Abstract

A recent report of the Organization for Economic Co-operation and Development (OECD) points out an insufficient number of physicians in Europe. The issue seems especially relevant in the face of the COVID-19 pandemic. In this review, based on papers found in the PubMed database, we drew on the available information on the aspects of medical education and terms and rate of employment of physicians to submit potential solutions of how to increase the availability of physicians in Europe. We offer the following improvements in tackling the issue: (i) standardization of the method of verification of the number of physicians in practice for a meaningful comparison between European states; (ii) managerial reorganization of medical education to increase the flexibility of teaching; (iii) education shortening, e.g., to 4 years, for nurses, paramedics, and the like; (iv) circumscription of unnecessary health records and the use of artificial intelligence to streamline the recording system to ease the burden on the medical staff.

Keywords

Hospital management · Medical policy · Medical study · Shortage of physicians

1 Introduction

One of the biggest challenges of modern Europe is its aging population, which in upcoming decades will introduce a heavy burden on healthcare systems and economies. European states have achieved spectacular success in prolonging human life, with the average lifespan going currently beyond 80 years of age. Simultaneously, the total fertility rate, i.e., the average number of children born to a woman over her lifetime, has declined below the standard generational replacement level of 2.1. In Germany, this rate oscillates around 1.6 and, with 28% of the population being over 60, it faces a catastrophe that requires to add the fifth level to the demographic development model. In the aging society, providing enough physicians and nurses has become a primary concern. A recent report of the Organization for Economic Co-operation and Development (OECD) points to an insufficient and declining number of physicians in Europe. That seems especially relevant in the light of the recent COVID-19 pandemic (Barcelona Field Studies Center 2020; Macrotrends 2020; UN 2020; Eurostat Statistics Explained 2019). Therefore, we set out in this
review to critically address the challenges related to a shortage of physicians and suggest possible solutions that could enhance the availability of physicians in Europe. The review is based on the articles concerning the physician shortage in Europe appearing in the PubMed database as of June 18, 2020. The search was conducted using the term “physician shortage”, which returned 4328 publications. The OECD statistics concerning healthcare resources and health status in European countries were also considered.

2 European Countries Facing a Shortage of Physicians

An overwhelming majority of publications state that there is a serious shortage of physicians in Europe and that it is going to increase with time. However, the discussion should begin with a careful analysis of how the total number of physicians is estimated. The real problem might lie in the uneven distribution of medical personnel in particular countries and areas. Discrepancies are especially visible when it comes to urban and rural areas. It is also imperative to consider the aging of the physician population (WHO 2020; European Data Journalism Network 2018). In 2012, the European Commission forecast a possible two million shortage of medical personnel, a vague statement itself. In 2018, the main highlighted problems were a shortage of general practitioners despite the increasing number of doctors per capita in the EU, and the expected decline in the availability of healthcare in rural areas (OECD 2018; European Commission 2012).

The first problem is a variety of ways in which the total number of physicians is calculated in different countries. In Greece, which supposedly has the largest numbers of doctors per capita standing at 6.3 doctors per 1000 population, or Portugal at 4.4 doctors per 1000 population, data include all the licensed physicians, also those who moved abroad. This way of assessment strongly contrasts the OECD’s definition of “practicing physician”. Thus, analysts assume that the overestimation in Portugal could be as big as 1/3 of the officially provided value. In the case of Slovakia with 3.4 doctors per 1000 population, the Netherlands with 3.4 per 1000 population, and France with 3.3 per 1000 population, the official data incorporate not only the physicians directly taking care of patients, but also those working as university scholars, researchers, and even managers, which increases the statistics by 5–10%. The over- or underestimation of the actual number of physicians in the EU is a significant hindrance to the true problem assessment (OECD 2020).

The EU Commission assessment of the number of physicians is based on OECD’s statistical forecasts. Therefore, a universal definition of “practicing physician” would render the cross-countries assessment more precise and reliable. For instance, doctors who analyze in silico orthopedic implants are not considered practicing physicians, as they have no direct contact with patients. On the other hand, doctors working abroad are usually included in the overall number of physicians in the country that they had left and all too often in the country of current abode and work.

While analyzing the statistics, it is impossible to overlook the problem of a “brain drain” in Europe. Despite the increasing number of physicians, a 5% growth between 2010 and 2020, compared to an average 3% growth in other occupational groups, uneven distribution of medical school graduates presents a challenge to the current system. Staggering differences in the remuneration of doctors inside the EU, from several hundred euro a month in Estonia or Romania to 4000 or more euro in western and northern Europe, promote an exodus of young physicians from East to West and South to North. Estonia had 4312 practicing physicians in 2004, since then over 1800 of them have applied for the recognition of qualifications abroad. Considering that most of the migrating doctors are young people, another problem becomes intensified, notable the aging of doctors’ population, let alone the population at large (Berthier 2018; Hervey 2017).

There are other factors worth considering. The European Commission’s report shows that an average doctor sees 2147 patients every year –
679 in Sweden, 3457 in Hungary, and 3311 in Slovakia. It would be worthy of narrowing these statistics down, looking at regional distribution in a country, targeting the overwhelmed general practices, and establishing how many physicians are needed in a particular place. A low density of physicians in rural areas, i.e., with the population below 150 people per kilometer squared, is one of the leading problems pointed out by the European Commission. The situation is especially alarming in Finland, Germany, Czechia, France, and Slovakia. Encouraging young physicians to work in rural areas, particularly in places where they have no personal ties, is an issue throughout Europe. Some of the methods implemented to battle this problem include financial help in funding general practices and promoting applications to medical schools from students with a rural background. An interesting example is a shortened 4-year-long graduate medicine program offered by the University of Dundee in Scotland, whose aim is to enthuse potential general practitioners about working in rural areas (OECD 2018, 2020; University of St. Andrews 2020; Wilhelmi et al. 2018; European Commission 2012).

The next question that needs to be addressed is the age of practicing physicians. In 2009, around 30% of all European doctors were 55 years old or above, which is a consistent trend associated with the “baby boom” generation reaching the retirement age. An estimated percentage of physicians older than 55 years old in Europe has risen from 28% in 2007 to 38% in 2017. The countries where healthcare systems are especially jeopardized by this tendency include Germany, France, and Italy where doctors within this age group make up almost half of the entire occupational group. In comparison, the UK only has 14% of physicians above the age of 55, which might be caused by the fact that almost 25% of the country’s doctors come from abroad, and young physicians from all over Europe are prone to seek employment in the UK (Eurostat Statistics Explained 2019; Triggle 2016).

There is a different side of the problem. It can be argued that older physicians with longer professional experience will be sought-after in the aging society, as seniors might feel more comfortable to confide in them rather than in young graduates. At the same time, it is crucial to remember that the role of general practitioners is fundamentally different from the one of neurosurgeons who perform intricate procedures requiring immaculate dexterity. A solution for the uneven distribution of physicians between rural and urban areas could be to encourage older doctors to move to the countryside, especially when they are reluctant to continue their careers in demanding clinical specialties due to cognitive and physical decline. Research conducted by McMaster University in the city of Hamilton in Ontario, Canada, as part of the Physician Review and Enhancement Program (PREP) shows that along with physician’s increasing age, the chances of involuntary oversight of patients’ needs are significantly rising. Some of the negative outcomes where more advanced age plays a role include non-comprehensive history taking, incomplete data gathering, and leaving out details in patient records. However, the same study also shows that older physicians perform better at accurate diagnosing (Eva 2002).

3 Specialization Trends Among Doctors in the Light of Shortages

Other notable issues are shortages in particular specializations and general practitioners despite the rising number of physicians. Most European doctors are specialists, their ratio to general practitioners is 3.2 to 1.0, nearly 12 to 1 in Greece, a trend that has remained unchanged for a decade, but some specialty gaps are yet unfilled. For instance, France faces shortages of obstetricians and gynecologists, while Bulgaria or Spain deal with an insufficient number of anesthesiologists or psychiatrists (WHO 2020; Eurostat Statistics Explained 2019; European Commission 2012). The analysis of graduates’ choices regarding their potential specialization is a complex problem. In the UK, the National Health Service regularly evaluates the specialization trends among young doctors. According to
the 2016 study, 27.8% of the interviewed graduates declared their first choice to be general practice, followed by anesthesiology (12.1%), pediatrics (8.6%), general medicine (8.5%), and emergency medicine (5.6%). However, further years have shown decreasing interest in choosing a general practice, and a rise of interest in anesthesiology, radiology, and psychiatry (Wilhelmi et al. 2018).

A simple glance at data does not show the full scope of the problem. A report by the National Health Service emphasizes that the percentage of graduates planning to pursue a career in general practice makes up less than half of the UK’s demand. Voices can be heard about dramatic shortages in the radiology sector, with as much as one-third of all radiologists in the UK being foreigners. Special recruitment actions have been organized to increase interest, with limited success. The Royal College of Radiologists highlights that the uncertainty caused by Brexit, with the expected difficulties of acquiring visas and transferring families to the UK, may have an impact on the foreign physician’s willingness to fill up the openings. Currently, almost 99% of the UK’s radiology departments cannot meet imaging and X-ray demands (European Union of Medical Specialists 2019; Lambert et al. 2018; Lambert and Goldacre 2011).

4 Methods of Widening Access to Medical Studies

Widening access to medical studies might yet be the most reliable way to prevent the physician shortage. Currently, there are several ways of getting a medical license in Europe. The most common in continental Europe is enrolling in a 6-year-long program of medical courses. This is an MD program with no specialization. There are three study cycles in France, two of which – PCEM and DCEM (Première/Deuxième Cycle des Études Médicales) – collectively last 6 years, with the third one focusing on specialization. A similar approach is popular among medical schools in Germany, Finland, Italy, and Poland. The UK offers a 5-year-long bachelor’s program in medicine leading to the degree of Bachelor of Medicine, Bachelor of Surgery (MBBS), after which graduates receive a temporary license. The next step is the Foundation Program, lasting 1–2 years, allowing to apply to the General Medical Council (GMC) for a permanent license. An alternative option is receiving a 4-year-long postgraduate diploma in Graduate Entry Medicine. Its equivalent in continental Europe is offered by some countries, like Poland and Czechia, but created mostly to attract foreign students, and requiring tuition fees while the regular 6-year-long program is free in these countries (Balan 2020; Killingbeck 2013).

The last model shows a lot of potential in terms of reducing the physician shortage in Europe. Although often criticized, for instance, the Portugal Medical Association describes it as being of doubtful quality and unnecessary, it widens access to medical studies. It can be argued that the 6-year-long study often does not seem like the right career choice for high school graduates. The choice may also be hampered by the entry exams obligatory in many European countries, which makes it difficult to gain real-life experience in the healthcare environment before applying. Deciding to pursue a physician’s education path might seem overwhelming at a young age. Instead, high school graduates often settle for Biological or Medical Sciences. It is a reasonable assumption that a degree in a related discipline could be a sufficient foundation for an accelerated program in medicine. Thus, creating the possibility of an accelerated tuition-free 4-year-long medical study, taught in English in most European medical schools, would be a step toward mitigating a downturn in the number of physicians (Martinho 2012). The implementation of this idea might lead to more students graduating with a medical degree. Moreover, the knowledge and skills of biologists or biomedical scientists, whose job prospects in some of the European countries are off-putting, would greatly supplement their medical training, allowing the society to benefit from extensively educated graduates.
5 New Technologies in Aid of Limiting a Shortage of Physicians

The volume of health records grows every year. A study carried out in 2016 shows that doctors use 27% of their work time directly interacting with their patients, compared to 49% of the time spent on filling in health records. Solving this problem requires an in-depth verification of the currently existing system of the accumulation of health records and erasure of the duplicated or redundant elements. Improvements in the electronic health system could limit the load of documentation, and by doing so, increase the amount of time available for spending with the patient. Extensive research has been conducted showing that modern technologies, like artificial intelligence (AI), can limit the post-surgery complications, so much as by one-third, significantly decreasing direct and indirect costs of treating patients, but also saving the medical personnel’s time. The AI is already utilized in the healthcare field as a useful tool for scheduling appointments, online check-ins, or reminder texts for check-ups. There have been cases where AI systems outperformed experienced physicians in diagnosing diseases, especially when basing on visual data, such as classifying skin deformations or tuberculosis on chest radiographs. Although even the most advanced technologies cannot completely replace physicians in the nearest future, benefitting from its time-saving abilities could improve the efficiency of European healthcare systems (Amisha et al. 2019; Vinanzi et al. 2019; Jiang et al. 2017; Lorkowski and Wilk 2017).

6 Conclusions

The physician shortage Europe faces right now appears a complex and somewhat paradoxical issue, considering the growing numbers of medical graduates. Solutions proposed in this article could help increase the number of physicians in the sought-after specializations and rural areas. Suggested solutions are as follows:

- International standardization of the method of estimating the number of practicing physicians.
- The shortage of physicians in Europe, both general practitioners and specialists, should be verified using the counting methods presented by the European Organization for Economic Co-operation and Development (OECD).
- Key issues are the aging of the physician population and an inflexible organization of medical schools.
- It could be beneficial to introduce medical studies of shorter duration, for instance, 4 years long, for nurses, paramedics, and biological/medical science graduates in European countries.
- A circumscription of the overload of medical records using the artificial intelligence-based methods would enable physicians to devote more time to patients, the mission they are charged with.

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