experienced nurses C1 and C19.

> [...] *Perhaps for a little more immaturity, to take the initiative in what is done in this intercurrence with the patient, is very limited to a prescription: 'Potassium caused a decrease, what do I do? Do I make a quick replacement or replace it in the bag? Is there a bleed, the pressure is increasing, do I wash or not?' This still happens, but they will only have that maturity with time, there is no way, from one day to the other say: 'Wash the catheter! But wait, I can wash, how much do I wash?* [...]*' This handling of how to wash, like this, like that, is still a little intimidating for the new ones, they need a second person to help* (C1 - more than ten years of work experience; more than ten years in the sector; not an ICU specialist).

> *I think the coagulation of the filter, sometimes when we have better know-how, we can realize that the filter is going to coagulate, some people don't check for this problem, so sometimes if it alarms the first time try to wash soon to see how the filter pressure will stay* (C19 - more than ten years of work experience; more than ten years in the sector, not an ICU specialist).

It can be seen in the statements of nurses C1 and C19, with more than ten years of work experience in the sector, that the experience or know-how supports the recognition of the demands and the accomplishment of the interventions. The practical experience then generates the recognition of the nurses' expertise to act in the management of hemodialysis technology, adding value to their qualification and making those who have it a reference for the newer nurses in overcoming the difficulties inherent to this phase, as observed among the nurses who have worked for up to five years in the sector and are not specialists.

> *I think the nurses' qualification is great. In relation to my colleagues, I think it is very good. I hope to know what they know one day, because they know a lot, most of them have worked here for a long time, so they are already used to the Prisma, so I think it's great* (C7 - up to five years of work experience, up to five years in the sector; not an ICU specialist).

> *My colleagues, on the other hand, have worked here for a long time and are also better at using the Prisma and are able to fix that problem* (C11 - up to five years of work experience. up to five years in the sector; not an ICU specialist).

The performance of experienced nurses is depicted on the day which C7 was assisting a patient on continuous hemodialysis. At 8:45 am the equipment sounds the warning alarm for the weight in the pre-blood pump (wbp). C7 goes to the bed, observes the alarm and presses the control on the equipment to silence the alarm. Then observes the connections, moves the dialysis solution bags and presses the continue button. A short time later the equipment started to alarm again. He then leaves the bed and asks for another nurse, who went to bed, analyzed the scales and identified that he had the highest hooks. After adjusting them, he says: "*It can only be that because we have already verified everything and everything is correct!"*

> *The machine indicated correct functioning. C7 says to the nurse who helped her: I tried to fix it, I looked at everything, but I could not identify what she was saying, because it was nothing to do with the WBP, so I did not know what to do* (excerpt from C7, observed between 8-12 hours).

The insertion of an inexperienced nurse in the management of continuous hemodialysis technology leads to contact with the new, which causes fear and insecurity. These feelings originate from the responsibility of the nurse to conduct this therapy, the knowledge necessary for its performance, the critical condition of the patient and the risk of incidents that could cause harm to the patient.

> *Regarding the colleagues who come and are new to the sector, we realize that they have more difficulties, especially with the alarms, because of fear, insecurity, the alarms scares them a lot, I think the main thing that I realize, that when the alarm rings there is a frenzy, they are frightened by the alarm and the responsibility of staying with the patient using the Prisma, but then I realize that they can solve the problem and call colleagues who have more practice when they are unable* (C23 - more than ten years of work experience more than 10 years in the sector, not an ICU specialist).

> *Difficulties at the beginning of the use of Prisma, because I had no contact, nor technical knowledge regarding this therapy. It was very difficult, everything was very new, expectations were huge, a mixture of insecurity and fear* (C17 - from 5-10 years of work experience, up to five years in the sector, not an ICU specialist).

Therefore, inexperienced nurses experience a challenging period with difficulties that limit their performance in relation to the demands of patient care and continuous hemodialysis, as is the case of the previous experiences narrated by C7 and C3.

> *I had never heard of Prisma, and not very much about continuous dialysis, It was not mentioned during my undergraduate course so when I had to use it, my experience was traumatizing, especially because the patient was very unstable, I was training at the time and the patient's tracheostomy cuff burst and which had be reinserted surgically, then we had to return the blood fast, we had to return everything, so it was kind of chaotic, all in the same day, so I was learning, after that everything went more smoothly* (C7 - up to five years of work experience, up to five years in the sector, not an ICU specialist).

> *I think* [...] *at first, for me it was not just to set up, because setting up was ok, the problem was when I started the dialysis, to have that notion that ultrafiltration is associated with norepinephrine, dormonid also interferes in a certain way, sedatives also interfere with hemodialysis, the potassium result, I do not always have to follow it exactly because I also have to see the other things that are being infused. When do I have to deal with calcium chloride? When do I have to put the bicarbonate, when the citrate is finished?* [...] *Things that I did not know before and*

not everybody is willing to tell you, or give you this information, I learned over time (C3 - 05 years of work experience, up to five years in the sector, not an ICU specialist).

These statements demonstrate that the nature of the way these difficulties present themselves reveals the need to reflect on the way in which the insertion of these inexperienced nurses occurs, since they can have an important impact on patient safety.

Inexperience and active errors: impacts on patient safety

The repercussions of inexperience are evidenced by the types of problems in the management of continuous hemodialysis that bring great discomfort to these nurses, exemplified in excerpts such as calibration of the scales, the blood return phase, the assembly of the hemodialysis equipment or issues with the alarms.

[...] *When closing the scales, the professional may fail to close the scale properly which could change the scales. This happens a lot when the professional does not have much experience* (C10 - more than ten years in the sector, more than ten years of work experience, not an ICU specialist).

My greatest difficulty was to return the blood, because it is something that we do not do every day, so I had to let the the blood return from the Prisma to be able to take a look to see how this dynamics works (C11- up to five years of work experience; five years in the sector, not an ICU specialist).

The alarms [...]*, I had difficulties in identifying the alarms, when it rang I did not know what it was, I did not have that feeling of let's check everything and now I already have that change* (C3 - up to five years of work experience; up to five years in the sector, ICU specialist).

This statement exemplifies the difficulty of the inexperienced nurse in returning the blood to the patient. This occurred due to the expiration of the filter, which implied the need to interrupt the treatment and set up another system. At 15:30 on this observation day the hemodialysis equipment belonging to bed 142 starts to alarm because the filter had expired.

The preparation for the replacement of the system used for the continuous hemodialysis of this patient is then started. C4, responsible for the care of this patient who has less than two years of work experience in the sector, seeks help to return the blood to the patient. He addresses the researcher: *I have set up the continuous hemodialysis several times with no problems, but I have only returned the blood once or twice and I am still not completely sure about how to do it.*

Then, nurse 19, who has 13 years of work experience in the sector, goes to this bed and explains the procedure to C4. After separating the material, C4 connects a tap to the arterial line, washes the system to the patient's line and closes it; then turns the tap in the opposite direction to the patient's line, returning the blood.

The process occurred without any intercurrence, and during her development C4 stopped, looked at what she was doing, and repeated: *That's the way she said it, isn't it?* [turning to the researcher and referring to what the nurse had explained about how to proceed, trying not to make a mistake in the step-by-step process]. *At 16:20 hours the blood return procedure ends and the preparation is begun for the installation of a new line to the patient*. (field diary excerpt for C4 and C19, from 8-12 hours).

Difficulties regarding returning the blood to the patient, as well as interpreting the alarms which were mentioned by the interviewees, have repercussions on safety when they cause active errors that cause incidents such as treatment interruption and patient blood loss, as indicated by the participants.

Often the machine alarms and you can't fix it, the system coagulates and the patient ends up losing the blood, because I could not make it return. (C18 - up to five years in the sector; up to five years of work experience; not an ICU specialist).

Being able to silence the alarms is a matter of lack of knowledge and even to interrupt it, in the presence of an alarm, to go and press a key without first reading or observing what it is signaling or the problem that it detected, sometimes due to anxiety or insecurity. The question of wanting to do it correctly and then it goes wrong and you lose the filter, which is not cheap and you have to stop the treatment because the machine unloads everything and you have to restart the treatment and you lose more than an hour as well as the patient's blood, because you are not always able to return the blood. This is very stressful (C20 - more than ten years in the sector, more than ten years of work experience, not an ICU specialist).

One of the factors that influences the non-return of blood present in the continuous hemodialysis circuit to the patient is related to the nurse's actions and their inexperience, as evidenced by these statements.

A nurse with little experience with the method, the problem that he was unable to return the blood when the machine alarmed due to coagulation of the system, so this led to the loss of this unnecessary blood volume (C21 - between 5-10 years in the sector, between 5 to 10 years of work experience in the sector; ICU specialist).

I have already seen that they cannot return the blood because they did not identify the problem before, at the right time, before the discontinuation of the treatment (C8 - between 5-10 years of work experience, up to five years in the sector, ICU specialist).

The loss of blood due to the impossibility of returning the volume present in the circuit to the patient, is an adverse event, and deserves attention in this system.

DISCUSSION

The data showed evidence that the experience of the ICU nurse is a differential due to their performance in relation to the patient who requires such specific care, however, inexperienced professionals are also included in this care, since a little more than half of the participants investigated had a maximum of five years in the sector. The empirical data allows one to reflect on how this insertion occurs, considering the characteristics of the new nurse and the type of care that is provided in continuous hemodialysis.

The presence of inexperienced nurses is also seen in other realities.[15,20] A study on the profile of nurses working in an ICU presented the qualification characteristics of these professionals in order to discuss their implications in the intensive care provided to users. This profile is marked by the large number of nurses with less than three years of ICU experience, which expresses the low theoretical and practical experience in this highly complex care area.[20]

The role of experience in the performance of professionals is ratified in research on the sources of knowledge used in daily practice by ICU intensive care nurses in Norway. In the units of meaning, the following sources were identified: research, theoretical knowledge, experiential knowledge, workplace culture, clinical experience and patient participation. Regarding the experience, the study showed that the contact that nurses establish with other professionals of the unit itself and other sectors in their daily care allow them to exchange knowledge and information that are relevant to their daily work practices.[21]

When thinking about the characteristics of the beginner phase, a novice is someone who has no experience in performing a practice, but this term is not homogeneous, as this person may be new

to one domain and experienced in another. This difference is based mainly on the mobilized mental model, since there is an operational rigidity and little anticipation of the variation of the situations in the novices, because they access knowledge more slowly and their reasoning has a low level of abstraction. Thus, they follow formal rules and procedures without taking into account particularities that could indicate the need for adjustments.[22]

Research done with new, experienced and supervising nurses on the experiences of new nurses reveals an inability to apply knowledge learned in practice, through deficiencies in the communicative and managerial basis of care.[23]

The specialist nurse, on the other hand, presents great experience -background. On the basis of the practical situations experienced, the experienced nurse intuitively establishes the diagnoses and performs actions, avoiding previously unsuccessful proposals and behaviors previously tested.[11] These characteristics and skills that differentiate the expert from the beginner were the question of the research with 49 nurses, to understand what characterizes an expert nurse. The results showed: broad vision, ability to anticipate, perspicacity, speedy action, definition of priorities with competence. Therefore, they have a deeper knowledge due to their experience in the nursing clinic.[24]

By understanding the characteristics of inexperienced nurses and the phases through which they passes until they reach proficiency, it is possible to discuss their insertion in the management of continuous hemodialysis. One of the characteristics of the research that deals with this topic is insecurity. This lack of confidence was present in an international study that investigated the perception of the experienced nurse regarding the newly graduate nurse working in an emergency or ICU department.[25]

The experienced nurses felt that the newly graduate nurses lack confidence due to inexperience, fear and inability to think critically. In addition, the difficulty in setting priorities and managing time increased this lack of confidence that, along with feelings of panic or fear can paralyze the new graduate. The lack of receptivity to the new graduate is also a factor that diminishes this confidence, especially when they perceive contempt for their work, ignorance or refusal to answer a question.[25]

Such lack of receptivity was evidenced in the experience of ten new nurses in an ICU. The research of this experience reveals a lack of support and guidance by the multiprofessional team, with rare positive feedback, an aspect that could have influenced the confidence necessary for nursing practice and positively influenced the performance of the new nurse in the ICU.[26]

In this study, some recent graduate nurses thought that their inexperience in the ICU had repercussions on the level of confidence that the patient could have of their ability to perform nursing care. Thus, they tried to hide their experience time and even their age and appearance from their patients and their patients family members.[26]

By establishing links between the empirical data and the studies on the subject it is verified that reflection is needed regarding the characteristics of the beginner and their practice in continuous hemodialysis. The first aspect of this reflection is related to the academic formation, since the data indicates a lack of information on this subject in the undergraduate degree course, illustrated in the statements when the nurse says: “never had heard or had contact”.

Therefore, in addition to the gaps in their intensive care training, the professional must learn to use the complex continuous hemodialysis equipment. This causes feelings of insecurity, fear and lack of confidence portrayed in the testimonies and also present in the C4 observation record, which does not feel prepared to return the blood to the patient and change the hemodialysis circuit.

To overcome this phase the nurse reproduces what others do or what others tell them to do, as one of the interviewees says: “what he does in this situation, is very limited to a prescription.” Thus, they rely on rules, norms and guidelines, failing to perceive the situation as a whole in order to make clinical judgments (referred to by a deponent as “lack of feeling”). As a result, they can not predict certain situations, such as the coagulation of the filter referred to by one of the experienced nurses,

or ask questions such as “when should I put calcium chloride?”, and relying on the experienced nurses for “know how”. This support is expressed during observation by C7’s request for help, who was unable to interpret the meaning of the alarm.

When considering the systemic paradigm of patient safety for the analysis of the occurrence of errors and adverse health events, it originates from the perspective that addresses them as a moral issue, as well as from the responsibility of the individual as the only cause. Instead, the focus is on understanding why the system’s defenses have failed in order to make it a resilient system. In this understanding, the differentiation of the active and latent error adopted in such a model is justified, because it seeks to prevent the error by changing the conditions of the individual´s work. Thus, unlike the active error, latent errors can be identified earlier.[13–14]

These refer to the decisions made by analysts and managers responsible for the design and operation of the system, which may bring about an error in the work environment (inadequate equipment, fatigue, professional inexperience) or weaknesses in the system (untrustworthy alarms, inefficient work processes). The combination of an active error with latent conditions is responsible for accidents.[13–14]

This is seen in the research in the way the inexperienced nurse is inserted (latent failure), which is reflected in the difficulties faced by them in the handling of alarms and generates the silencing behavior without its resolution (active error), resulting in loss of patient blood volume (adverse event). C20 is an example, when they highlight the effect of insecurity and non-understanding of the technological language on the silencing behavior of alarms, complemented by the C21´s report that points out the patient´s loss of blood volume due to difficulties arising from inexperience.

The interface of the presented evidences interpreted in the light of the systemic paradigm of patient safety shows that the level of experience is therefore a latent condition in the investigated system that converges to the occurrence of incidents in the management of continuous hemodialysis applied to the critical patient in the ICU. This evidence about the influence of experience on patient safety is corroborated by other research,[27–28] such as the organizational factors that contributed to adverse events in an adult ICU in the period 2008-2013. A total of 638 adverse events were identified with 498 patients, which had a seasonal increase. The number of nurses per bed and the arrival of inexperienced physicians were associated with the rate of adverse events, showing that organizational factors are more related to adverse events than the severity of the disease.[27]

When comparing the types of incidents in continuous hemodialysis detected in the research with those present in other investigations, similarities are observed. In the reports of 25 professionals of the nursing team of the dialysis unit in a teaching hospital 517 adverse events were detected, of which the coagulation of the extracorporeal system also appears as the most frequent with a total of 25 occurrences. The causes of the adverse events were related: to the patient, being in 18 of them due to their clinical condition; to the professional, in 172 cases for individual errors, besides the lack of preparation; and to the organization of the service, in 105 for inadequate material resources and equipment, in addition to work overload, lack of training, water supply, etc.[29]

In a study that estimated and analyzed the prevalence of adverse events related to hemodialysis, the documental analysis of 117 medical records found the occurrence of 1,272 adverse events in 94 medical records, which is equivalent to a prevalence of 80%. The frequency of adverse events was: inadequate blood flow (40%), bleeding from venous access (11%), infection (9%), system coagulation (7%), equipment failure (5%). Concerning the damages, 76% were mild, 22% moderate and 0.9% severe.[30]

In the systemic paradigm of patient safety, the incidents identified come from holes in the defense layer of the system. Regarding the detection of this fragility and its understanding, it is sought to strengthen these defense systems by creating barriers and proposing actions to the individual,

team, task, place of work and organization. Since the nursing team provides direct care to the patient it is at the forefront of this system, with the risk of reaching it quickly if errors occur, we must consider the defensive strategies for the safety of nursing care to the patient in order to avoid recurrence of these accidents, as in the case of this study.

Taking into account the above, considering the gaps in the academic training regarding the nurse´s work activities with continuous hemodialysis, since this is still not a common practice in many institutions, as well as the difficulties experienced by the new nurses, the periodic training program of the institution's nurses needs to be addressed, so as to go beyond the use of the technology and its functions, and prepare the nurses for realistic simulations of everyday situations, especially those identified in the research, in order for them to develop necessary skills such as clinical reasoning and decision making.

In addition, it is important that the collaborative model adopted in the sector develops systematic strategies that will enable the dialysis nurses to accompany the new nurses more closely. In this understanding, it is recommended that a monitoring program directed at the continuous hemodialysis process which includes experienced nurses and beginners, aimed at identifying the difficulties, stimulating clinical reasoning in a learning-friendly environment which provides support for feelings of inexperience and which helps to resolve the daily problems of hemodialysis management.

There are limitations related to the number of continuous hemodialysis sessions that occurred during the study period, which reduced the scope of the observation phase.

CONCLUSION

In view of the objective outlined, it is concluded that the level of experience influences the safety of nurses' actions in the management of continuous hemodialysis. The results show that the inexperienced nurses are not capable of completing an evaluation of this care situation, and act based on guidelines and manuals and face difficulties in daily care.

These difficulties result in active errors that, in some moments, materialize in the occurrence of adverse events to the patients, particularly the loss of blood volume due to inability of return of the blood that was present in the circuit of continuous hemodialysis. Therefore, in the light of the applied theoretical framework, the results indicate that the level of experience of the nurse in the management of continuous hemodialysis is a latent condition capable of generating active errors and compromising patient safety.

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NOTES

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CONTRIBUTION OF AUTHORITY

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CONFLICT OF INTERESTS

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