

Assessment of Medical Students' Knowledge for Polytrauma Cases in Romania: A Cross-sectional Study

Octavian Andronic¹, Vlad Buica^{1*}, Andreea-Delia Panaete¹, Dan Nicolae Păduraru¹, Alexandra Bolocan¹, Daniel Ion¹, Florentina Mușat¹, Daniel Preda², Suzana Măceș², Stelian Pantea³, Cătălin Pîrvu³, Cristian Nica³, Alin Mihai Vasilescu⁴, Costel Bradea⁴, Călin Molnar⁵, Adrian Tudor⁵, Vlad Olimpiu Butiurcă⁵, Marian Botoncea⁵, Cătălin Cosma⁵, Valeriu Șurlin²

¹University of Medicine and Pharmacy Carol Davila, Bucharest, Romania

²University of Medicine and Pharmacy of Craiova, Romania

³Victor Babes University of Medicine and Pharmacy Timisoara, Romania

⁴Grigore T. Popa University of Medicine and Pharmacy, Iasi, Romania

⁵University of Medicine, Pharmacy, Sciences and Technology of Targu Mures, Romania

*Corresponding author:

Vlad Buica, MD
University of Medicine and Pharmacy
Carol Davila, Bucharest, Romania
Eroii Sanitari Boulevard, number 8,
050474, Bucharest, Romania
E-mail: vlad.buica0720@stud.umfcd.ro

Rezumat

Evaluarea cunoștințelor studenților la medicină privind cazurile de politraumă în România: un studiu transversal

Context: Politrauma reprezintă o cauză majoră de morbiditate și mortalitate, însă metodele de formare în managementul acesteia lipsesc adesea din programele de studii universitare de medicină. Acest studiu a vizat evaluarea cunoștințelor și percepțiilor studenților la medicină din România cu privire la managementul politraumei și evaluarea necesității introducerii unor cursuri dedicate în curriculum.

Metode: A fost realizat un studiu transversal în rândul studenților la medicină din șapte universități importante din România. Chestionarul a inclus date demografice, cunoștințe despre politraumă, abilități legate de primul ajutor și percepții privind introducerea cursurilor de politraumă. Studiul s-a desfășurat în mai multe universități de medicină de prestigiu din România, inclusiv București, Craiova, Timișoara, Iași, Cluj-Napoca, Târgu Mureș și Sibiu. În total, 413 studenți au participat la sondaj, fiind recrutați prin intermediul platformelor online și prin interacțiune directă. Toți participanții au completat chestionarul în mod voluntar.

Rezultate: Dintre toți participanții, 78,7% au auzit despre politraumă în principal prin rotațiile clinice de Chirurgie Generală, Medicină de Urgență și Ortopedie. Cu toate acestea, doar 31% dintre participanții care au auzit despre politraumă au definit-o corect. Nu s-a găsit nicio corelație între încrederea în acordarea primului ajutor și cunoștințele reale ($p=0,097$). Aproape 80% au considerat că managementul politraumei ar trebui să fie o materie obligatorie în curriculum.

Concluzie: Studiul evidențiază o lacună semnificativă în educația medicală din România în ceea ce privește abilitățile de management al politraumei în rândul studenților. Acesta susține introducerea unor cursuri obligatorii de

Received: 15.09.2025

Accepted: 18.11.2025

îngrijire a traumei pentru a îmbunătăți abilitățile practice și retenția cunoștințelor în rândul viitorilor profesioniști din domeniul sănătății.

Cuvinte cheie: politraumă, ATLS, medicină de urgență, primul ajutor

Abstract

Background: Polytrauma is a major cause of morbidity and mortality, yet formal training in its management is often absent from undergraduate medical curricula. This study aimed to assess the knowledge and perceptions of Romanian medical students regarding polytrauma management and evaluate the need for dedicated curricular courses.

Methods: A cross-sectional survey was conducted among medical students from seven major universities in Romania. The questionnaire included demographic data, knowledge about polytrauma, skills related to first aid, and perceptions on introducing polytrauma courses. The study took place at several prominent medical universities across Romania, including Bucharest, Craiova, Timișoara, Iași, Cluj-Napoca, Târgu Mureș, and Sibiu. Overall, 413 students participated in the survey and were recruited through online platforms and direct interaction. All participants completed the survey voluntarily.

Results: Of all the participants, 78.7% had heard about polytrauma primarily through clinical rotations in General Surgery, Emergency Medicine, and Orthopedics. However, only 31% of the participants who heard about polytrauma accurately defined it. No correlation was found between confidence in providing first aid and actual knowledge ($p=0.097$). Almost 80% believed that polytrauma management should be a mandatory subject in the curriculum.

Conclusion: The study highlights a significant gap in Romanian medical education regarding polytrauma management skills among students. It supports the introduction of mandatory courses on trauma care to enhance practical skills and knowledge retention among future healthcare professionals.

Keywords: polytrauma, ATLS, emergency medicine, first aid

Introduction

Trauma represents a significant public health challenge, contributing to substantial mortality and disability every year, and profoundly impacting the quality of life through physical and emotional repercussions. Polytrauma is characterised by the presence of at least two injuries in the same incident, with one of them being life-threatening (1,2). Advanced Trauma Life Support (ATLS) was originally developed for emergency situations in rural areas, where the medical personnel may be limited. Today, it is widely recognized as the standard of care for the first (golden) hour in trauma worldwide (3).

ATLS was initiated in 1978 by Dr. James Styner after surviving a tragic plane crash with his family. Reflecting on the experience, he famously stated, "When I can provide better care in the field with limited resources [...], there is something wrong with the system, and the system has to be changed." More than 40 years later, his vision has evolved into a globally recognized training program, with over 80 countries adopting the ATLS

course - an intensive two-and-a-half-day module based on interactive learning and instructional techniques (4).

The mortality rate in Romania due to road traffic accidents exceeds 9.9 per 100 000 inhabitants, although it has decreased from 14.4 in 2008 (5). Despite the decline, the prevalence of road traffic accidents means that such events are still likely to be witnessed. For example, a report from the European Commission published in March 2025 stated that Romania held the highest road fatality rate in the EU, with 77 deaths per million inhabitants. This was significantly higher than the EU average of 44 deaths per million (6). In this context, medical students should be equipped with the necessary knowledge to provide accurate first aid and perform effective triage, optimizing the response of emergency services. Also, there is a significant gap in the preparation of students in this area. As of 2024, the Ministry of Health of Romania offered 24 positions for emergency medicine in Bucharest within the Residency Programme (7). A minimum of ten institutions in Bucharest are designated as Emergency Hospitals,

where it is essential for all the physicians to possess expertise in administering first aid in emergency situations (8). As future doctors, it is important for them to begin their training early, to acquire essential skills, including both international protocols and specific procedures and techniques.

Our study aims to assess the extent of this gap in Romanian medical education, and its significance and also to suggest future directions focused on the practical part.

Materials and Methods

This research was conducted as a cross-sectional study between February and April 2024. The survey instrument was a questionnaire developed specifically for this study by the research team. The questionnaire was not a pre-existing, validated tool but was meticulously crafted to address the primary objectives of the study: assessing the knowledge, first aid skills, and perceptions of medical students regarding polytrauma, and the role of first aid training in their curriculum. The questionnaire comprised 24 questions, including 19 open-ended and 5 closed-ended questions, which are detailed in *Appendix A*.

To ensure the relevance and clarity of the questions, the survey was pre-tested with a small, purposive sample of 10 medical students not included in the final study population. This preliminary testing helped refine question wording and formatting, ensuring that the questions were clear, unambiguous, and effectively captured the intended data. The survey inquired about demographic data (age, gender, year of study, and university center), knowledge of polytrauma, skills related to first aid, and opinions on integrating first aid courses into the university curriculum.

The study sample consisted of 413 students from medical faculties across Romania, representing a broad spectrum of the country's most significant university centers: Carol Davila University of Medicine and Pharmacy, Iuliu Hașeganu University of Medicine and Pharmacy, Grigore T. Popa University of Medicine and Pharmacy, Victor Babeș University of Medicine and Pharmacy, and others. The recruitment strategy aimed to capture a large and diverse group of participants from all years of study. Participants were recruited through online channels, including social media platforms, university email lists, and direct communication with student representatives. Data collection was managed using an online questionnaire distributed via Google Forms.

Statistical Analysis

Collected data were analyzed using statistical methods for quantitative data. Statistical analysis was performed using JASP software (version 0.19.1.0) and Microsoft Excel 2021. Both open-ended and closed-ended responses were coded and analyzed to identify key themes and patterns. Descriptive statistics were used to summarize demographic information and core variables, while inferential statistics were employed to explore relationships between variables, such as the correlation between knowledge scores and year of study.

Among the questions posed to participants, a set assessing their knowledge of polytrauma was included and is displayed in *Table 1*.

Ethics Approval

The study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. We obtained the consent of the Ethics Committee of Scientific Research of the University of Medicine and Pharmacy Carol Davila No. 9207. All our participants involved in the study were informed and gave their consent related to the General Data Protection Regulation (GDPR) before completing the survey. Furthermore, anonymity and confidentiality of responses were ensured, and participation in the study was entirely voluntary, free from any risks or pressures on participants.

Results

A total number of 413 individuals completed our survey in the process of data collection. The respondents' age varied between 18 and 35 with a mean value of approximately 22.5 and a median value

Table 1. Questions evaluating the knowledge of participants

No.	Question
1	What is the most frequent cause of polytrauma?
2	What is considered the optimal time interval for saving a victim?
3	What is the abbreviation of the protocol used in the Primary Assessment of a victim?
4	In the case of an airways obstruction and an incapacity of removing the foreign body, what do you do in an unconscious patient?
5	Which of the following conditions is considered life-threatening for the patient?
6	Which stage of the Primary Assessment includes the following Score from the image?

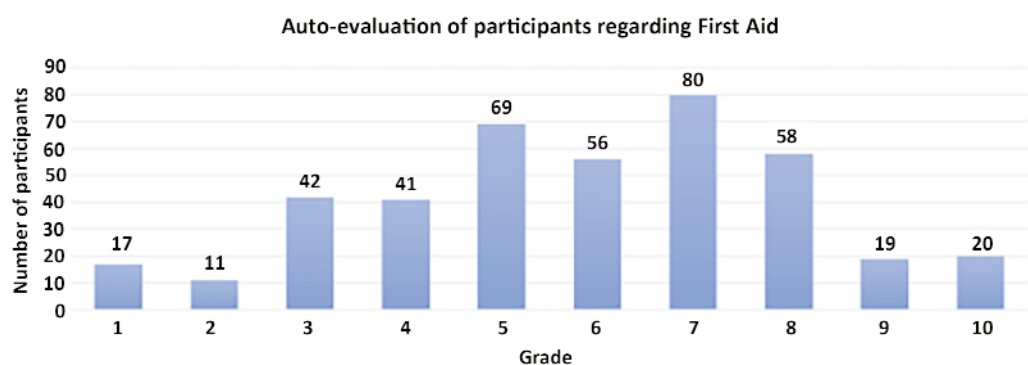


Figure 1. "On a scale from 1 to 10, how prepared do you think you are to offer first aid in case of emergency?"

of 22. Of the participants, 87.5% (n=361) were between 21 and 24 years old. Furthermore, among our participants, 70.2% were females (n=290) and 29.3% were males (n=121). Participants from all academic years of the university were included, with the majority being in their fourth year (n=264).

At the start of the survey, the respondents were asked to rate their capability in providing first aid during emergencies on a scale from 1 to 10, which was illustrated in Fig. 1. Then, the participants were divided into Group A, consisting of individuals who had heard about polytrauma (n=325), and Group B, comprising individuals without such knowledge (n=88) through the question "Have you ever heard about the concept of polytrauma?"

Group A consisted of 78.7% of our participants (n=325) which admitted to having heard about polytrauma and moved further to the assessment part of the questionnaire. Participants in Group B were not assessed for their knowledge of polytrauma and proceeded directly to questions regarding the potential incorporation of these courses into the

university curriculum (Fig. 2).

The following questions were addressed only to the participants from Group A. At the request of a definition for the concept of polytrauma ("Present in a few words the concept of polytrauma") and the answer must have included: "multiple traumatic injuries affecting at least 2 organ systems" and "at least one of the injuries posing a threat to life", only 31.38% of the students from Group A (n=102) gave a complete and proper context.

The various approaches through which participants gathered information about polytrauma are listed in Fig. 3. Important subjects in the curriculum of the University which addressed this concept are General Surgery (n=86), First Aid (n=66), Emergency medicine (n=67), and Orthopedics (n=46).

The questionnaire included 3 single-choice (questions no.1, no. 4, and no. 6 from Table 1), 2 multiple-choice questions (questions no. 2 and no. 5 from Table 1), and 1 open-ended question (no. 3 from Table 1). The percentages of correct answers are listed in Table 2. We can observe that the participants handled the single-choice questions

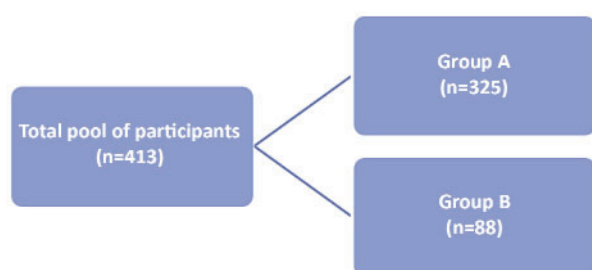


Figure 2. The total pool of participants was divided into two groups: Group A, which consisted of individuals who had heard about polytrauma, and Group B.

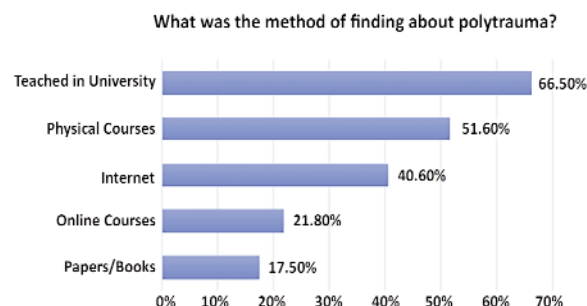


Figure 3. "Mention all the ways in which you found about polytrauma"

Table 2. Evaluation of the answers of the participants from group A

Question no.	Number of correct answers	Percentage of correct answers
1	323	99.38%
2	31	9.5%
3	147	45.23%
4	207	63.7%
5	50	15.38%
6	246	75.7%

better, while in questions no. 2 and no. 5 the percentages fall under 16%. The average percentage from the evaluation remains at 51.48%.

We defined a new group A0 by selecting the students from group A who evaluated themselves with a score equal to or higher than 7 on the question “On a scale from 1 to 10, how prepared do you think you are to offer first aid in case of emergency?” (Fig. 4)

We assessed two variables of the group A0: auto-evaluation score over or equal to 7 at the question “On a scale from 1 to 10, how prepared do you think you are to offer first aid in case of emergency?” and an evaluation score ≥ 4 at the 6 questions evaluating the knowledge of the participants presented in the methods and materials section. The purpose was to assess the confidence of participants correlated to their knowledge about polytrauma. We performed a Chi-square test where we compared the two variables presented and no significant correlation was discovered ($p=0.097$).

The final section of the survey was addressed to all our participants ($n=413$) and explores students’ perspectives on the possibility of introducing polytrauma courses in University curriculum. Of

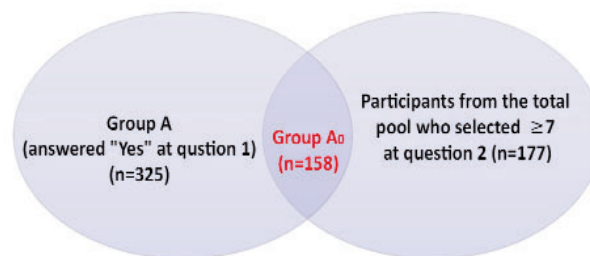


Figure 4. Question 1: “Have you ever heard about the concept of polytrauma?”
Question 2: “On a scale from 1 to 10, how prepared do you think you are to offer first aid in case of emergency?”

the participants, 70.2% ($n=290$) reported that polytrauma intervention techniques were at least mentioned during their university education in different clinical rotations. However, when asked to rate the importance of these courses on a Likert scale from 1 to 10, 94.1% ($n=389$) rated it above 8, and no students assigned a score below 5. All 413 participants agreed that polytrauma should be included in the curriculum, with 79.9% ($n=330$) believing it should be a mandatory subject as shown in Fig. 5, with the first (29.3% $n=121$) and fourth (29.8% $n=123$) year to be considered the most suitable.

In the following paragraph, we present the correlations between the stage of medical education and students’ attitudes, knowledge, or training related to polytrauma. For the purpose of analysis, respondents were divided into two groups: pre-clinical students (years 1-3 of study) and clinical students (years 4-6). A chi-square test showed a statistically significant association between year of study and the attitude adopted when witnessing a road traffic accident ($\chi^2 = 8.345$, $df = 3$, $p = 0.039$),

Table 3. Association between year of study and the attitude adopted when witnessing a road traffic accident

Year of Study	If you witness a road accident with victims, what attitude will you have?				Total
	I will call 112 without getting involved	I will sort patients and give first aid until the arrival of the ambulance	I will leave it to others who are more determined to help the victims	I will continue on my way without doing anything	
Clinical	60	270	20	0	350
Preclinical	16	42	4	1	63
Total	76	312	24	1	413

Chi-Squared Test

	Value	df	p
χ^2	8.345	3	0.039
N	413		

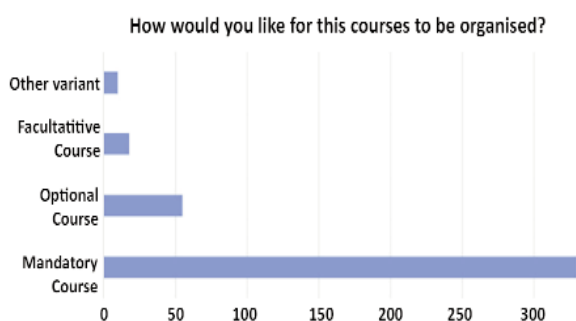


Figure 5. Students' perspective regarding the method of introducing polytrauma courses in the curriculum

with clinical students being more likely to provide first aid compared to preclinical students (*Table 3*).

Awareness of the ATLS concept also differed markedly between the two groups, demonstrating a strong association ($\chi^2 = 34.509$, $df = 1$, $p < 0.001$), as clinical students reported greater familiarity (*Table 4*).

Furthermore, exposure to university-taught first-aid concepts in the context of polytrauma was significantly higher among clinical students, as confirmed by another chi-square test ($\chi^2 = 36.681$, $df = 1$, $p < 0.001$). The results are presented in *Table 5*.

Discussions

Trauma can result from a multitude of sources, such as vehicular collisions, falls, and natural disasters, each of which can exert significant and lasting impacts on individuals affected by these events. These incidents represent a leading cause of death among individuals under the age of 44 (9). Even for survivors, the consequences often extend to significant challenges in daily life. As such, the management and treatment of trauma patients should be a central priority for healthcare professionals. In response, more developed nations have dedicated substantial financial and human resources to address these critical issues (9).

Romania is a medium-sized, moderately populated country with a population of around 19 million, characterized by significant regional disparities in urbanization and topographical diversity with approximately 2.6 hospitals per 100 000 inhabitants, compared to Switzerland which has 3.8 and possesses one of the best medical systems in the world (number 1 in 2024 World Index of Healthcare Innovation) (10,11).

Table 4. Association between year of study and awareness of the ATLS concept

Year of Study	Have you ever heard of the concept of polytrauma (ATLS - Advanced Trauma Life Support)?		Total
	Yes	No	
Clinical	293	57	350
Preclinical	32	31	63
Total	325	88	413

Chi-Squared Test

	Value	df	p
χ^2	34.509	1	< .001
N	413		

Table 5. Association between year of study and exposure to university-taught first-aid concepts in the context of polytrauma

Year of Study	Were concepts regarding first aid in case of polytrauma addressed in the University?		Total
	Yes	No	
Clinical	84	266	350
Preclinical	39	24	63
Total	123	290	413

Chi-Squared Test

	Value	df	p
χ^2	36.681	1	< .001
N	413		

Reorganizing trauma care systems has led to notable reductions in mortality rates. For instance, Royal London Hospital reported a decrease from 34.2% to 17.5% during 2000-2005 (12). In comparison, the Emergency Hospital of Bucharest reports a significantly higher rate of mortality of 30.5%, highlighting the potential for improvement (9). These findings underscore the critical role of systemic restructuring in reducing trauma-related fatalities.

Trauma training in low- and middle-income countries has been emphasized as crucial, especially in resource-limited settings. While adhering to the ATLS model as the gold standard (13), these countries sought more cost-effective alternatives to suit their financial constraints. This approach allowed for the implementation of effective trauma care training without compromising quality, ensuring broader access to essential medical education (14).

When assessing the impact of ATLS courses, one study used The Objective Structured Clinical Examination (OSCE) methodology, which is

considered one of the most reliable instruments used in evaluating clinical competence in health sciences education (15). It highlighted the improvements brought to the emergency care with the implementation of ATLS courses in Trinidad and Tobago. All participants in the ATLS group attained the 80% pass mark set by the American College of Surgeons ATLS Subcommittee. In contrast, the non-ATLS group failed to meet this standard, despite showing a modest improvement in their MCQ scores on the second test (16). The effectiveness of the ATLS program in enhancing trauma management skills was evaluated shortly after participants completed the course. While the study did not address long-term retention, previous research indicates that skills and knowledge acquired through ATLS diminish over time (17).

Over time, the effectiveness of ATLS training not only enhances student performance but also improves the quality of instruction. A five-year study conducted in Germany demonstrated that teaching proficiency significantly increased within the first 100 events held (18). These improvements associated with individual ATLS trainer courses, which are considered beneficial by the participants (19), reflect the robust training framework of the programs, which benefits both learners and educators.

This study represents the first multicentric research of its kind in Romania, focusing on the topic of polytrauma, which is addressed at various stages within medical curricula at various universities. According to participant responses, 66.5% learned about this subject through university courses. However, approximately 31% of participants from group A is aware of the true definition of polytrauma. Furthermore, while many participants expressed confidence in their ability to provide first aid, the average accuracy rate of their responses was only 51%. Notably, no correlation could be established between participants' confidence in their skills and the correctness of their answers during the evaluation. In a systematic review which evaluated the educational and clinical impact of ATLS courses, the authors stated that abilities gathered during the training start to fade after only 6 months with a maximum decline at 6 years (level II-1 evidence). Nevertheless, the ability to prioritize victims presenting with the most severe conditions to the trauma centre is retained for an extended duration, typically around eight years (3). The information presented in our study correlated with the scientific literature, highlighting the

urgent need for the introduction of refresher courses that should be repeated at regular intervals. We propose that these courses be conducted every two years to enhance knowledge retention and practical skills.

Regarding the correlations between the stage of medical education and students' attitudes, knowledge, or training related to polytrauma (Tables 3-5), clinical students from our study showed greater willingness to provide first aid, higher familiarity with ATLS, and more exposure to polytrauma-related teaching, reflecting the increased hands-on training and real patient contact characteristic of the later years of study. This pattern aligns with the literature, which consistently shows that clinical experience and structured trauma education improve confidence, knowledge, and decision-making in emergency settings (20). The lower readiness seen in preclinical students suggests an opportunity to introduce trauma-related skills earlier in the curriculum to reduce this gap. Overall, the results emphasize the importance of progressive, practice-oriented training in shaping competent future responders to trauma scenarios.

Assessing the situation in Greece, a specialised 2-day ATLS course for students was organised in the span of 3 years and the findings were published: 96% of participants had more confidence in giving first aid and 58% believed that they can offer better medical services (21). This study led to the implementation of ATLS courses in more Medical Universities across Greece.

Based on the research conducted, there is a need for the introduction of ATLS as a mandatory course in the curriculum of the Universities in Romania. Furthermore, more emphasis should be put on the practical application of the knowledge gained during lectures. A revision of the information gathered should also be performed as our study pointed out the dissociation between the confidence of participants in their knowledge and their objective assessment.

Limitations of the Study

Although this study represents the first multicenter investigation conducted in Romania to assess knowledge of polytrauma among students, the sample size should have been larger to enhance the relevance and significance of the findings. Additionally, the distribution of participants across different centres was unequal due to difficulties in disseminating the questionnaire. Expanding the

range of questions employed in the evaluation could yield a more comprehensive understanding of the participants' knowledge and attitudes. Moreover, the practical aspects of ATLS could not be assessed, as all questions focused solely on the theoretical component.

Conclusion

In conclusion, the results of our cross-sectional study underline the need to improve the education of medical students regarding polytrauma management in Romania. Despite the importance of this area in the broader context of trauma care, our findings reveal significant gaps in both knowledge and confidence among future health-care professionals. While a substantial majority of students reported having encountered polytrauma in their curricula, only a fraction demonstrated a comprehensive understanding of its definition and management, as evidenced by the average accuracy rate of their responses. The integration of structured, practical training modules, such as ATLS program, into the university curriculum has the potential to elevate the management skills of future residents in an emergency setting. Just as the model adopted in Greece, we encourage further research into the effectiveness of proposed educational strategies, as well as the initiation of a more collaborative framework among Romanian medical institutions to make trauma-related training more accessible for students.

Author's Contributions

O.A., D.P., D.I., V.Ș. - study concept and design. V.B., A.-D.P. - acquisition of the data. A.B., F.M., D.P., Ș.P. - analysis and interpretation of the data. C.P., C.N., A.V. - drafting of the manuscript. C.B., C.M., A.T. - critical revision of the manuscript for important intellectual content. V.O.B., M.B., C.C. - statistical expertise.

Conflicts of Interest

The authors report no conflict of interest.

Funding

There is no funding to be declared.

References

- Jaramillo CA, Tapia RN, Eapen BC. Polytrauma Rehabilitation. In: Essentials of Physical Medicine and Rehabilitation: Musculoskeletal Disorders, Pain, and Rehabilitation. 4th ed. Philadelphia: Elsevier; 2020. p. 828-33.
- Nauth A, Hildebrand F, Vallier H, Moore T, Leenen L, McKinley T, et al. Polytrauma: update on basic science and clinical evidence. *OTA Int.* 2021;4(1):e116.
- Mohammad A, Branicki F, Abu-Zidan FM. Educational and clinical impact of Advanced Trauma Life Support (ATLS) courses: a systematic review. *World J Surg.* 2014;38(2):322-9.
- ATLS Subcommittee; American College of Surgeons' Committee on Trauma; International ATLS working group. Advanced trauma life support (ATLS®): the ninth edition. *J Trauma Acute Care Surg.* 2013;74(5):1363-6.
- World Health Organization. WHO Mortality Database. Geneva: WHO; 2024.
- Romania Insider. Romania still tops EU road fatality statistics despite decline, EC report says. 2025.
- Ministerul Sănătății. Rezidentiat.ms.ro - site oficial al concursurilor de rezidentiat. Bucharest: MS; 2025.
- Leges.ro. Lista spitalelor grupate pe tipuri de spitale I Ordin 1567/2007. 2025.
- Stoica B, Paun S, Tanase I, Negoii I, Beuran M. Trauma pattern in a level I east-European trauma center. *J Acute Dis.* 2015;4(4):322-6.
- Heim C, Bosio F, Roth A, Bloch J, Borens O, Daniel RT, et al. Is trauma in Switzerland any different? epidemiology and patterns of injury in major trauma - a 5-year review from a Swiss trauma centre. *Swiss Med Wkly.* 2014;144:w13958.
- FREOPP. World Index of Healthcare Innovation. 2025.
- Davenport RA, Tai N, West A, Bouamra O, Aylwin C, Woodford M, et al. A major trauma centre is a specialty hospital not a hospital of specialties. *Br J Surg.* 2009;97(1):109-17.
- Choi J, Carlos G, Nassar AK, Knowlton LM, Spain DA. The impact of trauma systems on patient outcomes. *Curr Probl Surg.* 2020;58(1):100849.
- Brown HA, Tidwell C, Prest P. Trauma training in low- and middle-income countries: A scoping review of ATLS alternatives. *Afr J Emerg Med.* 2022; 12(1):53-60.
- van der Vleuten CPM, Swanson DB. Assessment of clinical skills with standardized patients: State of the art. *Teach Learn Med.* 1990;2(2):58-76.
- Ali J, Cohen R, Adam R, Gana TJ, Pierre I, Bedaysie H, et al. Teaching effectiveness of the advanced trauma life support program as demonstrated by an objective structured clinical examination for practicing physicians. *World J Surg.* 1996;20(8):1121-5; discussion 1125-6.
- Ali J, Cohen R, Adam R, Gana TJ, Pierre I, Ali E, et al. Attrition of cognitive and trauma management skills after the Advanced Trauma Life Support (ATLS) course. *J Trauma.* 1996; 40(6):860-6.
- Luedi MM, Wölfl CC, Wieferich K, Dogjani A, Kauf P, Doll D. Teaching Advanced Trauma Life Support (ATLS): A nationwide retrospective analysis of 8202 lessons taught in Germany. *J Surg Educ.* 2017;74(1):161-6.
- Moss GD. Advanced Trauma Life Support instructor training in the UK: an evaluation. *Postgrad Med J.* 1998;74(870):220-4.
- Ali J, Cohen RJ, Gana TJ, Al-Bedah KF. Effect of the Advanced Trauma Life Support program on medical students' performance in simulated trauma patient management. *J Trauma.* 1998;44(4):588-91.
- Vassiliu P, Mavrogenis A, Theos C, Koulouvaris P, Massalis I, Geranios A, et al. Advanced trauma life support course for medical students. A new era? *Front Surg.* 2022;9:1025920.

Supplementary Material

Appendix A. The questions present in the questionnaire

Section 1. Demographic Information

- Age (Numeric question with open-ended response, 18-99)
- Gender (Single choice question, Female/Male/Prefer not to say)
- University training center (Single choice question: "Carol Davila" University of Medicine and Pharmacy, Bucharest; University of Medicine and Pharmacy of Craiova; "George Emil Palade" University of Medicine, Pharmacy, Sciences, and Technology, Tîrgu Mureş; "Grigore T. Popa" University of Medicine and Pharmacy, Iaşi; Victor Babeş University of Medicine and Pharmacy, Timişoara; Other)
- Year of study (Numeric question with open-ended response, 1-6)

Section 2. Triage

- If you witness a road accident with victims, how prepared do you feel to provide first aid? (Single choice question on a Likert scale from 1 to 10, where 1 means "Completely unprepared" and 10 means "Very prepared")
- If you witness a road accident with victims, what will your attitude be? (Single choice question: I will perform triage and provide first aid; I will try to help; I will call 112 without getting involved; I will continue on my way without doing anything)
- Have you ever heard of the concept of polytrauma (ATLS - Advanced Trauma Life Support)? (Single choice question, Yes/No)

Section 3. I Have Heard of Polytrauma

- In a few words, explain what you believe the concept of polytrauma refers to. (Open-ended question)
- How did you learn about it? (Mention all options) (Multiple choice question: In-person courses, Online courses, It was taught at university, Treatises/Protocols/Journals, Internet)
- If it was presented in a course, please specify which subject it was. (Open-ended question)
- On a scale from 1 to 5, how important do you find this topic? (Single choice question on a Likert scale from 1 to 5, where 1 means "Irrelevant" and 5 means "Very important")

Section 4. Evaluation

- What is the most common cause of polytrauma? (Single choice question: Assaults involving sharp weapons, Road accidents, Suicide attempt)
- What is considered the optimal time for action to save a victim? (Single choice question: the first 10 minutes, 30 minutes, 1 hour, the first 6 hours, the first 24 hours)
- What is the abbreviation for the protocol applied in the primary assessment of the patient? (Open-ended question)
- In the case of complete airway obstruction and inability to clear the airway, what do you recommend for an unconscious patient? (Single choice question: Resuscitation maneuvers, Tracheostomy, Insertion of an orotracheal tube to remove the foreign object)
- Which of the following are life-threatening conditions identified in the primary assessment? (Select all answers) (Multiple choice question: Massive Hemothorax, Simple Pneumothorax, Tension Pneumothorax, Cardiac Tamponade, Rib Fracture, Aortic Rupture)
- In which stage of the primary assessment does the score in the image fall? (Single choice question based on an image: "Airway management", "Breathing", "Circulation", "Disability", "Exposure")
- If possible, describe in a few words how you would triage patients (which patients should be prioritized, what you would mention in the call to 112 regarding the patients, any other details you consider relevant) (Open-ended question)

Section 5. I Have Not Heard of Polytrauma

- Try to describe in 1-2 sentences what you think the concept of polytrauma means. (Open-ended question)
- Would you like to learn more about this subject? (Single choice question, Yes/No)

Section 6. Participant's Perception of Polytrauma

- Were concepts regarding first aid in cases of polytrauma addressed in university? (Single choice question, Yes/No)
- Do you find such courses useful? (Single choice question on a Likert scale from 1 to 10, where 1 means "Not useful at all" and 10 means "Very useful")
- How do you think such courses should be included in the Medical School curriculum? (Single choice question: Mandatory course, Optional course, Elective course, Other method, I do not think they should be introduced)
- In which year of study do you believe such a course should be taught? (Numeric question with single choice, from 1 to 6)