

THE IMPORTANCE OF GUIDELINES' KNOWLEDGE FOR THE PERCEIVED SELF-AUTONOMY AMONG NEWLY LICENSED DOCTORS

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ABSTRACT

Newly licensed physicians (NLPs) are frequently involved in emergencies, requiring a prompt and efficient cardiopulmonary resuscitation, despite poor knowledge about life-support algorithms acquired during academic studies, and low self-confidence levels. This study aims to estimate the influence of guidelines' knowledge on young physicians' self-perceived autonomy in the most common practical scenarios. In this study, 981 young Italian doctors were enrolled (mean age 26.6 years old). The recruiting process was carried out during emergency management training courses. Two self-administered questionnaires have been proposed, respectively, about the knowledge of the algorithms and the self-perceived autonomy in five different scenarios. Young, non-specialized doctors showed low self-confidence, as the average score didn't reach a "passing grade" in any of the questions asked. Only 195 doctors (19.9%) reach the "expertise" group (at least 3 out of 5 scenarios perceived as manageable). The results of the One-Way ANOVA indicate that attending the course has a significant impact on an individual's perceived autonomy. This study suggests the relevance of proper training on the algorithms during and after medical school, to form practically prepared doctors, and to allow the professionals to work safely.

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1. Introduction

The relatively high incidence (1) and heterogeneity of possible contexts in which a cardiac arrest may occur (2), justify the need for healthcare workers properly prepared to perform basic resuscitation techniques (3). Such abilities have not only a professional relevance, but a social one as well, as shown by the impact that the presence of properly trained workers in each workplace produces on the outcome of an out-of-hospital cardiac arrest (4). Timely and efficient cardiopulmonary resuscitation (CPR) can reduce the likelihood of complications and death after a cardiopulmonary arrest (3,5). Missing an effective and prompt CPR, as well as diverging from the standard protocols (6), leads to lower rates of return of spontaneous circulation (ROSC) (7). COVID-19 has shown us the effect of a reduction in prompt interventions, particularly outside of healthcare settings (7,8).

Two moments are considered vital for a correct CPR performance: early chest compressions and ventilations, with the absolute prevalence of the former (9). A proof in favor of chest compressions' relevance in defining the final outcome of the whole maneuver may be found in the design and development of automatic CPR devices, which represent the ultimate innovation.

Their use to endure high-quality chest compression is becoming increasingly more common, and several providers added specific modules in their formative programs (10). On the other hand, to highlight the importance of properly trained healthcare professionals, the 2021 European Resuscitation Council Guidelines state 'High-quality resuscitation education is mandatory for HCPs at all levels', and it underlines the necessity of life-long training to guarantee that adequate help will be provided whenever needed (11).

Other important skills that may be required in emergencies are Advanced Cardiac Life Support (ACLS), airway management, electrocardiogram (ECG) interpretation, and Advanced/International Trauma Life Support (ATLS/ITLS). Unfortunately, final-year medical students and newly licensed physicians (NLPs) still have poor knowledge about life-support algorithms (12), they lack basic professional competencies (13), and their level of self-confidence is noticeably low (14). Low levels of self-confidence are often an epiphenomenon that hides a more serious lack of proper preparedness (15), resulting in a higher risk of deviance from protocols during stressful situations such as emergencies. Noteworthy, final-year medical students and young doctors are aware of these gaps (14), and they showed interest in fulfilling them with proper programs, which perhaps are not always provided by universities, so external

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organizations are frequently required (12,16,17). Simulations may represent a crucial way to overcome this lack of abilities and confidence in medical students and young professionals. Through a controlled environment, heterogeneous contexts may be provided to give students the possibility to train and learn through practice, and their practical knowledges may even be tested (17–20). Through structured simulations, several training programs may be carried out to improve students' and young doctors' formation and to achieve a higher level of self-confidence in emergency management (20). Furthermore, participants of such structured courses showed significant levels of satisfaction, which is relevant for better self-confidence (19). Higher levels of satisfaction and self-confidence are not only necessary, but may also be crucial to balance the profound stress medical students have to face during their last year of university (23). However, it might be relevant as well to notice how previous studies have already proven the relevance of prior knowledges as among the most important predictors of ACLS provider course success (17). Thus, practical formation sometimes may not be enough by itself. This study seeks to determine whether the knowledge of BLS, ACLS, ATLS/ITLS guidelines, advanced airway management skills, and ECG understanding may be associated with perceived autonomy in various clinical scenarios (Primary Care shift, Emergency Department shift, Medical Emergency management, antibiotics prescription and medium complexity scenarios management). These scenarios were chosen because they are among the most frequent situations handled by non-specialized doctors (14).

2. Methods

This study recruited medical doctors between 25 and 29 years old. The doctors were recruited during SIMED conferences, webinars, and courses, using a proper informed consent form. They were given two different self-administered questionnaires.

The first questionnaire ("Questionnaire 1" in supplementary materials) aimed to evaluate self-assessed knowledge of BLS, ACLS, ECG, ITLS/ATLS (for pre-hospital trauma care), and airway management; this evaluation was done through five different questions.

The second questionnaire ("Questionnaire 2" in supplementary materials) aimed to evaluate self-confidence in five of the most common scenarios encountered by non-specialized medical doctors; the subjects could answer the questions by giving a score from 1 (no autonomy) to 5 (complete autonomy).

The limit between "expertise" and "lack of expertise" has been arbitrarily set for a positive self-referred knowledge of at least 3 abilities among those proposed in the first questionnaire, which are generally related to the previous participation in formative courses.

Statistical analysis

The software R version 3.6.1 for Microsoft Windows was chosen to perform all statistical analysis. The representativity of the sample was studied through a one-proportion Z-test; the relation between skills and self-perceived autonomy was studied through One-way ANOVA. The level of significance was set for a p-value lower than 0.05 (i.e., all the p-values < 0.05 were considered statistically significant).

3. Results

1301 participants were contacted for this study; 320 of them were excluded due to missing data.

The final sample consists of 981 medical doctors between 25 and 29 years old (Mean = 26.65, SD=1.33), 550 doctors were females (56%) and 431 were males (44%), their work experience ranges from 0 to 72 months (Median = 2 months, IQR=8); 195 medical doctors belong to the "expertise" group, 732 medical doctors belong to the "lack of expertise" group. The figure 1 reports the outcomes of the enrollment process and study population division regarding the questionnaires' results.

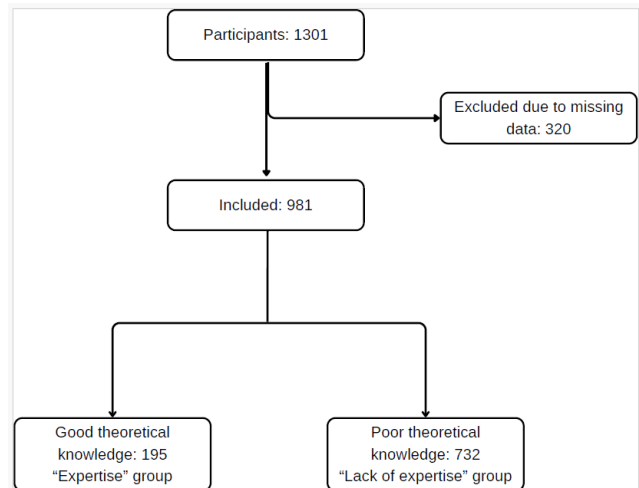


Figure 1. Outcomes of the enrollment process and study population division regarding the questionnaires' results.

The validity of the sample was tested through a one-proportion Z-test: in this study sample there are 431 males (43.93%), 44.90% of the reference population (i.e. medical doctors whose ages range from 25 to 29 years old) are males (FNOMCEO data), thus the Z-test for a sample size of 981 elements is -0.608 (p=0.5043). Thus, this study sample could be considered representative of the target population.

The calculated mean scores and corresponding differences' level of significance (expressed as p-value < 0.05) for each question of the second questionnaire, between the two sub-groups of participants (i.e., "Expertise" group and "Lack of expertise" group), are reported in table 1.

Questions	"Expertise" group mean score	"Lack of expertise" group mean score	p-value
How confident do you feel about managing medical emergencies?	2.50	1.73	< 0.05
How autonomous do you feel about taking a shift in an AED?	2.30	1.56	< 0.05
How autonomous do you feel about taking a shift in Primary Care?	3.11	2.58	< 0.05
How autonomous do you feel about prescribing antibiotics?	2.91	2.47	< 0.05
How autonomous do you feel about taking care of medium complexity patients?	2.58	1.93	< 0.05

Table 1. Mean scores and corresponding differences' level of significance of each question from the second proposed questionnaire, divided for the two sub-groups of participants.

The relationship between acquired skills and self-perceived autonomy in the selected scenarios was studied through One-way ANOVA.

For every question of the second questionnaire are reported F-statistic and p-value:

- How confident do you feel about managing medical emergencies? (173.45; <0.05).
- How autonomous do you feel about taking a shift in an AED? (134.93; <0.05).
- How autonomous do you feel about taking a shift in Primary Care? (42.05; <0.05).
- How autonomous do you feel about prescribing antibiotics? (29.71; <0.05).
- How autonomous do you feel about taking care of medium complexity patients? (104.10; <0.05).

4. Discussion

All the doctors interviewed gave low scores for self-perceived autonomy in all situations; the average score didn't reach the "passing grade" in any of the questions given. Only 195 doctors out of 981 (19.9%) meet the minimum score to be included in the "expertise" group. This could be caused both by the young age of the group, from the scarce work experience, and from the Italian medical school system which favors theoretical education over practice.

One-way ANOVA results highlight that guidelines' knowledge enhances subjects' self-perceived autonomy as it gives them safe, proven, and automatic operative algorithms to follow in emergency and difficult situations; even when anxiety, fear, or the chaos of the moment could lower their ability to think clearly.

The outcomes of this study are of remarkable relevance, due to the actual lack of practical classes in the academic core curricula of many universities, as previously highlighted by our research group (25). Indeed, nowadays a national agreement is missing in Italy and each individual is in charge of their own practical formation. The absence of practical courses within universities may lead colleagues to look for external providers (24), and in some cases, the lack of autonomy and specific working conditions (26) may push young colleagues to work abroad. The knowledge of cardiac arrest is still crucial for young physicians, not only due to the heterogeneous settings in which it may happen (2, 25), but also due to the promptness doctors are required to perform in carrying out life-saving maneuvers. This latter aspect has been analyzed by our research group (12) even in confrontation with the Colleges of Physicians, and these exposed elements are vital in order to ensure patients' safety. However, beyond the level of autonomy, a complete assessment of the impact of clinical competencies reached by young colleagues is needed. The aim of further investigations will focus on real knowledge of specific guidelines to understand whether the self-perceived knowledge of young doctors is real and applied correctly in clinical scenarios.

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