

BRIEF ARTICLE

BLS-D, I'm ready to perform CPR!

Parma University project

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Abstract: Since 2021, the training of newly licensed physicians (NLPs) has become obligatory in Italian universities. The Italian Society of Medicine and scientific Divulcation (SIMED) proposed a training project, including Basic Life Support Defibrillation (BLS-D), to the lecturers of Medicine and Surgery department at the University of Parma, assisted by the student representatives of the Camici In Movimento (CIM) group.

Methods: Before the course, a survey was submitted to students to understand their theoretical knowledge and ability to start Cardio-Pulmonary Resuscitation (CPR) manoeuvres.

Results: 52 questionnaires were collected. 23% of students didn't show sufficient theoretical knowledge. People who had completed an eight-hour BLS-D course, according to guidelines, reported feeling more confident managing Cardiovascular Arrest (CA) (OR 32.9; 95% CI 5.6-193.8 $p < 0.01$) than those who had not. Students who had witnessed a CA showed more confidence in managing a future CA (OR 8.3; CI 95% 1.9-36.0 $p < 0.01$). 8 subjects (15.4%) had completed a BLS-D course and had managed a CA.

Conclusions: Medical students, who had already attended an 8 hours BLS-D course and witnessed a CA, proved to be more likely to handle cardiac arrest. The training course should, therefore, be included among the mandatory courses planned for a bachelor's degree.

Keywords: Cardiopulmonary Resuscitation, (Education, Medical, Undergraduate), Italy, Surveys and Questionnaires, Public Health

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Introduction

From 2021 the medical degree has become qualifying for all students who complete their studies. In this context, newly licensed physicians, i.e. qualified for the profession for less than 12 months, have to show a rapid level of autonomy, greater than that of doctors who carried out a specific professional qualification course, since they are immediately committed to working in the Italian National Health Service (SSN) [1-2].

Furthermore, the COVID-19 pandemic, which has significantly affected Italy [3], has highlighted the chronic shortage of healthcare professionals and shown the importance and value of NLPs [2]. The assessment of the autonomy degree and the training needs of the healthcare professionals is a very important issue, which universities would have to develop with specific courses. For this reason, the Italian Society of Medicine and scientific Divulcation (SIMED) has developed a specific course. The course was born by the analysis of this population's training needs [1-2] and the understanding of the satisfaction degree of the learners, and the clinical capacity deriving from the monothematic practical courses [4].

Through the analyses conducted by SIMED, we have highlighted the training shortcomings on various topics [2], but we have also shown that the training request is more concentrated on practical-clinical training [5], [6].

Moreover, we have registered greater autonomy in the management of clinical cases in certain settings, such as during the Emergency Room (ER) shift [5] in subjects trained through a specific education, which, despite this, is still deficient [6]. The training projects of the outgoing guidance are dispersed in various universities and do not present clear national guidelines [7]. This is a very relevant topic, in fact, even now medical students during the last years of the degree course have shown a sub-optimal theoretical knowledge in emergency management [8]; training in specific topics or with advanced simulation still seems to be linked only to some postgraduate courses, such as anaesthesia or emergency medicine [9 - 10]. This vision remains short-sighted, as during the COVID-19 pandemic, and does not take into account the difficult settings which the NLPs may encounter, and in which the ability to manage an emergency can be central.

The ability of the NLPs to perform CPR is still lacking [11], as well as the ability to manage an emergency autonomously. During the COVID-19 emergency, the importance of training has been central [12] and new modalities have been developed [13]. Despite that, practical training remains crucial for the emergency management [14-15], because different factors may influence its failure [16]. Considered the importance of BLS-D training for the NLPs, SIMED has organized an accredited course as an Elective Educational Activity in collaboration with the University of Parma, aimed at sixth year medical students. This course has been included in the educational curriculum of students enrolled in the sixth year of medicine for the 2022/23 academic year. Enrolments were opened on the University of Parma website and student representatives managed the enrolments.

Methods

The study design is a survey assigned to the students of the Extracurricular activities BLS-D course; it has been carried out according to the American Heart Association guidelines [17]. 54 students enrolled in the sixth year of medicine attended the course. The course was structured in groups according to the number of students: 4 groups of 12 students and 1 of 6 students. A 13-question questionnaire was distributed prior to the beginning of the course. The questionnaire was compiled before the start of the course. 10 minutes were guaranteed before the course to give all trainees the time to complete it. 2 of the questions were demographic (gender and age), 8 questions investigated theoretical knowledge (closed answer with 4 possible answers) and 3 (closed answer with dicotomic answers) were related to previous experience with Cardiac Arrest CA (having attended a course, having witnessed a CA or being prepared to undertake a CA). A score from 1 to 8 was assigned to the individual learner based on the number of correct answers. In the first 8 theoretical questions, it was possible to decide on one of the 4 answers for each question. Only one answer was correct, and one point was awarded for each correct answer. In this way, a score from 0 to 8 could be achieved depending on the number of correct answers.

The study was developed in line with the Declaration of

Helsinki and has been approved by the SIMED council. The anonymity of the students was ensured during the collection of the questionnaires by the SIMED instructors.

The course was carried out at the SimLab simulation center of the University of Parma.

Results

Of the 54 questionnaires distributed, only 52 were fully completed by the learners, all questionnaires was anonymous. The interviewed population had an average age of 26.2 (SD: 1.9), was composed of 33 (63.4%) female subjects and 19 (36.6%) male subjects. The mean score on theoretical knowledge was 5.6 (SD: 1.3). Of all the interviewees, 12 of them (42.3%) registered a score lower than 5, which is defined as insufficient. Comparing the population with insufficient theoretical knowledge (score lower than 6) with the population who registered sufficient theoretical score (score higher than or equal to 6), the self-reported safety in managing a CA did not change (OR 0.3; 95% CI 0.06-1.07 $p=0.07$).

Regarding previous experiences with cardiac arrest, 40 (76.9%) did not attend a BLS-D course of at least eight hours according to guidelines [18], one person did not answer, while the remaining 11 (20.0%) completed at least one course. Concerning CA, 40 (76.9%) learners did not witness a CA, 1 did not respond and 11 (20.0%) witnessed at least one CA. Finally, only 14 (27.0%) interviewees feel ready to manage an CA, while 1 did not respond and 37 (71.2%) do not feel ready.

Among the interviewed population, subjects who attended an eight-hour BLS-D course, according to guidelines, report feeling confident in managing a CA (OR 32.9; 95% CI 5.6-193.8 $p<0.01$). For those who witnessed a CA, the odd of managing a CA is higher (OR 8.3; CI 95% 1.9-36.0 $p<0.01$). As many as 8 subjects attended a BLS-D course and managed a CA, this figure represents the 15.4%.

The gender did not influence predisposition to manage a CA (OR 0.6; 95% CI 0.1-2.2 $p=0.4$).

At the end of the training course, performed according to American Heart Association guidelines, all 54 students successfully passed it, with adequate theoretical and practical scores.

Table 1. Percentage of correct answers to the questionnaire's questions.

Question	% of correct answers
Indicate the incidence of CA in Italy	23.0%
Indicate the first cause of CA	98.0%
Indicate the frequency of chest compressions	69.2%
Indicate the ratio between compressions and ventilations	78.8%
Performing a mouth-to-mouth ventilation in case of lack of PPE...	67.3%
How deep should chest compressions be?	88.5%
To perform insufflations into an adult patient the head must be:	65.4%
How long should you wait before using an AED device?	73.0%

Discussion

The newly licensed physicians may come across the management of a CA in various settings, for example as a doctor at sporting events, or during a shift in the clinic or in the ward. For this reason, Universities must manage outgoing guidance by providing specific practical modules. Our study aims to investigate how relevant BLS-D training is to ensure greater self-report safety of the NLPs in managing a CA. From our analysis it emerges that the theoretical knowledge of medical students is not sufficient for 42.3%, but above all the theoretical knowledge does not influence the predisposition to manage a CA. This information, probably linked to the importance of the practice already highlighted in previous studies, shows how a practical BLS-D course is central to guaranteeing greater student safety. The aspects that significantly influence the safety in the management of a CA consist in having attended

an eight-hour BLS-D course or having witnessed a CA. These two aspects are important in this process. The most relevant data is the role of practical training, which has an OR of 32.9. Unfortunately, we register a large 95% CI, 5.6-193.8, but a strong significance ($p<0.01$); this could be related to the small sample and, in this sense, the same study could be re-proposed with a larger sample. However, we point out that such a large value strengthens the training project proposed by SIMED and highlights the importance of this education. It is very important to notice that 15.4% of the students attended a BLS-D course and then faced a CA, highlighting how the CA is a very common occurrence, and it represents a real challenge for the healthcare staff. As a matter of fact, training according to guidelines has proved to be essential to educate healthcare professionals to manage this kind of emergency, and to guarantee the ROSC (return of spontaneous circulation) for patients. A very significant data is the greater self confidence in managing a CA for subjects trained with a BLS-D course; this information shows how practical training is essential to be able to guarantee medical students greater confidence in managing an emergency such as the CA, in which the patient could die in a very short time. Practical training is, therefore, determinant for the operator self report safety in managing a CA. Finally, we point out that gender does not influence the predisposition to manage a possible CA.

The topic under study is essential to guarantee patient and doctor safety, for this reason training projects aimed at analyzing the object of study are necessary.

Practical experiences, training courses, and simulation of clinical scenarios should complement the theoretical training. However, it is not entirely clear what may be other practical-clinical training tools and methods in addition to attending an eight-hour BLS-D course according to guidelines, or witnessing a CA.

Conclusions

The BLS-D training course has proven to be central in the training curriculum of newly licensed physicians, in order to guarantee them a good degree of perceived autonomy in the management of the CA. Specific training projects will have to be promoted within the Medicine departments, also in light of the high number of interviewees who have declared that they have witnessed a CA.

Conflicts of interest

The authors declare no conflict of interest.

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References

1. Bellini L., Gambolò L., Solla D., and Stirparo G., "AM I READY?' SELF-PERCEIVED CLINICAL AUTONOMY IN ITALIAN NEWLY LICENSED PHYSICIANS," *EuroMediterranean Biomedical Journal*, 2023, doi: 10.3269/1970-5492.2023.18.4.
2. Stirparo G. et al., "SIMED-New Doc course, a matter of reflection," *Acta Biomed*, vol. 94, no. 1, p. e2023035, Feb. 2023, doi: 10.23750/ABM.V94I1.13959.
3. Stirparo G. et al., "Public health impact of the COVID-19 pandemic on the emergency healthcare system," *J Public Health (Oxf)*, vol. 44, no. 1, pp. E149–E152, Mar. 2022, doi: 10.1093/PUBMED/FDAB212.
4. G. Stirparo et al., "Satisfaction evaluation for ACLS training," *Acta Biomed*, vol. 93, no. 3, Jul. 2022, doi: 10.23750/ABM.V93I3.13337.
5. Bellini L., Gambolò L., Solla D., and Stirparo G., "Il ruolo della preparazione teorica nell'autonomia e sicurezza lavorativa dei giovani medici," XLVI Convegno Nazionale AIE, 2022. https://www.researchgate.net/publication/361668790_Il_ruolo_della_preparazione_teorica_nell'autonomia_e_sicurezza_lavorativa_dei_giovani_medici (accessed Mar. 16, 2023).
6. Gambolò L., Bellini L., Solla D., Medioli F., and Stirparo G., "Formazione Advanced Cardiovascular Life Support: quanto ne sappiamo?" 55esimo Congresso Nazionale SITI, 2022. https://www.researchgate.net/publication/364087840_Formazione_Advanced_Cardiovascular_Life_Support_quanto_ne_sappiamo (accessed Mar. 16, 2023).
7. Baldi E., Contri E., and Böttiger B. W., "Medical students' knowledge of cardiac arrest and CPR should not be based on scattered excellences," *Int J Cardiol*, vol. 298, p. 57, Jan. 2020, doi: 10.1016/j.ijcard.2019.09.041.
8. Baldi E. et al., "Final-year medical students' knowledge of cardiac arrest and CPR: We must do more!," *Int J Cardiol*, vol. 296, pp. 76–80, Dec. 2019, doi: 10.1016/J.IJCARD.2019.07.016.

9. Rothkrug A. and Mahboobi S. K., "Simulation Training and Skill Assessment in Anesthesiology," *StatPearls*, 2020, Accessed: Mar. 15, 2023. [Online]. Available: <http://www.ncbi.nlm.nih.gov/pubmed/32491643>
10. Kyriakou F., Iacovidou N., Garofalakis I., Trianti M., Stasinakis D., and Xanthos T., "Residents' resuscitation training and theoretical knowledge in a Greek General Hospital," *European Journal of Emergency Medicine*, vol. 18, no. 1, pp. 34–37, Feb. 2011, doi: 10.1097/MEJ.0b013e32833b02e4.
11. Martinuzzi M. and Jennings T., "Medical students' ability to perform CPR," *Int J Cardiol*, vol. 298, p. 58, Jan. 2020, doi: 10.1016/j.ijcard.2019.08.051.
12. Ragazzoni L. et al., "Just-in-Time Training in a Tertiary Referral Hospital During the COVID-19 Pandemic in Italy," *Acad Med*, vol. 96, no. 3, pp. 336–339, Mar. 2021, doi: 10.1097/ACM.0000000000003575.
13. Sarli L. et al., "From classroom training to e-learning: a journey through the quality of learning life of nurse students in post-graduate education - A longitudinal qualitative study," *Acta Biomed*, vol. 93, no. S2, 2022, doi: 10.23750/ABM.V93IS2.13080.
14. MacKinnon K., Marcellus L., Rivers J., Gordon C., Ryan M. and Butcher D., "Student and educator experiences of maternal-child simulation-based learning: a systematic review of qualitative evidence protocol," *JBI Database System Rev Implement Rep*, vol. 13, no. 1, pp. 14–26, Jan. 2015, doi: 10.11124/jbisrir-2015-1694.
15. D'Agostino F., Agrò F. E., Fusco P., Ferri C., and Ristagno G., "Specific theoretical and practical education on mechanical chest compression during advanced life support training courses - Results from a local experience," *Resuscitation*, vol. 181, pp. 147–149, Dec. 2022, doi: 10.1016/J.RESUSCITATION.2022.11.004.
16. Semeraro F., Scapigliati A., Tammaro G., Olcese U., Cerchiari E. L., and Ristagno G., "Advanced life support provider course in Italy: A 5-year nationwide study to identify the determinants of course success," *Resuscitation*, vol. 96, pp. 246–251, Nov. 2015, doi: 10.1016/J.RESUSCITATION.2015.08.006.
17. <https://elearning.heart.org/course/437/> Last Access [20.09.2023]. BLS Course AHA.
18. <https://www.heart.org/-/media/COB602C57891423CA795AB9D8B85B8B6.ashx> [last access 20.09.2023] [american heart association guidelines]