Original article

"AM I READY?" SELF-PERCEIVED CLINICAL AUTONOMY IN ITALIAN NEWLY LICENSED PHYSICIANS

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A R T I C L E   I N F O

A B S T R A C T

"Newly licensed physicians" (NLPs) are medical doctors within 12 months of licensing. Medical schools in Italy mandate that all students take classes in Emergency Medicine and practice simulated and real scenarios. This study assesses Italian NLPs' self-perceived clinical autonomy and decision-making skills. We administered a cross-sectional survey of a sample of Italian NLP. 157 physicians answered our survey (56%). Females were over-represented in the sample (68%). Median age was 26 years. NLPs perceive themselves to be proficient in Basic Life Support (88%). Still, the majority do not consider themselves adequately prepared for Advanced Cardiac Support (91%) and trauma (88%). Having prior work expertise is associated with stronger self-reported skills in ECG interpretation and higher confidence in all scenarios, particularly emergency management, "complex" patients care, and antimicrobial prescription. NLPs show insecurity even in simple scenarios. Post-graduate medical education in Italy should focus on advanced emergency management and antimicrobial stewardship.

1. Introduction

We define the population of physicians who achieved medical license in the previous twelve months as "newly licensed physicians" (NLPs). We did not find a satisfactory definition of this subpopulation in previous studies.

In Italy, this is a peculiar category of doctors. Usually, they must wait up to several years to be enrolled into residency programs. Meanwhile, most of them perform several sanitary activities, many of which might involve medical emergencies (e.g. out-of-hours services).[1] Hence, NLPs should have thorough practical and theoretical knowledge of BLSD, ACLS and ITLS guidelines.

In Italy, Emergency Medicine classes are mandatory during medical school. Nonetheless, as each university is responsible for implementing curricula, the actual degree of knowledge is far from standardized. Indeed, a recent international study reported that as few as 43.4% of Italian medical students attended BLSD classes organized by their Universities [2]

Studies have shown the pivotal importance of practical experience and the early onset of formal training. [3] [4] On the contrast, both medical students and NLPs display poor practical knowledge of emergency management, in Italy and other European countries alike. [2] [5] [6]

One study shows that junior doctors seem unable to manage the most complex cardiovascular emergencies according to ACLS guidelines, despite attending specific training.[6]

Such formative experiences have been widely used as a means to increase clinical skills in young professionals [6] [7] [8] [9] [10].

Nevertheless, the amount of time and resources dedicated to this purpose by Universities seems very low, according to international studies [11]. Monothematic classes about emergency management in settings of Continuing Medical Education (CME) play a significant role in improving the skills of experienced physicians. [12] [13] [14] [15] [16]

As for trauma management, to the best of our knowledge, very few studies specifically deal with ITLS training (International Trauma Life Support). We have likened it to ATLS (Advanced Trauma Life Support), about which many studies were conducted to underline its efficiency in increasing theoretical and practical skills in managing polytraumatized patients. Nevertheless, evidence is still scarce about their actual role in improving patient outcomes [17] [18]. Monothematic courses can also be deemed very useful by participants too [15] [18].

Proper ECG interpretation is paramount in emergency management because it often guides therapeutic choices. Therefore, it is vital to train all resident physicians appropriately.[19]

We found a literature gap about ECG interpretation assessment in NLPs. Moreover, students and young doctors show difficulties in essential drug prescriptions, especially antimicrobials, and in the interpretation of clinical cases[20][21][22]. The study evaluates NLPs' self-perceived ability to follow international guidelines concerning the management of medical emergencies, and their degree of self-confidence in performing routine medical care tasks.

2. Methods

A questionnaire was provided to a convenience sample of 280 NLPs, identified via a mailing list. Inclusion criteria were: to be a doctor and to have achieved the professional license within the previous 12 months. As all data were anonymized before analysis, no Ethical Committee approval was felt necessary.

The questionnaire was divided into three sections. The first one included a demographic module. The second section was composed of five closed "yes/no" questions about the ability to manage common medical emergencies in accordance with international guidelines. Finally, the third section included five self-assessment questions regarding different working scenarios. To allow better data stratification, the answers for this last section were categorized according to a 5-point Likert-type scale, whereby "1" stands for "poor confidence" and "5" for "full confidence"[23].

Before administration, the questionnaire was pretested for relevance, language clarity and length in a small sub-sample (10 NLPs).

We calculated means, standard deviations (SD) and percentages, where appropriate, for all survey items. In two instances, we tested whether different results for the two subgroups of the sample - that is, NLPs with and without prior working experiences – could be casual. In both cases, we used non-parametric tests (Fisher's exact test and Wilcoxon rank-sum test), as the data appeared to have non-normal distributions. We used a two-sided test and set the alpha level at 0.05. Therefore, all p-values below that threshold were considered statistically significant. To favor reproducibility, we expressed actual figures instead of statements of inequality (e.g. p-value < 0.05, p-value NS). The software R version 3.6.1 for Microsoft Windows was chosen to perform all statistical analysis.

3. Results

Demographic data

A total of 280 NLPs are reached. Of those, 180 answered our questionnaire. After excluding partial answers and doctors with >12 months of medical license, 157 answers were deemed suitable for analysis, giving a net response rate of 56%. In this sample, 51 NLP were males (32%) and 106 females (68%). Mean age: 26,2 years and median 26 years (range 23–35 years, SD). 147 of 157 participants were aged under 30 (94%). 82 (52%) declared no prior work experience, while the rest of the sample had a small overall experience (1.03 months mean). Only 5 people reported a working experience of 5 months or more. All the demographic data are illustrated in Table 1.

	Total	Males	Females
Participants (n, %)	157 (100%)	51 (32%)	106 (68%)
Mean age (years ± SD)	26.2 ± 1.91	26.4 ± 2.46	26.11 ± 1.6
Age classes (n, %)			
23 – 26 years old	110 (70%)	33 (30%)	77 (70%)
27 – 29 years old	37 (24%)	13 (35%)	24 (65%)
30 – 35 years old	10 (6%)	5 (50%)	5 (50%)
University(n, %)			
Parma	100 (64%)	33 (33%)	67 (67%)
Milan Bicocca	38 (24%)	14 (37%)	24 (63%)
Others	19 (12%)	4 (21%)	15 (79%)
Prior work experience (months, mean)			
No prior work exp.	82 (52%)	29 (35%)	53 (65%)
1 – 6 months	68 (44%)	19 (28%)	49 (72%)
7 – 12 months	7 (4%)	3 (43%)	4 (57%)

Table 1. Sociodemographic data

Emergency management

While most responders felt confident in ECG interpretation, an appalling 91% of the sample professed their inability in dealing with cardiac arrhythmias according to ACLS guidelines.

Heart attack and major trauma management exhibited opposing self-assessment results – the former being assessed as feasible in autonomy by 82% of responders, and the latter ignored by an impressive 88% of NLPs. The worst self-perceived clinical autonomy was reported in airway management, with an astonishing 96% of NLPs denying adequate knowledge. All the results are shown in Table 2.

We dichotomized NLPs' work experience ("none" vs "any prior experience") and we tested the hypothesis that self-reported ECG knowledge was substantially different in the two groups. We obtained a strong and statistically significant association (OR 2.08, 95% CI 1.04 – 4.22, p-value of Fisher exact test 0.025). Table 3 shows the contingency table, Odds Ratio and Fisher's exact test results.

Questions	Yes (n, %)	No (n, %)
1. Are you able to interpret an ECG?	90 (57%)	67 (43%)
2. Are you able to manage a heart attack according to BLSD guidelines?	128 (82%)	29 (18%)
3. Are you able to manage a cardiac arrhythmia according to ACLS guidelines?	14 (9%)	143 (91%)
4. Are you able to manage trauma in pre-hospital setting according to ITLS guidelines?	19 (12%)	138 (88%)
5. Are you able to perform airways management?	8 (4%)	150 (96%)

Table 2. Survey results. Emergency management.

	ECG +	ECG-	total
Work +	50	25	75
Work -	40	42	82
Total	90	67	157

Table 3. Contingency table. Any work experience vs dichotomic ECG interpretation skills *(Work + = any kind of previous work experience (>0 months). Work - = 0 worked months; ECG+ = "yes" answer to question 1. ECG- = "no" answer to question 1; Odds Ratio (95% CI) = 2.08 (1-04 – 4.22), p-value of two-sided Fisher's Exact Test = 0.0251)*

Scenario management

Overall, participants showed reduced self-perceived autonomy in managing clinical scenarios.

There was a clear gradient of exhibited self-doubt towards risky and more invasive medical activities. Indeed, the highest mean score was 2.19 ± 1.06 (SD) for antimicrobial prescriptions, followed by out-of-hours-service, medium-complex patients, medical emergency (any kind) and ER shift. Table 4 offers a summary of all data.

Subgroup analysis

We dichotomized NLPs' work experience ("none" vs "any prior experience") and we tested the hypothesis that self-reported mean knowledge scores were substantially different in the two groups. We obtained significantly lower p-values then our pre-established alpha level (0.05), which led us to accept the aforementioned alternative hypothesis. The most significant differences were found for Emergency scenarios (p-value 0.00000375), medium-complex patients (p-value 0.000331) and antimicrobial prescriptions (p-value 0.000555). All the results are shown in Table 5.

Questions	Mean ± SD	1	2	3	4	5
1-How confident do you feel in facing a medical emergency?	1.8 ± 0.7	56(36%)	77(49%)	23(14%)	1(1%)	0(0%)
2-How confident do you feel in managing a medium complex patient?	1.99 ± 0.85	52(33%)	58(37%)	41(26%)	6(4%)	0(0%)
3-How confident do you feel about running out-of-hours service?	2.21 ± 0.88	35(22%)	66(42%)	44(28%)	12(8%)	0(0%)
4-How confident do you feel in managing an ER shift?	1.47 ± 0.66	96(61%)	47(30%)	14(9%)	0(0%)	0(0%)
5-How autonomous do you feel in prescribing antimicrobials in an outpatient setting?	2.19 ± 1.06	51(33%)	47(30%)	40(25%)	16(10%)	3(2%)

Table 4. Survey results. Scenario management. Means, SD and crude responder numbers for each possible score (1-5)

Items	No work experience	Any work experience	p-value
Emergency	1.57	2.05	0.00000375
Medium complex	1.9	2.1	0.000331
Out-of-hours service	2.1	2.3	0.00204
ER shift	1.4	1.5	0.00415
Antimicrobial	2	2.3	0.000555

Table 5. Comparison of NLPs' mean knowledge scores. No work experience (0 months) vs any work experience (>1 month). P-values of two-sided Wilcoxon rank-sum test with continuity correction.

4. Discussion

We propose to define all recently licensed physicians as "NLPs," to standardize research and advocacy about their role and importance.

To the best of our knowledge, this questionnaire is the first addressing Italian NLPs' self-perceived clinical autonomy for several topics.

Despite this, numerous study limitations must be acknowledged and discussed. Our convenience sampling strategy, the low response rate (56%), the over-representation of females and the lack of geographic diversity of the sample each constitute significant threats to external validity.

Concerning the management of heart attack, our sample of NLPs showed relatively high confidence in the training received. Indeed, just 18% of responders declared not to know BLSD. Our data agree with the research by Baldi et al. [2].

In contrast, 91% of our NLP sample was unable to handle advanced emergencies. One plausible reason might lie in the absence of specific monothematic courses in the academic curriculum. The study by Price et al. shows knowledge improvements after 6-months-length courses. [7]

In our sample, only 57% of the interviewed subjects could not interpret ECGs. Nathanson et al. [19] previously underlined the necessity to implement ECG-dedicated educational tools.

Updated, focused training on ACLS management is imperative not only for NLPs but also for specialized doctors, including cardiologists. [13 16]

Therefore, we want to highlight the importance of empowering undergraduate and continuous medical education (CME) programs tailored at medical emergencies.

In our non-systematic literature search, we identified a knowledge gap among junior doctors regarding advanced trauma life support ATLS or ITLS (international trauma life support). Indeed, in our sample, 88% and 96% of NLPs were unable to manage trauma and airways, respectively. Abu Zidan and colleagues [17] performed a systematic review of ATLS training support, where they highlighted its usefulness in enhancing knowledge. Evidence-based approaches to implement and study ITLS training are lacking. Future research should consider investigating the role of healthcare professional training in improving patient outcomes for both topics.

The result of our questionnaire concerning the confidence perceived by NLPs in facing different scenarios shows a poor level of confidence across all scenarios. The most relevant data was the mean score of 2.19 ± 1.06 in antimicrobial prescription, and 2.21 ± 0.88 in the management of out-of-hours services. These are two low-risk, routine situations in which we expected NLPs to display much higher confidence. As antimicrobial resistance (AMR) is listed among the top-10 healthcare issues by the WHO, such a degree of unfamiliarity about antimicrobial therapy is unacceptable. It is, therefore, vital to train physicians comprehensively about this topic, to avoid inappropriate antibiotic prescription.

NLPs' confidence in handling medium complex patients is underwhelming. The mean knowledge score assigned to this point in our questionnaire was only 2.0 (1.9 – 2.1 in the two subgroups). This finding highlights the importance of specific training for medical students, NLPs and resident doctors, to achieve full professional independence.

Furthermore, interviewed physicians showed poor mean confidence indexes for running ER shifts. The lack of previous working experience in the field might have affected the results.

Italian NLPs seem to lack autonomy and confidence in advanced management of cardiac and traumatic emergencies (ACLS and ITLS), as well as in some less risky activities, like antimicrobial prescription or running out-of-hours service. Therefore, it is vital to implement appropriate undergraduate curricula and continuous medical education (CME) geared on problem-based learning through clinical case-based classes, to guarantee wider autonomy.

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