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## Initial care to burn victims: nursing students' knowledge: a cross-sectional study

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### ABSTRACT

**Problem:** The scientific literature has been pointing out gaps in the knowledge of nurses on the care of burn victims. **Aim:** To determine the theoretical knowledge of nursing students on the initial care to burn victims in emergency units. **Method:** Cross-sectional study involving 107 nursing students from four higher education institutions in the Metropolitan Area of Maringá (PR), using a semi-structured questionnaire for data collection. Association was evaluated using the chi-square test, with significance level  $p \leq 0.05$ . **Results:** Only 22.4% of the students had adequate knowledge. There was an association between satisfactory knowledge and belonging to a public institution (OR = 3.1,  $p = 0.01444$ ), having performed nursing care in the initial treatment of burn victims (OR = 3.6,  $p = 0.006530$ ), and having witnessed the initial care to burn victims (OR = 2.7,  $p = 0.03431$ ). **Conclusion:** The lack of knowledge demonstrated by students reveals the need to rethink teaching strategies so that they promote improvements in the knowledge of these scholars.

**Descriptors:** Burns; Emergency Nursing; Knowledge; Students Nursing; Education Nursing.

## INTRODUCTION

Accidental burning and its consequences are real public health problems, since the victims represent a heavy social and economic burden over their long period of hospitalization and recovery process. It is among the most complex and severe trauma types, since important consequences can occur, such as scars and other physical consequences. Burns may lead to disability, psychological distress and disfigurement, resulting in a longer recovery period<sup>(1)</sup>.

Research studies concerning knowledge about the proper care of burn victims – conducted in Australia<sup>(2)</sup>, the Netherlands<sup>(3)</sup>, England<sup>(4)</sup> and Brazil<sup>(5)</sup> with health professionals, including nurses – have shown gaps in theoretical knowledge and its attendant technical-assistance practices.

In Brazil, few studies have assessed the knowledge and training of health professionals regarding the provision of care to burn victims. In a study conducted in a teaching hospital in the Northwestern region of Parana, a facility known in the metropolitan region as the main choice to the provision of care to burn patients, it was found that the assessment of burns by professionals was based on two parameters: depth and location of the lesions. There was no reference to the measurement of burned body surface, information that is critical to the definition of the proper conduct and referrals<sup>(6)</sup>.

Nevertheless, injuries relating to burns have a high epidemiological impact. The World Health Organization estimates that approximately 195,000 deaths/year are caused by fire accidents worldwide, including mortality from burns involving other agents<sup>(7)</sup>.

Recently, the city of Santa Maria (RS) was host to a tragedy resulting from a fire in a nightclub, which led to the immediate deaths of 236 young people, and the hospitalization

of 169 more, due to inhalation of toxic gases (carbon monoxide and cyanide) and burns. This event highlighted the high level of complexity involved in providing care to burn victims and the difficulties facing professionals in the handling of each case.

The proper treatment of burn patients, which includes initial care, should aim to preserve the zone of stasis (a potentially viable area surrounding the central area of the lesion), which is essential to limit the depth of burn progression and, consequently, more sequelae and even death<sup>(2)</sup>.

The initial care provided to burn victim (AIQ) is the care provided within the hospital immediately after the patient's arrival to the stabilization room, in a time range of between 48 and 72 hours after the trauma. It is crucial, in this moment, to stop the burning process and minimize the conditions that put the patient's life at risk<sup>(8)</sup>.

The initial treatment of the victim is performed in emergency units, amid the tension that permeates the daily activities of these professionals. The working conditions in these environments are characterized by the possibility of daily, uninterrupted treatment of critically ill patients who require immediate care and who are at risk of death<sup>(9)</sup>.

The provision of initial care should always be performed quickly and accurately, by a multidisciplinary team acting in synergy. If the professionals who perform this service lack the requisite knowledge, skills and techniques, they may alter the course and prognosis of the patient, producing secondary and especially systemic injuries, rather than leading victims to healing and rehabilitation<sup>(8)</sup>.

In this sense, the theoretical knowledge, and the articulation of this knowledge as a guideline to govern health practices, are paramount for nursing professionals working in

critical situations, including providing services to burn patients at trauma centers<sup>(10)</sup>. Thus, the team in charge should base their assistance on established scientific principles, and the nurses are the ones responsible for carrying out the treatment of the most complex cases<sup>(8)</sup>.

Nursing is a profession that combines science and art, and has fundamental principles that serve as the foundation to its theoretical and practical knowledge. With regard to the nursing care of critically ill patients, a nurse should use clinical reasoning (formulated through the interaction between scientific evidence and experiences accumulated throughout their professional practice) for decision-making. Theoretical knowledge, understood as the knowledge which comes from theory and research, must be used to support and improve health practices<sup>(11)</sup>.

From this perspective, it becomes necessary to verify the theoretical knowledge of nursing students when providing initial assistance to burn victims, since research into this area will enable an evaluation of the level of professional preparation and the quality of education, thereby providing resources for training improvements.

Given the above, our goal was to verify the theoretical knowledge of nursing students in public and private higher education institutions regarding the initial care to burn victims in emergency units.

## METHOD

Our chosen method is a cross-sectional study, conducted in November 2012, involving nursing students in the Metropolitan Region of Maringá (RMM), Paraná. The RMM is located in the northwest of the state, with 26 municipalities and more than 700,000 inhabitants. Three cities offer nursing university courses: Maringá,

Ivatuba and Mandi, which have a population of 357,117, 3,008 and 32,658 inhabitants, respectively<sup>(12)</sup>.

The selection of Higher Education Institutions (HEIs) for the study was dictated by the presence of students enrolled in their final semester of undergraduate nursing courses, as an inclusion criterion. Five HEIs met the established criteria; however, one of them could not accomplish data collection since their school year had already ended.

Of the four selected HEIs, three are located in Maringá and one in the city of Ivatuba, with a total of 136 students enrolled in these courses last semester.

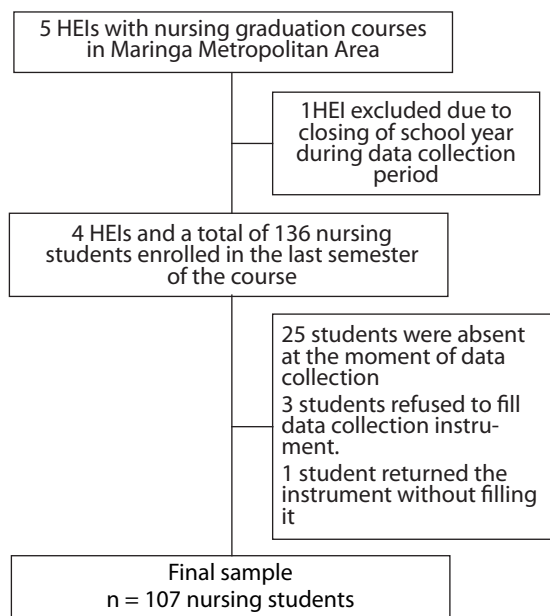
The study population was composed of the graduating students - enrolled in the final semester of undergraduate nursing programs, in the 2012 academic year, and present in class on the date allocated to the application of the data collection instrument - regardless of the number of different disciplines in which they were enrolled. Of the 136 nursing students eligible for the survey, 107 (79.3%) responded to the survey instrument.

The losses, totaling 29, resulted from students refusing to fill in the instrument for data collection (3 to 10.3%), being absent at the time of data collection (25 - 86.2%) and returning the data collection instrument without filling it in (1 to 3.5%) (Figure 1).

In order to collect data, we used a tool developed for research into knowledge regarding the provision of initial care to burn victims in emergency units. It is a modular and structured tool, self-administered, with multiple-choice questionnaire, divided into four blocks: **Block I:** sociodemographic and socioeconomic characteristics script, adapted from Santos<sup>(13)</sup>; **Block II:** sources of information and school situation script, also adapted from Santos<sup>(13)</sup>; **Block III:** script concerning primary contact of the

students with the theme and their degree of interest in it, prepared for the purposes of this study; and **Block IV**: a questionnaire for analysis of knowledge about the provision of initial care to burn victims, developed and validated by Balan<sup>(5)</sup>.

**Figure 1.** Flowchart of the selection of HEIs with nursing courses in the RMM and nursing students enrolled in the final semester of nursing courses. Maringá (PR), Brazil, 2012



The questionnaire for the analysis of knowledge about the initial care of burn victims<sup>(5)</sup> contains 27 questions relating to AIQ, with three response options (agree, disagree, do not know).

The research instrument was administered by the researcher in the four HEIs, in classrooms during a single period, in order to ensure greater reliability to the methodological process. The instrument response time varied between 26 and 31 minutes.

For the analysis of the 27 knowledge questions, a value of “one point” was assigned to each correctly answered question. The answer “do not know” was computed as “incorrect” for performing statistical analysis. The knowledge was treated dichotomously as satisfactory or un-

satisfactory, and any percentage greater than or equal to 60% accuracy in the answers obtained was considered satisfactory. This parameter was used by HEIs in this study to evaluate the students.

The data were entered electronically into a Microsoft Excel<sup>®</sup> spreadsheet, and then processed and analyzed using the *Epi Info7*<sup>®</sup> program through descriptive statistics, with the presentation of the frequency distribution. To verify the association between the response-knowledge variable, and the socioeconomic, sociodemographic, school status variables, personal interest and previous contact with AIQ, we used the chi-square test of independence, with Yates correction when indicated, with a significance level of  $p < 0.05$ . The Odds Ratio (OR) was used to measure the magnitude of the association between the variables and their respective confidence interval (95% CI).

The survey was conducted after prior authorization from the HEIs and approval by the Ethics Committee on Human Research of the State University of Maringá (COPEP / UEM), with Opinion No. 160 458/2012, according to Resolution 466/2012<sup>(14)</sup>.

## RESULTS

The sample included 107 nursing students, 39 (36%) from a public institution and the rest (64%) distributed between three private institutions.

Regarding the theoretical knowledge of nursing students concerning the provision of initial care to burn victims, considering a percentage equal to or greater than 60% as a satisfactory knowledge rate, it was found that only 22.4% had adequate knowledge, and the average accuracy of 27 questions was  $14.04 \pm 3.19$ , which corresponds to 51.5% of the total.

As shown in Table 1, there was a higher percentage of adequate knowledge when comparing single (23.9%) and married individuals (15.8%); family income equal to or greater than five minimum wages (26.9%) and income of up to four minimum wage salaries (18.2%); unemployed and employed individuals (27.3% and 14.6%, respectively); Maringá citizens (25.0%) and citizens from other municipalities (16.1%); students residing in urban (24.5%) and rural areas (7.7%). The variables of gender, age, color and parental education showed close percentages of adequate knowledge in all their subcategories. However, considering a significance level of 5%, none of the sociodemographic and economic variables could be significantly associated with the possession of satisfactory knowledge.

We can see in Table 2 that, comparing the school history of the students, those who primarily attended private schools for high school and studied in morning/afternoon periods showed a higher percentage of satisfactory knowledge (29.5% and 23.7%, respectively) compared to those who primarily studied at public schools and at night. Those students who did not attend pre-university courses, and those who attempted between one and three vestibular exams to join the degree course, demonstrated a lower percentage of satisfactory knowledge. Of the five students who had other previous college education, none demonstrated adequate knowledge; among those who already had a nursing technical course, 30.8% had satisfactory knowledge, while for those who did not have this experience, the percentage was 21.3%.

Considering the current academic situation of nursing students, a significant association is indicated between attending a public institution and possessing satisfactory knowledge ( $p = 0.01444$ ), as those attending public institutions were three times more likely to have satisfactory knowledge than those from private institutions.

Nearly a quarter of the students whose degree courses were offered in the daytime demonstrated satisfactory knowledge, while for those who studied in the evening, the percentage was 11.8%. Barely 20% of the students who failed to graduate to graduate from their disciplines demonstrated satisfactory knowledge - a result similar to that of the students who passed. Those students with a history of regular attendance during the course performed worse than those without such a history (Table 2).

Regarding the personal interest of the students, and their previous contact with the provision of initial care to burn victims, all of them considered this an important issue for professional nursing practice. As shown in Table 3, students who had performed this initial care provision were almost four times more likely to demonstrate satisfactory knowledge. The fact of having witnessed the initial treatment resulted in a nearly three times greater chance of demonstrating satisfactory knowledge.

Although the other variables in Table 3 show no significant difference, students who had a greater affinity for the initial care required by burn victims demonstrated a higher percentage of satisfactory knowledge. They reported that the matter had been discussed during graduation, and that they'd performed extracurricular activities and provided nursing care to burn patients in other situations.

## DISCUSSION

The emergency room is considered the "front" of the hospital battlefield. It is a distinctive work environment, since the health professionals who work in it are often tested with rapid and dangerous changes, and highly complex clinical and traumatic situations, that require immediate decisions to be made<sup>(15)</sup>.

Regarding the assistance of burn patients, the correct administration of initial care is extremely important to prevent the progression of burns and their associated sequelae in both the short and long terms. However, general knowledge of the appropriate initial care procedures in this area is universally poor, especially among health workers in emergency units<sup>(2)</sup>.

This fact is corroborated in this study, given the low percentage of nursing students who showed the requisite knowledge concerning

the guidelines for satisfactory initial care of burn patients. This may be associated with inadequate training of nurses in the provision of health assistance to people in critical conditions (such as patients with severe clinical instability, considering the care to burns a characteristic mark in the area under study).

The nursing students in this study shared a similar socioeconomic and demographic profile to that found in the National Survey of Student Performance (Enade) in 2010 for nursing

**Table 1.** Univariate Association between adequate knowledge and socio-demographic and economic characteristics of nursing students from four HEIs in Maringá Metropolitan Region. Maringá, PR, Brazil, 2012.

Variables	Knowledge Level				Total	OR	IC	p-value
	Satisfactory		Not Satisfactory					
	N	%	N	%				
<b>Gender</b>								
Female	22	22,7	75	77,3	97	1,2	0,2-5,9	0,83785*
Male	2	20	8	80	10			
<b>Age (96)</b>								
up to 24	12	17,6	56	82,4	68	1	3,1-0,3	0,98045
25 or older	5	17,9	23	82,1	28			
<b>Color</b>								
White	16	23,5	52	76,5	68	1,2	0,5-3,1	0,71882
Others	8	20,5	31	79,5	39			
<b>Marital Status</b>								
Single	21	23,9	67	76,1	88	1,7	0,5-6,2	0,64412*
Married	3	15,8	16	84,2	19			
<b>Income (Min. Wg.)</b>								
5 or more	14	26,9	38	73,1	52	1,7	0,7-4,1	0,27861
4 or less	10	18,2	45	81,8	55			
<b>Employment</b>								
No	18	27,3	48	72,7	66	2,2	0,8-6,0	0,12757
Yes	6	14,6	35	85,4	41			
<b>City</b>								
Maringá	19	25	57	75	76	1,7	0,6-5,1	0,31831
Outers	5	16,1	26	83,9	31			
<b>Geographic Area</b>								
Urban	23	24,5	71	75,5	94	3,9	0,6-27,5	0,31517*
Rural	1	7,7	12	92,3	13			
<b>Education Father (years)(105)</b>								
8 or more	18	23,7	58	76,3	76	1,2	0,4-3,3	0,74387
Less than 8	6	20,7	23	79,3	29			
<b>Education mother (years)</b>								
8 or more	19	25,7	55	74,3	74	1,2	0,4-3,8	0,70236
Less than 8	5	21,7	18	78,3	23			

Source: Authors' personal files.

\* Yates correction used

students, and in other Brazilian studies, which means they were predominantly young adults, female, single, with white skin color, a family income up to 4.5 times minimum wage and, to a significant extent, in employment <sup>(13,16-17)</sup>.

Although the results of this investigation indicate no statistically significant association between the extent of nursing students' knowledge and these socioeconomic and demographic variables, important differences were found for the variables concerning income and employment:

students with a higher family income, and those not in employment, performed better.

The fact that a significant proportion of the study population resorted to some kind of paid activity demonstrates their poor socioeconomic status, which leads most to reconcile study and work to ensure their maintenance and subsistence. This fact constitutes an important challenge for these students: how to combine lectures, internships and other activities related to the course with employment activities <sup>(13,17)</sup>.

**Table 2.** Univariate association of variables between satisfactory knowledge and school history of nursing students from four HEIs in Maringa Metropolitan Area. Maringa, PR, Brazil, 2012.

Variables	Satisfactory		Not Satisfactory		Total	OR	IC	p-valor
	N	%	N	%				
<b>High School</b>								
> Private school	13	29,5	31	70,5	44	2	0,8-4,9	0,1403
> Public school	11	17,5	52	82,5	63			
<b>High School Shift</b>								
> Day	23	23,7	74	76,3	97	2,8	0,4-21,5	0,55412*
> Night	1	10	9	90	10			
<b>Pre-university course</b>								
No	11	20	44	80	55	0,8	1,9-0,3	0,535444
Yes	13	25	39	75	52			
<b>Vestibular exams</b>								
Up to 3	19	20,4	74	79,6	93	0,5	1,5-0,1	0,35002*
4 or more	5	35,7	9	64,3	14			
<b>Other university course</b>								
Yes	--	--	5	100	5	0	0	0,49494*
No	24	23,5	78	76,5	102			
<b>Nursing Technician Course</b>								
Yes	4	30,8	9	69,2	13	1,6	0,5-5,8	0,67860*
No	20	21,3	74	78,7	94			
<b>Institution</b>								
Public	14	35,9	25	64,1	39	3,1	1,3-7,8	0,01444
Private	10	15,2	56	84,8	66			
<b>Shift (104)</b>								
Day	17	24,3	53	75,7	70	2,4	0,8-7,6	0,13567
Night	4	11,8	30	88,2	34			
<b>Failed in disciplines</b>								
No	14	21,9	50	78,1	64	0,9	2,3-0,4	0,86668
Yes	10	23,3	33	76,7	43			
<b>Regular attendance</b>								
Yes	21	21,4	77	78,6	98	0,5	2,3-0,1	0,68776*
No	3	33,3	6	66,7	9			

Source: Authors' personal files.

\* Yates correction used

This student-worker brings interesting experiences into the classroom - since many are already working in health-related areas - but combining professional and academic life remains a challenge for teachers and students. Furthermore, in many situations, we realize how challenging it is for that student to understand that the proposed graduation goes far beyond just a deepening of technical knowledge<sup>(18)</sup>.

In Brazil, the National Curriculum Guidelines have targeted the training of nurses in the skills and abilities required to encounter and assist with emergency epidemiological/epidemiologically-related health situations and problems, with an emphasis on the region where they live. This process of teaching and learning should be based on the identification of problems and evidence<sup>(19)</sup>.

The students' education history showed no significant association with the extent of their knowledge regarding the provision of initial care to burn victims. Students' completion of secondary education in a private school, however, did show a stronger relation to the possession of satisfactory knowledge than other variables, however nearly 60% of the students came from public schools.

Considering the importance of the student as an active subject within the teaching-learning process, their previous experiences need to be considered in the construction of theoretical and practical knowledge of nursing processes, as these experiences can enable critical insight and the application of effective action in real situations. The construction of knowledge must be grounded in a critical-pedagogical approach that emphasizes the political dimension of educational practice<sup>(18)</sup>.

**Table 3.** Univariate Association of variables between satisfactory knowledge and personal interest and previous contact with Initial care of burn victims of nursing students from four HEIs in Maringa Metropolitan Area. Maringa, PR, Brazil, 2012.

Variables	Knowledge level				Total	OR	IC	p-valor
	Satisfactory		Not Satisfactory					
	N	%	N	%				
<b>Afinity with Initial Care</b>								
A lot	13	29,5	31	70,5	44	1,2	0,4-3,4	0,72249
A few / none	8	25,8	23	74,2	31			
<b>Initial Care theoretical approach</b>								
Yes	23	22,8	78	77,2	101	1,5	0,2-13,1	0,87655*
No	1	16,7	5	83,3	6			
<b>Extracurricular Activities</b>								
Yes	12	23,5	39	76,5	51	1,1	0,5-2,8	0,7947
No	12	21,4	44	78,6	56			
<b>Performed Initial Care</b>								
Yes	12	40	18	60	30	3,6	1,4-9,1	0,00653
No	12	15,6	65	84,4	77			
<b>Witnessed Initial Care</b>								
Yes	16	45,7	35	100	35	2,7	1,1-7,0	0,03431
No	8	14,3	48	85,7	56			
<b>Treated burned patients</b>								
Yes	12	32,4	25	67,6	37	2,3	0,5-5,8	0,07133
No	12	17,1	58	82,9	70			

Source: Authors' personal files.

\* Yates correction used



Regarding the current academic status of nursing students, those belonging to public HEIs were three times more likely to possess satisfactory knowledge compared to students in private HEIs. This finding is consistent with the assessment of the Enade, wherein nursing students graduating from public institutions achieved a higher average score (53.5) in the items assessed, with performance above the national average (47.7), while the graduates from private institutions achieved an average of 46.7<sup>(16)</sup>.

Of the 691 nursing courses which participated in the Enade in 2010, 80% were at private HEIs<sup>(15)</sup>; it's safe to say that most professionals are trained through this type of institution. Therefore, it is necessary to constantly re-evaluate the quality of education offered in these institutions, in order to assure that their students begin professional lives able to perform their activities with the necessary level of quality.

The integration of theory and practice has led to a favorable outcomes where the knowledge of nursing students is concerned, and is relevant to the present study. Those students who had the opportunity to perform the procedures relating to the initial care of burn victims were almost four times more likely to possess adequate knowledge of the topic.

Different perspectives on the complexities involved in academic nursing education include the bringing together of theory and practice. Nursing practice encompasses specific propaedeutic and therapeutic activities, which determine the need for nurses with different levels of education. In this context, the academic training of nurses must include theoretical and practical teaching activities, which must be implemented in the clinical practice area<sup>(20)</sup>.

The performance of practical activities can be defined as the application of theo-

retical knowledge, which is able to generate critical thinking and improvement of skills in real situations, providing students with the opportunity to fuse action and knowledge. If well-targeted, this can led students to develop a more conscious, critical and creative way of acting<sup>(20)</sup>. Since the implementation of practical activities helps the formation of knowledge and the acquisition of skills and abilities, it is worrisome that less than a third of students have provided initial treatment to burn victims during graduation. This suggests the possibility of difficulties with autonomy and decision-making in these students' future professional lives, when faced with real situations.

Another factor showing a positive association with adequate knowledge of the procedures for initial care of burn victims was the extent to which this initial care provision had been witnessed by students, even if it wasn't performed by them. Previewing such a scenario alone made it nearly three times more likely that they'd present the satisfactory knowledge. This finding is relevant since, due to the complexity involved in this initial care and the clinical severity of these patients' cases, the students won't often have the opportunity to participate directly in the care process. However, their mere observation of the process can have a positive influence, since they will associate the situations they witnessed with the theoretical content that has previously been or will be presented.

The relevance and complexity of the subject, and its explicit link with the everyday life of nurses working in emergency units, should prompt reflection on the academic training of these professionals. The scientific knowledge learned in college can greatly contribute to the safety of the professional when faced with practical situations<sup>(20)</sup>.

## CONCLUSION

Considering that the clinical decisions of nurses come from their academic and professional experience, as well as from scientific evidence, theoretical knowledge must be used to support and improve health practices. Thus, a satisfactory academic background will bring greater safety to the care for victims of burns.

For this reason, it is disturbing that only 22.4% of students demonstrated satisfactory knowledge. From the statistical analysis used, there were associations found between satisfactory knowledge among nursing students and belonging to a public education institute, having performed nursing care relating to the initial care of burn victims, and having witnessed the initial care of burn victims.

With respect to the limitations of this study, the cross-sectional design of the research must be mentioned. However, as an initial exploratory study, this analysis achieved its objectives, demonstrating the knowledge of students concerning the provision of initial care to burn victims. The results provide support for reflection about the educational process in higher education institutions, and the unfamiliarity of the subjects of this study regarding the initial care of burn victims reveals the need for (re-)thinking teaching strategies that promote improvements related to the construction of knowledge for these scholars.

It is up to the educational institutions offering nursing courses to create the conditions in which students may acquire the requisite knowledge and skills to practice the profession, enabling future nurses to provide nursing care to patients in critical situations. It is necessary also to approach this topic in in-service education programs, in order to minimize the knowledge deficit of professionals already working in the health area.

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