

Knowledge of Undergraduate Nursing Students Regarding The Activation of Pre-hospital Emergency Services: A Cross-sectional Study

Conhecimento de Graduandos em Enfermagem Acerca do Acionamento dos Serviços de Emergência Pré-hospitalar: Estudo Transversal

Conocimiento de Estudiantes de Enfermería Sobre la Activación de Servicios de Emergencia Prehospitalaria: Estudio Transversal

RESUMO

Objetivo: Verificar se graduandos do curso de enfermagem conhecem os números para acionamento dos serviços emergenciais de atendimento pré-hospitalar. **Método:** Estudo transversal com estudantes do curso de enfermagem de uma instituição de ensino superior privada. Os participantes foram questionados quanto a qual número telefônico deveria ligar caso presenciassem alguma emergência clínica em casa ou na rua, seguido de exemplos do que seriam emergências clínicas. Os dados obtidos foram organizados e submetidos à análise estatística por meio do programa Stata: Statistical Software for Data Science. **Resultados:** Foram coletados dados de 146 estudantes do período noturno e matutino; ao serem questionados sobre o número que deveriam ligar, 94(66,2%) responderam “192”, 10(7,0%) responderam “193”, 19(13,4%) responderam “190” e 19(13,4%) outros números. **Conclusão:** Evidenciou-se que expressiva parcela dos graduandos de enfermagem desconhece ou associa erroneamente o número do SAMU (192) a outros serviços.

DESCRIPTORES: Assistência Pré-Hospitalar; Sistema Médico de Emergência; Telefone.

ABSTRACT

Objective: To assess whether undergraduate nursing students are familiar with the emergency numbers for activating pre-hospital care services. **Method:** A cross-sectional study was conducted with nursing students from a private higher education institution. Participants were surveyed regarding which telephone number they should dial if faced with a clinical emergency at home or in public, followed by examples of situations considered clinical emergencies. The data collected were organized and analyzed using Stata: Statistical Software for Data Science. **Results:** Data were obtained from 146 students enrolled in morning and evening classes. When asked which number they should dial, 94 (66.2%) responded “192,” 10 (7.0%) “193,” 19 (13.4%) “190,” and 19 (13.4%) indicated other numbers. **Conclusion:** The findings reveal that a substantial proportion of nursing undergraduates are either unaware of, or mistakenly associate, the SAMU number (192) with other services.

DESCRIPTORS: Prehospital Care; Emergency Medical System; Telephone

RESUMEN

Objetivo: Verificar si los estudiantes de enfermería de nivel de grado conocen los números telefónicos destinados a la activación de los servicios de emergencia prehospitalaria. **Método:** Estudio transversal realizado con estudiantes del curso de enfermería de una institución de educación superior privada. Los participantes fueron indagados acerca de qué número telefónico deberían marcar en caso de presenciar una emergencia clínica en el hogar o en la vía pública, seguido de ejemplos ilustrativos de dichas situaciones. Los datos recolectados fueron organizados y sometidos a análisis estadístico mediante el programa Stata: Statistical Software for Data Science. **Resultados:** Se recopilaron datos de 146 estudiantes de los turnos matutino y nocturno; al ser consultados sobre el número que debían marcar, 94 (66,2%) respondieron “192”, 10 (7,0%) respondieron “193”, 19 (13,4%) respondieron “190” y 19 (13,4%) otros números. **Conclusión:** Se constató que una proporción significativa de los estudiantes de enfermería desconoce o asocia de manera errónea el número del SAMU (192) con otros servicios.

DESCRIPTORES: Atención Prehospitalaria; Sistema Médico de Emergencia; Teléfono

RECEIVED: 09/22/2025 APPROVED: 10/08/2025

How to cite this article: Santos CGO, Baseio HG, Moretto SA, Palladino JT, Paiva LS, Camilo SO, Ichikawa CRF, Liubartas NC. Knowledge of Undergraduate Nursing Students Regarding The Activation of Pre-hospital Emergency Services: A Cross-sectional Study. *Saúde Coletiva* (Edição Brasileira) [Internet]. 2025 [acesso ano mês dia];16(101):17546-17557. Disponível em: DOI: 10.36489/saudecoletiva.2025v16i101p17546-17557

**Caio Graco Oliveira Santos**

Graduando em Enfermagem- Centro Universitário FMABC
ORCID: <https://orcid.org/0009-0002-4851-5911>

**Henrique Gabriele Baseio**

Graduando em Enfermagem- Centro Universitário FMABC
ORCID: <https://orcid.org/0009-0000-4924-9454>

**Simone Alvarez Moretto**

Enfermeira, Doutora em ciências da saúde- Centro Universitário FMABC
ORCID: <https://orcid.org/0000-0002-3085-4475>

**Juliana Thomaz Palladino**

Enfermeira, Mestre em Enfermagem na saúde do adulto- Centro Universitário FMABC
ORCID: <https://orcid.org/0009-0008-1216-3727>

**Laércio da Silva Paiva**

Fisioterapeuta, Doutor em ciências da saúde- Centro Universitário FMABC
ORCID: <https://orcid.org/0000-0003-3646-2621>

**Simone de Oliveira Camilo**

Enfermeira, Doutora em infectologia em saúde pública- Centro Universitário FMABC
ORCID: <https://orcid.org/0009-0005-1245-1233>

**Carolliny Rossi de Faria Ichikawa**

Enfermeira, Doutora em cuidado em saúde- Centro Universitário FMABC
ORCID: <https://orcid.org/0000-0003-3002-9448>

**Natália Cristina Liubartas**

Enfermeira, Mestre em ciências da saúde- Centro Universitário FMABC
ORCID: <https://orcid.org/0009-0000-9425-7832>

INTRODUCTION

Rapid response and subsequent intervention with transport for definitive treatment are essential pillars of prehospital care. In this context, the concept of "Golden Hour" emerged in 1975, emphasizing the importance of initial care in the shortest possible time, aiming to increase survival rates⁽¹⁻²⁾. This concept applies not only to traumatic cases, but also to clinical conditions, as evidenced by the significant reduction in the chance of survival for each minute lost in cardiorespiratory arrest care, or by the greater effectiveness of stroke treatment when initiated within the first hour after the event⁽³⁾.

Not knowing the correct number to call the emergency medical service can negatively impact response times. In Brazil, the numerical variation between services contributes to the increased time it takes for ambulances to arrive at the scene. The multiple

telephone numbers and overlapping responsibilities between agencies hinder public awareness, directly impacting the morbidity and mortality of victims⁽⁴⁻⁵⁾. Therefore, educating the population is essential to produce properly trained individuals, capable of activating the service quickly and judiciously⁽⁵⁻⁶⁾.

Although health education is the responsibility of all professionals, nurses occupy a prominent position, as their care practice focuses on improving care and quality of life⁽⁷⁾. Health education activities are routinely part of the work of nurses, who, upon identifying needs related to health promotion and prevention, develop and teach care practices based on the problems detected⁽⁷⁻⁸⁾. Evidence shows that individuals who have undergone recent educational interventions on activating pre-hospital services are more accurate in identifying the telephone numbers of SAMU and the Fire Department,

reinforcing the relevance of these actions⁽⁶⁻⁹⁻¹⁰⁾.

A study conducted by Luna et al.⁽¹¹⁾ across all regions of Brazil revealed that full knowledge of these numbers is still lacking. Among 438 participants evaluated, only 72.6% and 70.8% were able to correctly associate the SAMU and Fire Department numbers, respectively, which can overload control centers and compromise response to critical situations⁽⁴⁻⁵⁻¹²⁾.

Thus, health education plays a central role not only in increasing the population's knowledge of the correct numbers but also in promoting the appropriate use of services, ensuring informed and targeted activation of emergency services in situations that require immediate attention by the appropriate agency. Considering this scenario, the objective of this study is to determine whether nursing undergraduates know the numbers for activating pre-hospital emergency

services. It is assumed that these students have a greater understanding of the topic than the lay population, acting as key agents in raising community awareness and ensuring the correct use of these services.

METHOD

This was an observational, cross-sectional study conducted with nursing students, in accordance with the guidelines of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) initiative. The research was conducted at the FMABC University Center, located at Av. Lauro Gomes, 2000, in the municipality of Santo André, São Paulo, Brazil. The study was approved by the institution's Research Ethics Committee under protocol number 7,293,255 and was conducted in the first semester of 2025 with morning and evening classes from the first and fourth years of the program. The target population consisted of students regularly enrolled in the first and fourth years of the nursing program at a private higher education institution. Students actively enrolled, regularly enrolled in the morning or evening classes, were included. Students under 18 years of age and enrolled exclusively in dependent courses were excluded.

The data collection instrument consisted of a structured physical questionnaire, divided into two sections. The first, regarding participant characteristics, included sociodemographic and academic variables such as gender, age, marital status, year of study, enrollment period, and prior training in the healthcare field. The second addressed knowledge of pre-hospital emergency service call numbers, assessing identification of the correct telephone number for clinical emergencies, such as acute myocardial infarction, stroke, and cardiorespiratory arrest, in addition to investigat-

ing whether the participant had previously called an emergency service and which service was used. Data were collected in the classroom, after presentation and signature of the Informed Consent Form, completed individually and without consulting external materials.

To reduce bias in the study, all eligible students present at the time of data collection were included to minimize selection bias and ensure greater sample representativeness. To mitigate information bias, the questionnaire was pre-structured, with clear and objective questions, developed in a standardized format, and administered in person, without consulting external materials, reducing interpretation errors and external influences on responses. Furthermore, data collection was conducted under uniform conditions for all participants, with the researcher present to clarify any doubts, minimizing discrepancies in understanding the questions.

The sample size was defined as the total number of students enrolled in the first and fourth years in the first semester of 2025, totaling 146 participants. The data obtained were transcribed and tabulated in Microsoft Excel® version 2501 and analyzed using descriptive and inferential sta-

tistics in Stata® (Statistical Software for Data Science). Analyses were performed considering only valid responses (excluding non-respondents).

RESULTS

Table 1 presents the sociodemographic characteristics of the 146 participating nursing students. The number of respondents varied depending on the variable, due to non-responses. The percentages reflect only valid respondents.

The mean age was 23.32 years (± 5.94), with a predominance of females (88.36%). Regarding marital status, 83.6% were single, 11.0% were married, and 3.4% were in a stable relationship. There were no records of widowed participants. Regarding the municipality of residence, the highest concentration was observed in Santo André (43.8%) and São Bernardo do Campo (38.0%). Regarding prior training in the health field, 56.9% of participants reported no previous qualifications.

Table 1. Sociodemographic Data. Santo André, SP, Brazil, 2025

VARIÁVEIS	Total (n=146)	Morning		Night	
		1st year (n=33)	4th year (n=41)	1st year (n=52)	4th year (n=20)
AGE (YEARS)	23,32 $\pm$ 5,94	22,44 $\pm$ 4,90	23,64 $\pm$ 5,46	22,88 $\pm$ 6,35	26,85 $\pm$ 6,06
SEX					
Male	17(11,6%)	5(15,2%)	4(9,8%)	5(9,6%)	3(15,0%)
Female	129(88,3%)	28(84,8%)	37(90,2%)	47(90,4%)	17(85,0%)
MARITAL STATUS					
Single	122(83,6%)	30(90,9%)	35(85,4%)	41(78,8%)	16(80,0%)
Married	16(11,0%)	1(3,0%)	3(7,3%)	8(15,4%)	4(20,0%)
Divorced	3(2,0%)	1(3,0%)	2(4,9%)	0	0
Stable Union	5(3,4%)	1(3,0%)	1(2,4%)	3(5,8%)	0

MUNICÍPIO					
Santo André	53(43,8%)	13(43,3%)	14(41,2%)	20(51,3%)	6(33,3%)
São Bernardo	46(38,0%)	11(36,7%)	14(41,2%)	14(35,9%)	7(38,9%)
Mauá	7(5,8%)	3(10,0%)	2(5,9%)	0	2(11,1%)
São Paulo	6(5,0%)	1(3,3%)	1(2,9%)	3(7,7%)	1(5,6%)
Diadema	5(4,1%)	2(6,7%)	0	2(5,1%)	1(5,6%)
Ribeirão Pires	2(1,7%)	0	2(5,9%)	0	0
Rio Grande da Serra	1(0,8%)	0	0	0	1(5,6%)
São Caetano do Sul	1(0,8%)	0	1(2,9%)	0	0
TRAINING IN THE HEALTH FIELD					
No	82(56,9%)	18(54,5%)	31(79,5%)	23(44,2%)	10(50,0%)
Nursing technician	53 (36,8%)	13(39,4%)	6(15,4%)	25(48,1%)	9(45,0%)
Nursing Assistant	4 (2,8%)	1(3,0%)	2(5,1%)	0	1(5,0%)
Other training	5 (3,5%)	1(3,0%)	0	4(7,7%)	0

aSome denominators vary due to incomplete

data; Mean $\pm$ Standard Deviation;

Frequency (percentage); HEALTH EDUCATION (previous training in a healthcare field)

Source: Prepared by the author.

As shown in Table 2, 66.2% of students correctly identified the number 192 for clinical emergencies, while 13.4% indicated the number 190,

7.0% the number 193, and 13.4% mentioned other numbers. In the overall analysis, first-year students had a lower proportion of errors compared to fourth-year students ($p = 0.029$), evidencing a significant association between year of study and the occurrence of errors. No associations

were observed between errors and the variables gender, shift, marital status, municipality of residence, or prior health training. In the isolated analysis, "year of study" and "shift" also showed no significant association with the occurrence of errors ($p = 1.000$ and $p = 0.198$, respectively).

Table 2. Emergency number for clinical emergencies. Santo André, SP, Brazil, 2025

NUMBER	Total (n=142)	Morning		Night	
		1st year (n=33)	4th year (n=41)	1st year (n=52)	4th year (n=20)
192	94(66,2%)	21(65,6%)	23(56,1%)	40(78,4%)	10(55,5%)
190	19(13,4%)	6(18,7%)	5(12,2%)	3(5,9%)	5(27,8%)
193	10(7,0%)	1(3,1%)	7(17,1%)	0	2(11,1%)
Others	19(13,4%)	4(12,5%)	6(14,6%)	8(15,7%)	1(5,5%)

Frequency (percentage); ^b Total sample = 146; for this variable, N = 142 due to non-responses.
Source: Prepared by the authors.

DISCUSSION

This study aimed to assess nursing undergraduates' knowledge of the emergency number for pre-hospital emergency services. The findings showed that, although most participants correctly identified the number for the Mobile Emergency Care Service (SAMU – 192), a significant pro-

portion of students remained unsure or mistakenly associated the number with other services, such as the Fire Department (193) or the Military Police (190).

This gap is concerning given the central role of nurses in health education and the initial response to urgent and emergency situations. Lack of knowledge or confusion regarding the emergency number can delay care, negatively impacting response times and, consequently, clinical outcomes⁽¹³⁾.

Similar results were reported by Luna et al. (2024)⁽¹¹⁾ when investigating the Brazilian population's knowledge of emergency numbering. The study found that, although 72.6% of participants correctly associated 192 with SAMU, there was a recurring pattern of confusion between the services, particularly the interchangeability of the SAMU and Fire Department numbers. This evidence suggests that overlapping perceptions of the responsibilities of these services compromise

the effectiveness of responses in critical situations.

Unexpectedly, data stratification revealed that first-year students had a lower proportion of errors compared to fourth-year students ($p = 0.029$). This result contradicts the hypothesis that advancement in academic training is associated with improved practical knowledge related to the health system, especially regarding emergency service activation.

This finding converges with the investigation by Fernandes et al. (2014)⁽¹⁴⁾, which evaluated medical students and found an accuracy rate of 83.6% for the SAMU number, with no significant differences between the basic and clinical cycles. Both the results of this study and those of Fernandes et al. indicate that progression in academic training does not guarantee greater mastery of essential information for working

in emergency settings, reinforcing the need for specific pedagogical strategies to consolidate this knowledge throughout the course.

The findings reinforce the importance of including, from the first semesters of the undergraduate program, theoretical and practical content focused on education in emergency care, including knowledge about the channels for activating pre-hospital services. Pedagogical strategies such as realistic simulations, workshops, and educational campaigns can help consolidate this knowledge, increasing the safety and effectiveness of future nurses' work in critical situations.

Among the limitations is the cross-sectional design, which does not allow for establishing causal relationships between the year of graduation and the level of knowledge observed. Furthermore, the data were collected

at a single institution, which may limit the generalizability of the results to other academic and regional contexts. Multicenter studies with greater population representation are recommended to deepen the understanding of this phenomenon.

CONCLUSION

It is concluded that a significant portion of nursing undergraduates are unaware of or incorrectly associate the SAMU (192) number with other emergency services. This finding reveals a gap in the educational process, indicating the need for educational strategies that ensure the assimilation of this essential knowledge. It is recommended that future research explore pedagogical interventions capable of expanding students' understanding of the channels for activating prehospital services.

REFERENCES

1. Hsieh SL, Hsiao CH, Chiang WC, Shin SD, Jamaluddin SF, Son DN, et al. Association between the time to definitive care and trauma patient outcomes: every minute in the golden hour matters. *Eur J Trauma Emerg Surg.* 2022; 48:2709-16.
2. National Association of Emergency Medical Technicians (NAEMT). *Prehospital Trauma Life Support*. 10th ed. Burlington (MA): Jones & Bartlett Learning; 2023.
3. Di Biase L, Bonura A, Caminiti ML, Pecoraro PM, Di Lazzaro V. Neurophysiology tools to lower the stroke onset to treatment time during the golden hour: microwaves, bioelectrical impedance and near infrared spectroscopy. *Ann Med.* 2022; 54:264659.
4. Soleimanian M, Bijani M, Nikrouz L, Naghizadeh MM, Ranjbar K, Heidari G. A timeliness analysis of emergency services and cardiovascular outcomes in cardiac patients referred through prehospital emergency services between 2020 and 2023: a cross-sectional study in Iran. *BMC Res Notes.* 2024; 17:250. doi:10.1186/s13104-024-06922-5
5. Lima BDS, Matos ABOV, Rabito LBF, Gonçalves TLP, Flávio GG, Leal ES. Análise dos fatores que interferem no tempo resposta nas diferentes etapas do atendimento do SAMU. *Rev Bras Med Emerg.* 2022;3. doi:10.5935/2764-1449.20220014.
6. Faleiros IB. Capacitação em primeiros socorros para professores e funcionários do ensino fundamental e médio. *Rev Pesqui Cuid Fundam Online.* 2021;13.
7. Costa DA. Enfermagem e educação em saúde. *Rev Cient Esc Est Saúde Pública Goiás Cândido Santiago.* 2020.
8. Ferreira Júnior AM. Percepção de acadêmicos de enfermagem sobre educação em saúde na perspectiva da qualificação do cuidado. *Rev Eletrônica Acervo Saúde.* 2020;12.
9. Libório MR, Mendes Junior ES. Avaliação do conhecimento em primeiros socorros de estudantes de medicina em uma instituição de ensino superior da Bahia, Brasil. *Rev Eletrônica Acervo Saúde.* 2025;25(5):e19950.doi:10.25248/REAS.e19950.2025
10. Brito JG, Oliveira IP, Godoy CB, França APSJM. Effect of first aid training on teams from special education schools. *Rev Bras Enferm.* 2020;73. doi:10.1590/0034-7167-2018-0288.
11. Luna AA, Bica RB, Santos CHA. Reconhecimento dos números de emergência (190, 192 e 193) pela população brasileira. *Rev Contexto Saúde.* 2024;24:e14835.
12. Conceição DS, Viana VSS, Batista AKR, Alcântara ASS, Eleres VM, Pinheiro WF, et al. A educação em saúde como instrumento de mudança social. *Braz J Dev.* 2020; 6:59412-6.
13. Pimenta da Silva Machado D, Sampaio da Costa S, Souza AC, Neres LS, Cavilha PA, Zukowsky-Tavares C, et al. Conhecimento sobre primeiros socorros entre adolescentes no ensino médio em escolas públicas: estudo transversal. *Docent Discunt.* 2024;5:e01588. doi:10.19141/2763-5163.docentdiscunt.v4.n1.pe01588
14. Cavalcante RFSB, Pinheiro JA, Costa JVG, Costa PLR, Melo-Filho AA. Knowledge of medical students about the functioning of the Mobile Emergency Medical Service (SAMU). 2014.

NÚMERO DA FICHA: _____

INSTRUMENTO DE COLETA DE DADOS

Data: ____/____/____

RA: _____

Data de nascimento: ____/____/____

Idade: _____ anos

Sexo: ☐ Feminino ☐ Masculino Município de residência _____Estado civil: ☐ Solteiro ☐ Casado ☐ Divorciado ☐ Viúvo ☐ União estávelAno do curso: ☐ 1° ☐ 2° ☐ 3° ☐ 4°Período: ☐ Matutino ☐ Noturno

Você tem alguma formação na área de saúde?

☐ Sim ☐ Não

Se sim, qual? _____

1. Qual o número de telefone que você deve ligar caso presencie alguma emergência clínica em casa ou na rua? (São exemplos de emergência clínica situações como: dor no peito, desmaios e convulsões).

Resposta _____

2. Você já acionou algum serviço de emergência pré-hospitalar pelo telefone?

☐ Sim ☐ Não

3. Caso sua resposta na pergunta acima seja positiva, qual serviço você já acionou?
