

Systematic Review

Implementation of National Licensing Examination (NLE) and its Impact on Global Healthcare: A Systematic Review

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ABSTRACT

Background: A license required for full practice - National licensing examinations (NLEs) are required in most of the countries with well-established medical regulatory authorities.

Objective: This systematic review aims to investigate the impact of NLEs after their implementation worldwide.

Methods: Systematic review designed as per Kane's validity framework developed by Olivary et al. by exploring online databases such as: Wiley Online, Embase Medline (EBSCO); PubMed; JSTOR; Google Scholar and ScienceDirect; from January 2005 to December 2020.

Results: NLE exams and better patient outcomes (communication, satisfaction) are positively related and such exams help in development of a common medical curriculum and a better post-graduation entry point.

Conclusions: In the present era, where more medical graduates are flying all across the globe for employment than ever before, NLE is becoming inevitable and helps to ensure that medical training satisfies a minimum standard of quality, which varies among Medical schools and colleges within a country and globally. Continual improvement is crucial for the identification of gaps in the medical licensing exams. The license holders must comply with National authorities and stay active in academic and clinical activities to stay licensed.

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Introduction:

There are approximately 3000 medical schools and colleges worldwide. According to World directory of Medical Schools (Online), the largest number is as: 392 in India, followed by 242 in Brazil; 184 in the USA, 158 in China, 96 in Pakistan, 92 in Mexico, 80 in Japan, 78 in Russia, 74 in Indonesia and 73 in Turkey¹. The number of medical schools in the world expanded considerably (by around 54 percent) between 1995 and 2003, and has continued to rise since then². After medical graduation from a medical institute or university, the process of entering the clinical workplace is indeed a crucial part of a medical professional. But it takes a minimum standard protocol to handle the patients and for this need, a number of academics and educa-

tionalists are of the view that all new doctors should be evaluated to ensure that they have met a minimum standard of competence³. Worldwide the medical regulating authorities regulate entry into practice within their countries by establishing their national licensing examinations (NLEs); the most distinguished is the United States Medical Licensing Examination (USMLE)⁴.

Until recently the United Kingdom (UK) did not have an NLE and all the UK medical schools were inspected by General Medical Council (GMC) while for the overseas graduates were routed through "Professional and Linguistic Assessments Board (PLAB) Examination". Now the GMC has announced that from early 2024, international medical graduates after the PLAB test will have to take the Medical Licensing Exam (MLA) if they want to apply for registration with a license to practice

in the UK⁵.

Of every 1000 NHS staff, 854 are British, 58 are Asian, 54 are from Europe, 25 are African and 09 are from somewhere else. The top ten non-EU nationalities in the National Health Service (NHS) are Indians followed by Filipino, Irish, Polish, Nigerian, Portuguese, Italian, Spanish, Romanian and Pakistanis working in healthcare system of the United Kingdom (UK)⁶. Following the UK's announcement in 2015 to implement NLE in 2021 (which was delayed till 2024 due to Covid-19), India passed her National Medical Commission Act in 2019, and pledged to implement the National Exit Examination (NEXT) from 2023⁷. Whereas Pakistan Medical Council initiated NLE in 2021 after passing the PMC Bill in 2020. The National Medical Authority in Pakistan successfully implemented the NLE test, consisting of 200 multiple choice questions as well as 20 Clinical Skilled Examination stations⁸.

The evidence retrieved through this systematic review will be helpful for the regulators and policy makers in formulation and reforming of the National Licensing Examination system.

Methods:

This systematic review protocol was established on narrative synthesis protocol⁹. The articles published between 2005 and 2020 in English language were extracted using internet from online databases such as Wiley Online, PubMed, Google Scholar, JSTOR and Science Direct. Keywords used were: national licensing examination, medical licensing, healthcare professionals and medical exams. Initial screening was based on reviewing of the titles with abstracts, and later an evaluation of full-text articles was done, and data such as: author, publication year, and key findings were retrieved (as shown in Table 1).

We included examinations that were after-graduation and related to licensing and specialist examinations, University or School level exams and exams outside healthcare were excluded. A limitation of this study is that it views the NLE related issues of highly developed countries only.

We adopted the validity framework developed by the Olivary et al. which is based on the components of the Kane's validity theory to evaluate the impact of the

licensing exam in healthcare. This methodology is based on the ITC 2020 guidelines¹⁰. The components are: (a) domain definition, (b) evaluation, (c) generalization, (d) explanation, (e) extrapolation, and (f) utilization¹¹. We used the impact as a consequence in our review. Using standardized data extraction form, the study characteristics for validity (such as publication bias, limitations, or inaccuracy of results) were accessed for study quality.

Records identified 4940 Database Search results, and after duplication removal the number of records were 445. A total of 168 studies was matched against the framework which rejected 151 studies and finally 17 studies were reviewed systematically following PRISMA guidelines. (Figure 1)

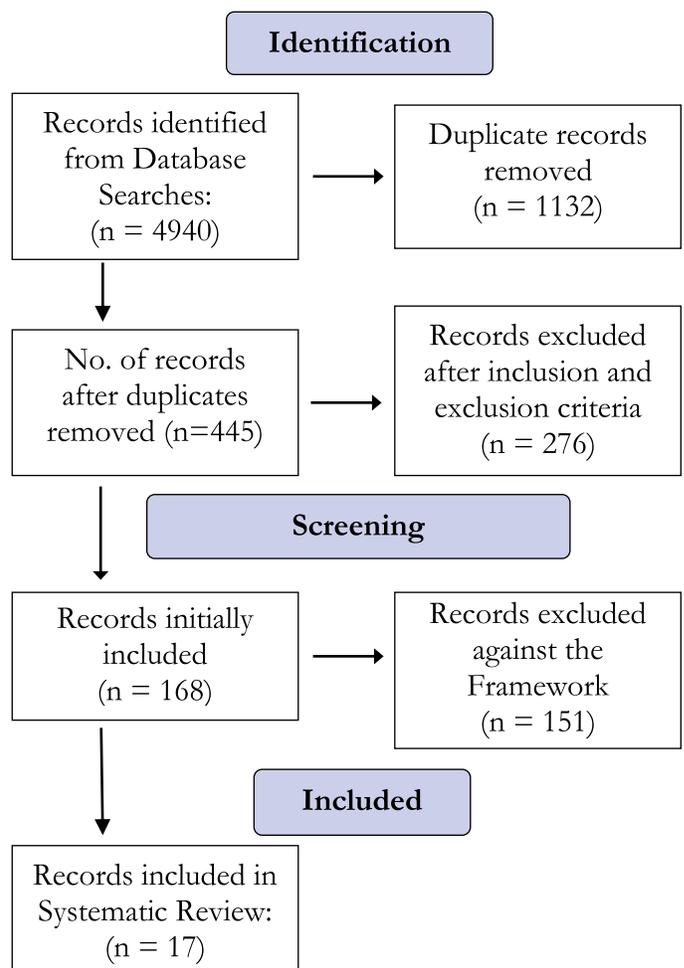


Figure 1: Framework

Results:

The review of the literature initially included 168 papers, consisting of quantitative, qualitative, mixed

methodology studies as well as expert opinions and editorials on the topic. 17 papers were finally selected against the framework and contained relevant materials

and evidence for NLE. The key findings in these studies are described in the following (Table.1)

Table 1: *Summary of selected studies or key finding of the selected studies.*

Author (S)	Year	Place of study	Key Findings
1. Williams et al. (12)	2020	(New York) USA	In the United States, the AAMC recently decided to report subsequent USMLE results as pass/fail instead of numerical points. This will facilitate its licensing purpose while simultaneously reducing its value for residents' selections.
2. Han et al. (13)	2020	Republic of China	The NLE is in place in China for medical graduates since 1999. In 2015, China's central government used a second NLE to expand the number of qualified village doctors in rural Settings.
3. Hidayah et al. (14)	2020	Indonesia	Indonesia has embraced the NLE to ensure the quality of trained practitioners and to improve the value of all its medical schools, that have seen consistent growth in numbers over the past decade.
4. Gauer JL, Jackson JB.(15)	2018	(Minnesota) USA	The Medical College Admissions Test (MCAT) predicts high success rates on licensing exams.
5. Price et al. (16)	2018	Plymouth, UK	National licensing systems in the most developed countries must operate in the light of both a physician shortage and a growing mobility of medical personnel around the world.
6. Archer et al. (17)	2016	Plymouth, UK	The dilemma is that if medical graduates pass with scores in the bottom quartile, they will have a difficult time finding work, in both United States and internationally. Those with greatest scores, on the other extreme, are much more likely to get the best positions.
7. Cuddy et. al (18)	2016	Philadelphia USA	Higher USMLE Step 2 CK scores show a negative relationship with disciplinary action on doctors' performance in practice.
8. MacDougall et al. (19)	2015	(Edinburgh) UK	Recently, the implementation of a UKMLA announced by the GMC, can lead to competency regulation in healthcare field.
9. Berendonk et al. (20)	2015	Switzerland	Quality assurance Standard and the meetings of the trainers have proved effective for reliability, and the effective implementation of action research principles has affected the development of Federal Licensing Exam in Switzerland.
10. Guttormsen et al. (21)	2013	Switzerland	Administrations of the new Federal Licensing Exam (FLE) show that the examination concept may indeed be applied as anticipated.
11. Kenny et al. (22)	2013	Canada	NLEs are also encouraged by strong organizations. There have been some strong correlations amongst medical school grades and exam-based and subjective outcomes.

12.	Lillis et al. (23)	2012	New Zealand	Most Failed stations can be identified and rewritten or evaluated after a licensure exam. Both examiners and candidates complete the anonymous feedback forms.
13.	Seyfarth et al. (24)	2010	Bavaria Germany	In Germany, a second test day was added from 2002, in addition to continuous routine examination of the old medical licensing norms, where physical and clinical testing are now conducted.
14.	Harden et al. (25)	2009	Dundee, Scotland	The benefit of utilizing standard European examinations outweigh the downsides as they have significant educational, cognitive, operational, budgetary, societal, and ethnic aspects associated with the centralized exam's establishment.
15.	Bajammal et al. (26)	2008	Saudi Arabia	In Saudi Arabian healthcare, medical feedback and reports on medical errors are in demand now a days so a National Licensing Exam can be a barrier to worst outcomes.
16.	Hecker et al. (27)	2008	USA	Basic science concepts, supervised patient care, and unsupervised patient care are all impacted differently with different curricula or teaching methods in schools.
17.	Alan Rowe, Mila García-Barbero (28)	2005	Copenhagen Denmark	For re-licensing/renewal of a medical license there are specific regulations, notably verification of continuing medical educational activity.

Discussion:

According to William et al., high marks on Step 1 exams indicate a high chance of clearing the Step 2 exam. The authors highlight the Chinese model of alternative therapies, in which minority patients report improved communication, contentment, and adherence to medication when treated by doctors who are akin to them¹².

As per Han et al., mainstream medical graduates in China have already been able to take the MLE and obtain a professional license from 1999. China implemented a National Rural Doctor Education Plan (2010–2020) in 2013, requiring its city councils to provide the training to doctors who are working in rural communities. This training is now offered and emphasizes on public health principles, as well as diagnosis and treatment of illnesses. The Government of China introduced a separate medical licensure test for rural general practitioners in 2015, with aim of expanding the quality and quantity of trained healthcare practitioners in rural areas who can join and work as doctor assistant upon getting certified¹³.

In 2006-2009, ten ASEAN countries (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam) had a mutual recognition arrangement (MRA) for nurses, medical, and dental professionals. Thailand, Philippines, Indonesia, and Malaysia, have NLE implemented due to an incrtising medical schools especially during the last decade, leading to concerns of differential quality of education delivered¹⁴.

High scores on the Medical College Admissions Test (MCAT) predict high rates on NLEs, according to Gauer JL and Jackson JB¹⁵. Price et al. have raised concerns about the implications of NLE implementation in high-income countries and have suggested, that NLEs must operate keeping in view the physician shortage and a growing mobility of medical personnel around the world¹⁶.

Archer et al. mentioned that the medical student's performance differs significantly in evaluation exams based on the fact that which medical school they went. NLEs could help build the standardized medical curriculum

and provide the opportunity to strengthen that. The writers also noted out that a candidate's attributes or abilities fade with time, so even a brilliant student can do poorly in stressful settings¹⁷. Cuddy et al. conclude that since high scores are associated with fewer disciplinary sanctions in practice, Step 2 CK scores are an essential tool for ensuring that access to medical care provision is limited for those that can administer safe patient care¹⁸. MacDougall et al. revealed a significant variation in test practices among the different medical schools in UK. The authors concluded that, as the UK does not have an NLE yet, so there is no adequate evidence which can prove that their medical graduates meet the same level of competence. The introduction of a national licensing exam in near future could help in alleviating this difficulty¹⁹.

Berendonk et al. discuss the Federal Licensing Exam (Clinical Skills) the FLE-CS; conducted in German and French languages in Switzerland since 2011. Through better quality assurance measures, a review board at the National level, and regular meetings of the Board members, the FLS-CS exam implementation proved a success²⁰. Guttormsen et al. supports this study and adds that FLE-CS has improved a lot since its inception and in future more clinical reasoning strategies and real simulations will be used with high-fidelity simulator computers which can present clinical pathologies with sounds and video for example heart murmurs, wheezing, or gait disorder more realistically²¹. Kenny et al. emphasize that in modern times, the change from knowledge-based towards performance-based has opened new horizons for exam outcomes. Generalized examination performances and medical school grades are linked with better performance in National Licensing Exams²².

Lillis et al. informs that In June 2002 the new German national medical licensing regulations (ÄAppO) came into effect. Along with simulated patients, real patients were included in NLE exams²³. Seyfarth et al. report with a study in two German Medical universities and inform that ÄAppO requires: "The candidate must show in a case-related manner that he/she knows how to apply the knowledge obtained during his/her studies in the practice of medicine and that he/she possesses the interdisciplinary basic knowledge and the necessary skills and abilities"²⁴. However, Ronald m. Harden clai-

med that such development may be seen as damaging schools' status by implying that they were unable to make significant decisions for their students²⁵.

According to Bajammal et al, the majority of Saudi Arabia's medical schools use their own distinct and independent exam approach. As a result, the methods used to assess knowledge, capabilities, and behaviors differ considerably. The Saudi Commission for Health Specialties (SCHS) conducts the Saudi Licensing Exam, which is an acceptance test. NLE is required for standardization in a setting where many Saudi medical students receive scholarships to study medicine abroad. Due to increased awareness, medical feedback and reports on medical errors are also in demand now a days so a National Licensing Exam can be a barrier to worst outcomes²⁶. Hecker et al. concluded that on three medical education areas: basic sciences concepts, supervised patient care and unsupervised patient care, different types of curricula or educational policies within schools have slightly differential impacts on students' performance on USMLE exams²⁷.

In a WHO Europe report, Alan Rowe and Mila Garca explain in detail how compulsory activities with credit points, such as continuing medical education (CME), are necessary for the new license process. These are generally given out for verified activity including following formal educational programmes, visiting institutions, participating in international conferences, delivering lectures, publishing medical articles or books, and so on. Disciplinary action could be taken if such goals are not achieved²⁸.

Conclusions:

National Licensing Exams like United States Medical Licensing Exam (USMLE)^{12,13,15} as well as about Federal Licensing Exam (FLE)^{20,21} have proven that the expected psychometric indices could be well obtained after the Implementation of these exams in US and Switzerland. NLE is becoming inevitable in modern times where more and more medical graduates move across the globe for work than ever before. These exams help ensure a minimum quality standard for medical education which varies across medical schools within a country as well as globally. The lack of trust between a physician and patient is becoming a harsh reality for the regulating authorities in the health sector. As most med-

ical students aspire for post-graduation, the National Licensing Exams can also serve as an entry test for these post-graduation courses in the future. Continual improvement is crucial for the identification of gaps in the medical licensing exams. On the other hand, the license holders must comply with National authorities and stay active in academic and clinical activities to stay licensed. Best or low-performing schools can be traced based on the NLE results, and steps can be taken the remedy the problems there, thus preventing the de-listing of medical colleges.

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