

## HEMOTRANSFUSION UNDER THE PERSPECTIVE OF NURSING CARE

A hemotransusão sob a perspectiva do cuidado de enfermagem

La hemotransfusión bajo la perspectiva del cuidado de enfermería

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### How to quote this article:

Santos LX, Santana CCAP, Oliveira ASB. Hemotransfusion under the perspective of nursing care. Rev Fund Care Online. 2021 jan/dez; 13:65-71. DOI: <http://dx.doi.org/10.9789/2175-5361.rpcfo.v13.7458>

### ABSTRACT

**Objective:** this paper assesses the nurses' performance throughout transfusion therapy. **Methods:** it is a descriptive-exploratory research with both qualitative and quantitative approaches, which was performed with 31 members of the nursing team in a highly complex oncology unit at a public teaching hospital. Data collection took place from September to December 2017 by using semi-structured interviews and a checklist for observation. The data were organized in a spreadsheet for calculating simple frequencies and absolute values. After this, data were submitted to thematic analysis. **Results:** most professionals reported not being able to provide transfusion care, lacked information on proper care and monitored the patients ineffectively. Furthermore, they did not meet biosecurity standards. **Conclusion:** it is highlighted the importance of continuous training and implementation of instruments that can ensure safe transfusion care.

**Descriptors:** Blood transfusion; Nursing care; Transfusion reaction; Biosecurity; Patient safety.

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## RESUMO

**Objetivo:** verificar a atuação da equipe de enfermagem durante a assistência em terapêutica transfusional. **Método:** pesquisa descritiva e exploratória, com abordagem quanti-qualitativa. Participaram do estudo 31 membros da equipe de enfermagem lotados em um hospital público e de ensino, habilitado como unidade de alta complexidade em oncologia. Os dados foram coletados entre setembro e dezembro de 2017 em duas etapas: por intermédio de entrevistas semiestruturadas e de um *checklist* para observação. Os dados foram agrupados, dispostos em tabelas e apresentados em frequência simples e valores absolutos e avaliados por análise temática.

**Resultados:** a maioria dos profissionais referiu não se sentir apta a prestar a assistência transfusional. Observou-se não conformidade em aplicar normas de biossegurança, uma ineficaz monitoração do paciente e ausência do registro de informações sobre a assistência prestada. **Conclusão:** destaca-se a importância da capacitação contínua dos profissionais e a implementação de instrumentos que possam assegurar a assistência transfusional segura.

**Descritores:** Transfusão de sangue; Assistência de enfermagem; Reação transfusional; Biossegurança; Segurança do paciente.

## RESUMEN

**Objetivo:** verificar la actuación del equipo de enfermería durante la asistencia en terapéutica transfusional. **Método:** investigación descriptiva y exploratoria, con abordaje cuantitativo. Participaron del estudio treinta y un miembros del equipo de enfermería abarrotados en un hospital público y de enseñanza, habilitado como unidad de alta complejidad en oncología. Los datos fueron recolectados entre septiembre y diciembre de 2017 en dos etapas: por intermedio de entrevistas semiestructuradas y de un *check list* para observación. Los datos fueron agrupados, dispuestos en tablas y presentados en frecuencia simple y valores absolutos y también evaluados por análisis temático. **Resultados:** la mayoría de los profesionales mencionaron no sentirse aptos para prestar la asistencia transfusional. Se observó no conformidad en aplicar normas de bioseguridad, un ineficaz monitoreo del paciente y ausencia del registro de informaciones sobre la asistencia prestada. **Conclusión:** se destaca la importancia de la capacitación continua de los profesionales y la implementación de instrumentos que puedan asegurar la asistencia transfusional segura.

**Descriptores:** Transfusión sanguínea; Asistencia de enfermería; Reacción a la transfusión; Bioseguridad; Seguridad del paciente.

## INTRODUCTION

After the discovery and classification of the first human blood groups into A, B and O (called the ABO system) by Karl Landsteiner at the beginning of the 20th century, there was the impetus for the practice of blood transfusion and its consequent progress worldwide.<sup>1</sup>

Blood transfusions have been recognized as an important strategy for carrying out different clinical treatments and are used for administering blood components via intravenous route.<sup>2</sup>

Therapeutics include risks and, therefore, transfusions must occur in safe environments in the presence of qualified professionals who ensure the quality of the procedure, adequate monitoring and prompt care for dealing with intercurrents resulting from transfusion reactions.<sup>3</sup>

It is the nursing staff's role to ensure transfusion safety by recognizing the types of blood components, their indications, and contraindications, check data in order to prevent errors, guide patients and their companions through blood transfusion, detect and act on transfusion reactions and document the entire process.<sup>4</sup>

In this sense, this study is aimed at analyzing the nurses' performance while they deliver care during transfusion therapy.

## METHODS

It is a descriptive-exploratory research with both qualitative and quantitative approaches, which was carried out in a public teaching hospital. At the aforesaid hospital, the professional care is classified as tertiary and is qualified by the Ministry of Health (Brazil) as a high complexity unit in oncology.

Data collection took place over the period from September to December 2017. The sample was composed of nurses and nurse technicians.

Inclusion criteria were (1) professionals caring for patients who would undergo blood transfusion and (2) patients who agreed to participate in the research after signing the informed consent document.

The data collection consisted of two stages. In the first stage, an interview was conducted, which lasted 30 minutes on average, by using a semi-structured questionnaire containing open and closed questions. The following variables were included in the questionnaire: training and job function of the professional, knowledge about the blood transfusion protocol used within the institution, application of the care protocol before, during and after transfusion.

The second stage was carried out by observing the professionals during their activities. The observation was guided through the use of a checklist containing a roadmap of actions that should be performed by the professionals during transfusion in accordance with the protocol in force within the institution.

After data collection, a search in the literature was conducted to help with the discussion of results. The Virtual Health Library (VHL) was used, which contains the Scientific Electronic Library Online (SCIELO) and Medical Literature Analysis and Retrieval System Online (MEDLINE) databases. The articles published in the last five years were prioritized. The following descriptors were used during the search: Blood transfusion, Nursing Care and Patient Safety.

Data analysis was performed by using a Microsoft Excel spreadsheet for presenting simple frequencies and absolute values.

For the analysis of the data collected through the interviews, the thematic analysis was conducted, in which the reading of the material and delimitation of relevant themes and sub-themes were carried out to meet the objective of the research.

The study followed the ethical standards stated by the Resolution No. 466/12 from the Brazilian National Health Council.<sup>5</sup> Furthermore, it was approved by the Human and

Animal Research Ethics Committee from the *Universidade Federal de Goiás* (UFG) under Legal Opinion No. 2.210.019.

## RESULTS AND DISCUSSION

The study unit had 11 nurses and 73 nurse technicians, totaling 84 professionals. During the data collection, one nurse

technician was on medical leave, and ten were on holiday.<sup>31</sup> The professionals were interviewed and observed, which represented 37% of the professionals working in the clinic.

Considering the 31 nursing professionals who participated in the study, 24 were nurse technicians (77%) and seven were nurses (33%). The data characterizing the population can be seen in **Table 1**.

**Table 1** – Characterization of the study population.

Data	Nurse technicians (n)	(%)	Nurses (n)	(%)
<b>Gender</b>				
Male	01	4.2	00	0.0
Female	23	95.8	07	100
<b>Length of professional activity</b>				
No. of professionals who worked for less than five years	02	8.3	02	28.6
No. of professionals who worked for 5-10 years	10	41.7	03	42.8
No. of professionals who worked for more than 10 years	12	50.0	02	28.6
<b>Transfusion care</b>				
No. of professionals who reported being able to perform the procedure	02	8.3	03	42.9
No. of professionals who reported not being able to perform the procedure	22	91.7	04	57.1
No. of professionals who received specific training	02	8.3	02	28.6
No. of professionals who received no specific training	22	91.7	05	71.4
No. of professionals who reported the need for training	22	91.7	05	71.4
No. of professionals who did not report the need for training	02	8.3	02	28.6
No. of professionals who have already witnessed a reaction	24	100.00	07	100.0
No. of professionals who reported knowing how to identify a reaction	24	100.00	07	100.0

Regarding the 24 nurse technicians, only one (4.1%) was male, the majority being 31-51 years of age and working in the health care area for more than five years.

Despite working in the health care area, only two technicians reported feeling able to properly perform a blood transfusion because they received specific training and worked for blood-bank. The other technicians reported not being able to perform a blood transfusion because they received no specific training.

As for the interviewed nurses, all were female and aged between 27 and 35 years. The majority (71.4%) of them had been working in this area for more than five years.

Among the nurses, only two (42.8%) reported being able to perform a blood transfusion. Two professionals (28.6%) stated that they received specific training on this care. The other professionals reported never having been trained in this service.

Technicians and nurses reported having interest and need to receive specific training to care for patients undergoing transfusion therapy.

All team members reported having witnessed at least one transfusion and knowing how to recognize the inherent signs and symptoms. They stated that they report any transfusion-related incident to the physician on duty and perform proper care after medical evaluation.

It should be emphasized that actions expected to be followed by workers within the institution such as reporting the incident to the transfusion department, sending the blood bag for analysis and notifying the adverse event were not mentioned by the participants.

The observation step was performed during the period of time in which the participants provided care for patients submitted to transfusion. The items observed were: adherence to hand washing, use of personal protective equipment (PPE), compliance with patient identification protocol, execution of safe blood transfusion, patient care during blood transfusion and patient care during transfusion incidents. The obtained data are shown in **Tables 2 and 3**.

**Table 2** – Data collected by observing the process of caring for patients before undergoing blood transfusion.

Observed items	Nurses n=7 (23%)		Nurse technicians n=24 (77%)		Average of compliance (ȳ)	
	Yes	No	Yes	No	Yes	No
Performing hand hygiene	5 (71%)	2(29%)	16(67%)	8(33%)	0.5	5
Using gloves	7(100%)	-	12(50%)	12(50%)	9.5	6
Using a mask	6(85%)	1(15%)	10(42%)	14(58%)	8	7.5
Checking the medical prescription	7(100%)	0	24(100%)	0	15.5	0
Checking the patient's full name	7(100%)	0	24(100%)	0	15.5	0
Comparing the patient's data with blood bag data	0	7(100%)	0	24(100%)	0	15.5
Double-checking	0	7(100%)	0	24(100%)	0	15.5
Double-checking by two different technicians	0	7(100%)	0	24(100%)	0	15.5
Recording on the patient's protocol whether the right blood component recipient was transfused into the patient	0	7(100%)	0	24(100%)	0	15.5

### Observance to hand washing

There was low adherence to handwashing by the nursing team during transfusion care. The observation step revealed that 68% of the professionals practiced the procedure (five nurses and 16 technicians).

This rate is similar to a study on the adherence of health care professionals to hand washing<sup>6</sup> which was carried out in 2014. In this case, the nursing team represented 75.3% of the sample. According to the study, 81.8% of the nurses and 83% of the nurse technicians adhered to hand hygiene.

Not adhering to hand hygiene while delivering care for patients goes against the recommendations of the Brazilian National Health Surveillance Agency,<sup>7</sup> which emphasizes that washing hands before and after the contact with the patient reduces the transmission of microorganisms, contributing to the prevention of damage, being an essential and indispensable procedure to avoid the transmission of healthcare-related infections and consequently reduce morbidity and mortality rates.<sup>8</sup>

### Use of personal protective equipment

Health care professionals are subject to risks during work and have the responsibility of using PPE. This is the most appropriate way to prevent cross-contamination and occurrence of occupational accidents.<sup>9</sup>

The study results showed that there was low compliance with biosafety standard behavior such as the use of gloves and masks for handling biological materials.<sup>10</sup> In this regard, 61% of the professionals complied with this protocol, and 52% adhered to the use of a mask when caring for the patient or handling the blood bag, which represented an adherence average of 9.5 and 7.5, respectively.

Over time, scientific research has shown that the transmission of infectious diseases within the occupational health care environment has driven the development of protocols for standard precautions. The use of items such as masks, caps,

and goggles are recommended for procedures in which there is the possibility of splashing blood and other bodily fluids onto the mouth, nose, and eyes of the professional.<sup>11</sup> Adherence to these standards is the strategy that aims to reduce the contamination risks for both patients and professionals.<sup>12</sup>

### Compliance with patient identification protocol

The correct and continuous identification of the patient is considered an indispensable action to promote quality, effective and safe care. In this way, it aims at the individualized care, error reduction and damage prevention. Ensuring safe practices is a duty for professionals and a right for patients.<sup>13</sup>

Concerning the transfusion procedure, safe identification includes checking personal data (patient's name, mother's name, date of birth, diagnosis, chart number, unit, blood type, among others) and data related to transfusion history (prior transfusion, prior transfusion reactions, need for specific preparation before the transfusion, among others).<sup>14</sup>

Regarding the compliance with the patient identification protocol, it was found that during the process of delivering care for patients who underwent hemodialysis, all nursing professionals checked only the medical prescription and the full name of the recipient. They did not check whether the patient's identification data corresponded to the data from the blood bag. Furthermore, they did not double-check whether the blood component to be transfused in the recipient was correct.

Wrongly identifying the patient who will undergo a transfusion represents a crucial failure in the care process and involves serious risks that may culminate in incidents of temporary disability, need for medical intervention, prolonged hospitalization, morbidity and death.<sup>15</sup> A study published in 2016, which analyzed incidents during blood component transfusion, concluded that failures related to patient identification are one of the major causes of serious errors associated with blood transfusion.<sup>16</sup>

**Table 3** – Data collected by observing the process of delivering care for patients undergoing blood transfusion.

Observed items	Nurses n=7 (23%)		Nursing Tech. n=24 (77%)		Average of compliance ( $\bar{y}$ )	
	Yes	No	Yes	No	Yes	No
Performing only peripheral venipuncture	0	7(100%)	0	24(100%)	0	15.5
Administering pre-blood transfusion medication	5(71%)	2(29%)	24(100%)	0	14.5	1
Connecting the blood bag tubes by using the aseptic technique	0	7(100%)	0	24(100%)	0	15.5
Checking the label's adhesion	0	7(100%)	0	24(100%)	0	15.5
Performing macroscopic inspection of the blood bag	0	7(100%)	0	24(100%)	0	15.5
Checking blood bag integrity	0	7(100%)	0	24(100%)	0	15.5
Observing the patient rigorously and in person within the first 10 minutes	0	7(100%)	0	24(100%)	0	15.5
Observing the patient during transfusion	0	7(100%)	0	24(100%)	0	15.5
Checking vital signs: 30min/ 1h/2h/3h/4h	0	7(100%)	0	24(100%)	0	15.5

### Execution of safe blood transfusion

To ensure safe blood transfusion, the entire blood cycle must be monitored, which includes pre-transfusion, transfusion and post-transfusion procedures that are performed by a multiprofessional health care team.<sup>15</sup>

Institutional protocols for monitoring the blood transfusion stages aims to systematize the process and ensure the effectiveness of actions, which requires the development of strategies to provide adequate training for the professionals and, as well as their adherence to standard procedures.<sup>10,14</sup>

It was verified that all members of the technical nursing team followed the medical prescription carefully by administering pre-transfusion medications at the right time. Premedication is indicated to prevent recurrence of transfusion reactions in patients who have already presented symptoms related to the transfused blood component such as chills and fever. Although prophylactic premedication is part of the routine care provided within the institution, it is not mandatory as recommended by the Brazilian Health Ministry.<sup>17</sup>

In addition to monitoring the administered medications, the nursing team is responsible for providing care for patients before they undergo the blood component transfusion, such as monitoring of vital signs (blood pressure, heart rate, respiratory rate, and temperature), record the date and time of the start of transfusion, certification of exclusive access route for infusion of the blood component, clarification of the procedure by professionals and the record of all procedures related to transfusion care.<sup>15,17</sup>

However, during transfusion installation, it was noticed that all nursing professionals did not correctly perform the recommended care during bag installation, providing a higher risk of adverse events after blood component inoculation,

since this is a complex therapy classified as a transplant because it involves cellular components.<sup>15</sup>

The non-observance of care such as checking vital signs, a record of actions, availability of exclusive route for the infusion of the blood component also comes against a technical opinion issued by the Brazilian Federal Nursing Council. It states that nurses and nurse technicians are responsible for confirming the identification of the patient; label of the blood bag; data of the release label; validity of the product; and visual inspection of the bag (color and integrity) as well as its temperature through double-checking in order to promote the safety of the patient. Low adherence to these standards contributes directly to the increase of pre-transfusion, intra-transfusion, and post-transfusion failure.<sup>18</sup>

It is necessary to emphasize that the registration of nursing care provided to the patient undergoing blood transfusion also requires a specific instrument, in order to ensure accuracy of information about the procedure, safe communication, proper investigation of possible adverse events and improve administrative management, such as profit.<sup>19</sup> Application of instruments for registering information related to transfusion therapy was not observed in the study institution.

### Patient care during the blood transfusion

Regarding the excellence in hemotherapy care, some aspects are essential for the safety and quality of the services provided throughout hemodialysis such as: monitoring the patient in person within the first ten minutes of the blood component infusion, monitoring vital signs at and after the end of the procedure (intervals of 30min/1h/2h/3h/4h) and observing signs and symptoms that suggest a transfusion reaction.<sup>15-17</sup>

The study findings showed that none of the nursing professionals complied with the recommendations on

patient follow-up within the first ten minutes of blood component infusion nor checked or recorded his/her vital signs as recommended. The hemocomponent is a biologically active product, and most transfusion reactions are classified as immediate (occurrence within 24 hours after infusion), presenting higher incidence in the first minutes of infusion, which justifies the importance of rigorous and careful monitoring since the beginning of the procedure.<sup>16</sup>

In the face of signs or symptoms suggesting transfusion reactions, the nursing team should be able to at least take appropriate action for each type of reaction. The professionals who provide care for the patient should be attentive, as well as present the vital signs that will provide important parameters for a more complete evaluation and more assertive conduct by the assistance team.<sup>18</sup>

### Patient care during transfusion incidents

Other important items related to transfusion reactions could not be analyzed because there were no adverse transfusion reactions throughout data collection, which made it impossible to observe fundamental care actions such as checking the label on the blood component bag after the reaction, reporting the incident to the hemotherapy department and the physician on duty, providing care and filling out the incident notification form.

### CONCLUSIONS

Blood transfusion therapy is a complex process that needs to be performed by trained professionals because possible complications can cause serious damage to patients. Nevertheless, the study results pointed out that most of the professionals reported not feeling able to provide this care and needed specific training to perform it.

Non-compliance with hand washing and other biosecurity standards (for example the patient identification protocol and correct use of PPE) was also observed.

It was verified that the professionals followed the medical prescription carefully, with the proper administration of pre-transfusion medications. On the other hand, actions aimed at monitoring the patient throughout therapy, such as the control of vital signs and follow-up during the first ten minutes of blood component infusion, were not prioritized.

Another important point was the lack of information on transfusion therapy, in order to ensure accurate information on the procedure, safe communication and timely investigation of possible related adverse events.

Bearing in mind the study results, it is suggested that the continuous training of the nursing team is essential for the adequate follow-up of the patient undergoing blood transfusion therapy, as well as the implementation of specific

instruments to ensure the systematization of care and accurate recording of information.

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Received on: 22/03/2018

Reviews required: Did not have

Approved on: 13/12/2018

Published on: 05/01/2021

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