

NURSING ACADEMIC KNOWLEDGE ABOUT BONE MARROW DONATION**CONHECIMENTOS DE ACADÊMICOS DE ENFERMAGEM SOBRE DOAÇÃO DE
MEDULA ÓSSEA****CONOCIMIENTO DE ACADÉMICOS DE ENFERMERÍA SOBRE LA DONACIÓN
DE MÉDULA ÓSEA**

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ABSTRACT

Objective: to analyze the knowledge of nursing undergraduate students about bone marrow donation. **Method:** This is a descriptive, exploratory research with a quantitative approach, for which a questionnaire was applied to students in the 1st, 5th and 10th semesters of the course, totalizing a sample of 114 academics. **Results:** the majority 89 (78.1%) were women, with frequency of age from 19 to 29 years (35.1%). We verified that only 7 (6.1%) answered that the topic was explored during graduation. However, 110 (96.5%) consider it important to discuss the subject in academic training. **Conclusion:** the scholars' knowledge about the donation of bone marrow was unsatisfactory, which is due in part to the little or no contact they had with the subject at the undergraduate level. We consider it important to include this subject in the undergraduate, to train professionals capable of dealing with the demands that emerge from society.

Descriptors: Bone Marrow; Tissue and Organ Procurement; Students.

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RESUMO

Objetivo: analisar o conhecimento dos acadêmicos do curso de graduação em enfermagem sobre doação de medula óssea. **Método:** pesquisa descritiva, exploratória com abordagem quantitativa, para cuja realização foi aplicado um questionário direcionado a alunos do 1º, 5º e 10 semestres do curso, totalizando uma amostra de 114 acadêmicos. **Resultados:** a maioria 89 (78,1%) eram mulheres, com maior frequência de faixa etária nos três semestres de 19 a 29 anos (35,1%). Verificamos que somente 7 (6,1%) responderam que o tema foi abordado durante a graduação. Contudo, 110 (96,5%) consideram importante a discussão da temática na formação acadêmica. **Conclusão:** o conhecimento dos acadêmicos sobre a doação de medula óssea foi insatisfatório, o que se deve em parte, ao pouco ou nenhum contato que os mesmos têm com o tema na graduação. Consideramos importante a inclusão dessa temática na graduação, para formar profissionais capacitados para lidar com as demandas que emergem da sociedade.

Descritores: Medula Óssea; Obtenção de Tecidos e Órgãos; Estudantes de Enfermagem.

RESUMEN

Objetivo: Analizar el conocimiento de los estudiantes de la licenciatura en enfermería sobre la donación de médula ósea. **Método:** Estudio descriptivo, exploratorio con enfoque cuantitativo para la realización de los cuales fue un cuestionario dirigido a los estudiantes de 1, 5 y 10 semestres, con un total de 114 estudiantes. **Resultados:** La mayoría de 89 (78,1%) eran mujeres, con más frecuencia de la edad en 19-29 años (35,1%). Se encontró que sólo 7 (6,1%) respondieron que la cuestión era abordado durante la graduación. Sin embargo, 110 (96,5%) consideran importante el tema de discusión en la educación académica. **Conclusión:** el conocimiento de los académicos no fue satisfactoria, lo cual se debe en parte al poco o ningún contacto que tienen con el tema de la graduación. Consideramos que es importante incluir este tema en la graduación, para formar profesionales capaces de hacer frente a las demandas emergentes de la sociedad.

Descriptor: Médula Ósea; Obtención de Tejidos y Órganos; Estudiantes de Enfermería.

INTRODUCTION

Bone marrow is a gelatinous tissue found inside the bones, which contains the stem cells responsible for hematopoiesis. These cells are responsible for the formation of white blood cells, red blood cells and platelets, where the original cells self renew or differentiate, passing through several stages of maturation before they pass into the blood.¹ Any individual in the age group between 18 and 55 years , and

who is in good health can register to be a voluntary donor.²

Bone marrow transplantation consists of replacement of diseased or deficient tissue by healthy cells between compatible individuals, related or not, for the purpose of tissue reconstitution. The compatibility between siblings of the same father and mother is 25% and between unrelated individuals the chance of compatibility drastically reduces to 1 / 150,000.¹

Although Brazil has doubled the number of bone marrow transplants, with approximately 118%, presenting 11,203 surgeries in 2002 to 24,473 in 2012, there is still the need for capitation of new volunteers, given that the number is still insufficient to meet demand.³

Hematopoietic stem cell transplantation, better known as bone marrow transplantation, has been used in several treatments as an alternative therapy, when the conventional ones do not offer a satisfactory prognosis. It is an effective procedure in cases of hematological diseases, such as bone marrow failures, acquired disorders, autoimmune diseases and hematological alterations, and in several types of neoplasias such as leukemias, lymphomas and solid tumors.⁴ The annual frequency of transplantation of bone marrow as well as success rates are growing exponentially due to knowledge of the human histocompatibility system and accurate examinations in the selection of bone marrow donors.⁵

It is described that disinformation about transplantation can cause insecurity in the people involved in the donation. Lack of knowledge about bone marrow donation as well as doubts that often come from erroneous comments of common sense based on cultural mysticism are

factors that certainly interfere with the decision to be a donor or not. Educating students early in their careers can become crucial in this context, since health professionals are responsible for the reception of the patient undergoing treatment for bone marrow transplantation, in this context it is essential to educate them for better adherence to treatment.⁶

Thus, the present study does not aim to exhaust the theme, but to support reflections on the subject, building a theoretical basis with the potential to subsidize a movement of changes in nursing undergraduate curricula, providing clear and concise information about the basic concepts which involve the process of donating and transplanting bone marrow.

Given the recognition of the importance of nurses in the process of donating and transplanting bone marrow and through the understanding that these professionals need to be prepared from the academic life to act in the various contexts, the need arises to verify the knowledge of the nursing academics about the thematic, allowing to know the level of information of the students of the Undergraduate Nursing Course, the importance of the discussion on the subject in the academic and social environment. Therefore, the clarification and sensitization of nursing

academics about bone marrow donation is essential, considering the importance of the nursing professional in the process. The question that drives this study is: what is the knowledge of nursing academics about donation and bone marrow? This study aimed to analyze the knowledge of the undergraduate Nursing students about bone marrow donation.

METHOD

It is a descriptive, exploratory research with a quantitative approach. The study was carried out in a Private Higher Education Institution of Belém, State of Pará, in the period of September, 2015. The casuistry consisted of all the students enrolled in the 1st, 5th and 10th semesters of the course, totaling 160 students. There was a loss of the sample, which now has 130 individuals. The decrease was due to reasons such as enrollment, sick leave, among others. As inclusion criteria, they were considered to be academics of the baccalaureate course in nursing, duly enrolled in the evening and evening shifts of both genders, who are of legal age. The choice of the semesters occurred because we considered that by including students enrolled in the initial, intermediate and final phases of the course, they would provide an insight into the level of knowledge of the students about the

subject, and at what moment of the course there was the students' contact with the subject.

A 5% margin was adopted as a sample error, with a confidence level of 95%, establishing as a sample $n = 114$ academics, 71.3% of the initial sample, 41 of the first, 47 of the fifth and for the purpose of the sample calculation a systematic random sampling was used on categorical variables using the following formula⁷:

$$n = N \cdot Z^2 \cdot p \cdot (1 - p) / \overline{Z^2 \cdot p \cdot (1 - p) + e^2 \cdot (N - 1)}$$

Such as:

n - calculated sample

N - population

Z - standardized normal variable associated with the confidence level

p - true probability of the event

e - sample error.

A brief meeting with students in the classroom was scheduled, explaining the methodology and objectives of the research. After clarifying the doubts about the study, the Free and Informed Consent Form was given with the appropriate guidelines to be analyzed and signed by the respondents. A structured questionnaire was used with semi-closed and closed questions, built by the researchers to reach the purposes of the study and applied in loco. The questionnaire was self-administered and presented in two parts:

Part 1 - Biographical Data; Part 2 - Knowledge of bone marrow donation.

After data collection, these were organized and categorized by similarities of information and presented in the form of charts and tables with simple frequency. Corroborating and respecting the pre-established rules, rules and guidelines proposed by the Research Committee involving human beings, defined in Resolution 466/12 of the National Health Council of the Ministry of Health, this research was submitted and approved by the Research Ethics Committee of the University Center of Maranhão

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RESULTS

PART 1: BIOGRAPHICAL DATA

Of the 114 participants in the survey, 89 (78.1%) were female and 25 (21.9%) were male. The highest age range in the three semesters was 19 to 29 years (35.1%). As for marital status, the majority 75 (65.8%) were single. The naturalness of the academics was exclusively Paraense according to Table 1.

Table 1: Biographical data of n = 114 academics. Belém / PA, year 2015.

Characterization of the sample		Nº	%
Gender	Female	89	78.1
	Male	25	21.9
Age	19-29 years	40	35.1
	30-39 years	35	30.7
	40-49 years	28	24.6
	50 years or more	11	9.6
Marital status	Single	75	65.8
	Married	29	25.4
	Divorced	6	5.3
	Stable Union	4	3.5
Naturalness	Paraense	114	100

Source: Field research, 2015.

PART 2: KNOWLEDGE OF BONE MARROW DONATION

Regarding knowledge about bone marrow function, the majority of participants 70 (61.4%) reported being aware of this. However, when questioned

about bone marrow function, 40 (57.1%) adequately conceptualized and 30 (42.9%) responded inadequately. It should be noted that the highest frequency of inadequate answers occurred in the fifth semester with 15 errors, followed by 11 in the first

semester and 4 in the 10th semester according to Table 2.

Table 2: Correlation of knowledge and concept about bone marrow function of n = 114 academics. Belém / PA, year 2015.

Knowledge	1st Semester		5th Semester		10th Semester		Total sample	
	N	%	N	%	N	%	N	%
Yes	20	48.8	34	72.3	16	61.5	70	61.4
No	21	51.2	13	27.7	10	38.5	44	38.6
Total	41	100	47	100	26	100	114	100
Concept								
Appropriate Answer	9	45	19	55.9	12	75	40	57.1
Inappropriate Answer	11	55	15	44,1	4	25	30	42.9
Total	20	100	34	100	16	100	70	100

Source: Field research, 2015.

When questioning about the location of the bone marrow 70 students (61.4%) answered to know the location, the sites pointed out by them were: spinal cord; bones; internal cavity of bones, flat bones and long bones, of these 36 (51.4%) responded correctly. Of the three semesters, those with the highest

graduation time presented higher rates of inadequate answers, with 17 (24.3%) in the fifth semester, followed by the 10th semester with 10 (14.3%) and finally the first semester 7 (10.0%), according to Table 3.

Table 3: Correlation of knowledge and concept about the location of the bone marrow of n = 114 academics. Belém / PA, year 2015.

Location	1st Semester		5th Semester		10th Semester		Total sample	
	N	%	N	%	N	%	N	%
Yes	21	18.4	31	27.2	18	15.8	70	61.4
No	20	17.5	16	14.0	8	7	44	38.6
Total	41	35.9	47	41.2	26	22.8	114	100
Concept								
Appropriate Answer	14	20	14	20	8	11.4	36	51.4
Inappropriate Answer	7	10	17	24.3	10	14.3	34	48.6
Total	21	30	31	44.3	18	25.7	70	100

Source: Field Research, 2015.

Regarding the contact of scholars with the subject in the undergraduate program, 98 (86%) reported that the subject was not addressed, being 40 (35.1%) in the fifth semester, 37 (32.5%) in the first semester and 21 (18.4%) of the tenth semester. It is important to note that only 7 (6.1%) answered that the subject was approached during graduation, of these 5 (4.3%) did not remember at what time of the course and 9 (7.9%) did not respond.

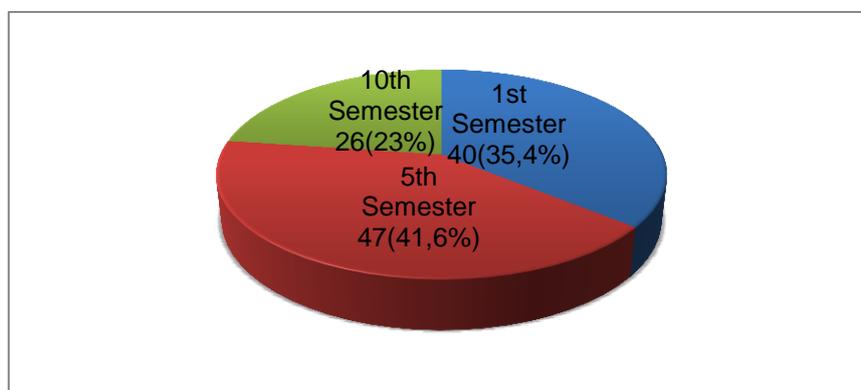
Regarding the academic knowledge about how to become a bone marrow donor, 71 (62.3%) answered not knowing and only 43 (37.7%) said they had some knowledge. Being that of these, when asked about the criteria needed to become a donor, the answers that predominated most were: 16 (37.2%) answered that it was necessary to have between 18 and 55

years of good health, 10 (23.3%) answered for compatibility, 9 (20.9%) to register at a hemocenter, 7 (16.3%) donor authorization and 1 (2.3%) for willingness to become a donor.

Concerning how bone marrow donation is performed, 84 (73.7%) were unaware of the collection procedure, 30 (26.3%) reported knowing, of which 13 (43.3%) answered such as through the spine, cerebrospinal fluid and surgeries in case of compatibility.

Concerning the results presented on bone marrow reconstitution, only one participant responded adequately, while 113 (99.1%) did not know how to respond and of these, 47 (41.6%) belonged to the fifth semester, 40 (35.4%) of the first and 26 (23%) of the tenth semester according to Graph 1.

Graph 1: Inadequate knowledge about bone marrow reconstitution of n = 114 academics. Belém/PA, year 2015.



Source: Field Research, 2015.

Knowledge of academics about the location of a hemocenter in the study city,

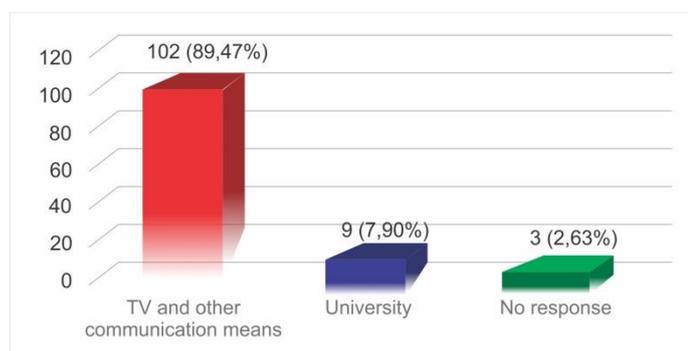
66 (57.9%) of the participants said they knew the place, 27 (40.9%) of the fifth

semester, 22 (33.3%) of the tenth semester and 17 (25.8%) of the first semester.

Concerning the source of information about bone marrow donation, it was found that of the 114 participants, a majority (89.47%) answered information about the

subject through TV and other means of communication, 9 (7, 9%) through the faculty and 3 (2.6%) did not respond. We reiterate that academics could choose more than one source for which they received information.

Graph 2: Knowledge information about bone marrow donation of n=114 academics.. Belém/PA, 2015.



Source: Field research, 2015.

Of the participants, the majority, 98 (86%) do not know about National Donor. Only 16 (14%) knew about the registry, and when asked about the medium of information acquisition, they answered that it was through: 6 (37.5%) television, 4 (25%) Hemocentro, 4 internet and 2 (12.5%) through newspaper. Regarding academic knowledge about the purpose of bone marrow donation, 80 (70.2%) were unaware and 34 (29.8%) answered that it was useful for treatments of blood diseases, transplants, treatment of leukemia and reconstitution of cells. Of those who knew how to respond, 35 (74.5%) were in

the fifth semester, 29 (70.7%) of the first semester and 16 (38.5%) of the tenth semester.

Concerning the importance of knowledge about bone marrow donation in the professional context, 110 (96.5%) of the participants consider it important. Of the total, 4 (4%) answered not to be important, being 2 (1.74%) in the first semester, 1 (0.9%) in the 5th semester and 1 (0.9%) in the 10th semester. Regarding the opinions of nurses on the functions performed by nurses at the moment of bone marrow uptake and transplantation, 65 (57%) did not give an opinion and 49 (43%) indicated information, evaluation,

orientation and clarification as nurses' functions.

DISCUSSION

The characterization of the nursing students surveyed showed that this population is predominantly female, young and single. Even with so many changes, nursing is still a profession mainly performed by women.⁸ Before the 1970s, when the participation of women in the labor market was reduced, nursing was among the professions that had the highest number of women employed, care as conditions of maintenance of life has always been attributed to the female gender until the days current.⁹

The predominance of unmarried academics is in agreement with other studies, where the prevalence of unmarried students in undergraduate courses has been demonstrated, due to the fact that the young population seeks independence and financial stability and only seek to establish a union when they feel mature and stable.¹⁰

The discussion about the subject matter within the nursing course is important for the training of future nurses, who can perform any part of the donation process of organs and tissues for transplantation. However, the present research demonstrated that a significant number of undergraduates do not have

basic knowledge about the subject, and the 5th semester is the group where this data was most evidenced. Bone marrow produces blood cells, where they originate from hematopoietic progenitor cells or stem cells¹, however, the researchers describe erroneous concepts that denote an empirical knowledge of common sense, such as saving lives, helping to cure diseases, responsible for the peripheral nervous system, help people.

Despite the lack of knowledge about bone marrow function, the majority reported knowing its anatomical location, however, almost half of this group responded inadequately when questioned about the specific site, with the 5th and 10th semesters being the groups with the highest levels of errors, with 17 (24.3%) and 10 (14.3%) respectively. We believe that in the first semester the error rate, 7 (10.0%) was lower because it is the graduation period in which they have a greater approximation with basic curricular components such as anatomy and human physiology.

Most academics confused the bone marrow with the spinal cord. It is important to note that there is no confusion between bone marrow and spinal cord because the bone marrow is a gelatinous tissue found inside the bones, whereas the spinal cord is formed by nervous tissue that

occupies the space within the vertebral column. This confusion shows the weaknesses of teaching-learning in the higher education of the institution.

Nursing training should include proximity to what is taught in the classroom with practice. By integrating real day-to-day professional issues so as to instrumentalize the development of interventions and research that can change reality. Studies show that there is a longing for a qualified formation with practical experiences that come to contemplate the student in totality.¹¹ However, amid a scenario of unquestionable changes and increasing demands, it is still observed that the theoretical-practical articulation does not occur satisfactorily, being explored superficially throughout the nurses training process. Such a gap between theory and practice can be perceived when the newly trained professional encounters situations that seem absolutely new, since they were not experienced and contemplated during the training or lived differently from the professional reality.¹²

The discussion throughout the course becomes necessary for the student to strengthen reflective thinking, not only on the function of the bone marrow, but also in relation to the donation, so that it can develop its function within the best practices, as well as to develop educational

activities with a view to strengthening and diffusing the theme. In this context, studies bring contributions about the successful experience held in the city of Catalão (GO), where the articulation of community teaching has brought contributions in relation to health education as a strategy in bone marrow recruitment, surpassing the expectation of registered donors in a mutual relationship of learning between academics and the community was observed.¹³

In addition to evidence of a lack of knowledge about the bone marrow and its anatomical location, more than half of the respondents stated that they had no contact with the subject in academic life. This corroborates with other studies, demonstrating that there is still a mismatch in addressing issues such as death, organ and tissue donation in higher education institutions.¹⁴

The knowledge regarding the subject within the Undergraduate Nursing Course is a necessary aspect, because during the training it is important that the future professional may be educating and contributing to the decrease of myths that surround the process of bone marrow donation.¹⁵ A study with university students in Texas revealed that lack of knowledge about the process of donating bone marrow contributes to the fear of the

process itself. Fear is an important barrier to bone marrow donation.¹⁶ Thus, we emphasize the need for investments and discussions on the subject in universities, so that health professionals, who are part of this field, can be the main mediators of the process of donation and bone marrow transplantation.

To develop a safe practice in the process of bone marrow donation, nurses need to understand the criteria needed to be a donor, however, a significant number of the study participants did not know how to report. According to the National Cancer Institute (INCA) to become a voluntary donor of bone marrow, it must be between 18 and 55 years old, be compatible with the recipient and have good health status.² The lack of information on the subject reflects fear and with it little acceptance of the population in relation to bone marrow donation.¹⁶

Bone marrow donation collection is still considered a taboo by society, and in the present study we identified the lack of knowledge about the collection procedure by the majority of the respondents, and that of the group that reported having the knowledge of the 30 academics, 13 responded inappropriately. According to the Association of Bone Marrow, the collection is done by means of a puncture of the iliac bone (iliac crest), sternum,

tibia, peripheral blood and umbilical cord. It may be withdrawn from 10 to 20 ml preferably in the iliac crest for better donor comfort.¹

Regarding the time of regeneration of the bone marrow after donation, 113 of the interviewees reported not knowing. It is noteworthy that the nursing students of the 5th and 10th semesters did not know how to respond, and almost all the students of the 1st semester also do not have this knowledge. According to INCA, the bone marrow recomposes itself completely in 15 days.⁶ This data raises a concern and opens space for discussion and new studies, given that students close to completing training and forming the labor market do not have the knowledge fundamental to subsidize their practice as a nurse in this context.

Regarding the location of a hemocenter, the results were not positive, because of the 114 students only 66 knew how to respond. It is worth noting that all nursing students are naturally from Pará, that is, with a greater possibility of having knowledge about the place. In the state of Pará, the Hemocentro is called the Center for Hemotherapy and Hematology of Pará, recognized as one of the most modern hemocentres in Brazil.¹⁷

About the media about the subject, only 9 students responded that it was through college, the rest went through

television and other media. In view of the result, it is important to reflect on the need for the teaching institution to develop actions that arouse in the student the yearnings, doubts and motivation for them to seek information about donation and bone marrow transplantation. We consider it important that institutions seek motivational measures and the implementation of extension projects that involve students with the community, improving the integration of teaching and service, bringing teachers and students closer to spaces where teaching and research problems emerge.¹²

We verified that there is an ignorance of the academic in relation to the register of voluntary donors of bone marrow, an expected fact, since, in the study, we observed the lack of discussion about the subject in the academic scope. The National Registry of Bone Marrow Donors is an INCA system that performs registrations of possible future bone marrow donors.¹⁸ Even with more than 3 million voluntary donors registered in the Brazilian Registry of Bone Marrow Voluntary Donors, the likelihood of finding an unrelated compatible donor is 1 / 150,000 and the gap between need and number of donations continues to increase.²

Bone marrow donation aims to treat defects acquired in the hematopoietic system or in the immune system. In addition, bone marrow transplantation can be used as part of the treatment of malignancies from tissue.¹⁶ We observed that more than half of the academics are unaware of the goal of bone marrow donation, and the 10th semester was the one that obtained the lowest index of correct answers. Taking into account that these students, due to the training period, should have more knowledge, since they are in the final phase of the course, we questioned the quality of the teaching focused on this subject in this institution and we encourage the establishment of a process of reflection on the curriculum, as well as suggest the insertion of the theme in a more incisive way in the academic experiences.

Although nursing academics have little knowledge about marrow donation and its purpose, almost all share the same idea about the importance of donation, however, four students presented a contrary position. Despite being a small sampling, it is worth mentioning, because the nurse develops several actions aimed at the donation of bone marrow, being considered an indispensable professional. Nursing develops educational activities, acts in the collection and transplantation of

organs, recruiting donors from various segments of society and needs to have a deep knowledge about the characteristics, signs and symptoms, types of treatment and side effects and the necessary nursing care.¹⁹ In addition, the nurse working in this area must have specific knowledge to elaborate a detailed therapeutic plan, since it acts decisively in all phases of the process.¹¹

Regarding the functions performed by the nurse in the collection and transplantation of bone marrow, we showed that a large part of the sample does not have knowledge about the duties of the nurse. According to the Federal Nursing Council no. 0511/2016 that approves the technical norm that establishes the performance of Nurses and Technicians of Hemotherapy in Nursing, the functions performed by the Nurse who works in the Transplantation of Hematopoietic Stem Cells range from the simplest to the most complex.²⁰ The nurse has a wide field of activities, since it is responsible for planning, executing, coordinating, supervising and evaluating nursing care at all stages of treatment and also for the education and guidance of patients and their families.

CONCLUSION

The present research demonstrated that the nursing students' knowledge about the process of bone marrow donation in the studied institution was unsatisfactory, which is due in part to the little or no contact they have with the subject during graduation. Thus, we reiterate the need to insert the theme in nurses' training. We consider it essential that the professional has contact with controversial issues such as the process of donation and transplantation of organs and tissues from the beginning of the course and improve knowledge in subsequent years, seeking to improve and promote discussions in their environment, whether at work, at home or even in their study environment, always based on scientific knowledge.

The nurse is a true link between the individual, family and community, mainly because this professional spends more time with the patient and consequently with their relatives in the various levels of health care. It is precisely this closeness that causes users and their families to seek information from the nurse, and this elucidation phase is essential, mainly because the discussion of the topic between friends and family encourages people to seek information about the subject, positively influencing the promotion of donation.

Therefore, nursing graduates need to be prepared and trained to fully assist users, both donors and recipients of bone marrow, and this preparation must take place from the academic experience through the inclusion of the issue in the context of higher education institutions, since the National Curricular Guidelines emphasize the need and the duty of higher education institutions to train health professionals focused on the Single Health System in order to adapt health education to the health needs of the population.

In spite of the relevance of this theme, we emphasize that the present study was developed in only one institution of higher education in the city of Belém, State of Pará, which may represent the limitation for inferences from these perspectives in other contexts. However, the study may contribute information relevant to the knowledge, analysis of the nurses training process and establishment of strategies, so that this theme is disseminated in the graduation in a more consistent way and collaborate so that the nurse is able to act as a promoter of the integral health of the human being, in its diverse fields of action. We recommend that the theme be included in the curricular designs of undergraduate courses, to train professionals able to deal with social demands, and with the questions and doubts of the community in

which they are inserted, opening space for discussion and preparation of new studies.

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