

Assessing Management Education Practices and Needs among Health Workers in Croatian Medical Institutions: A Case Study Approach

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Abstract

With growing complexity in the healthcare sector, competent management education for health personnel has become essential. Croatia's distinctive healthcare environment offers an opportunity to examine the state and needs of management education within its workforce. This study explored current practices and the perceived needs of healthcare professionals in Croatian medical institutions through a case study using semi-structured interviews. Thematic analysis and cross-case synthesis revealed notable variation in management education and a clear demand for better-organized, tailored programs addressing Croatia's specific healthcare challenges. Participants emphasized the value of multidisciplinary cooperation and staying aligned with global trends, including digital processes, AI, robotics, simulations, and virtual reality, noting that different educational methods offer distinct advantages.

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Introduction

The stability and performance quality of a health care system are among the most critical indicators of a nation's development and the overall quality of life of its population. Ensuring the effective operation of a healthcare system necessitates a comprehensive understanding of process management, structural coordination, and the implementation of contemporary management practices within healthcare organisations. This encompasses essential functions such as planning, organising, staffing, leading, controlling, and informed decision-making.

Globalisation, heightened competition, rapid technological advancements, the explosion of information technologies, and increasing integration in international relations are driving forces behind transformative changes in healthcare organisations and their management approaches. Management, as a discipline, is emerging as a universal function integral to the operation of socially significant organisations worldwide. In this context, healthcare managers face particularly intricate roles, requiring innovative skills and methodologies to navigate the sector's complexities effectively.

This study examines the importance and practices of health care management, with a specific focus on Croatia, using the case study method while simultaneously addressing global practices through a review of available literature. It explores how modern management approaches adapt to a rapidly changing environment and the competitive advantages these practices can provide to individual countries. By investigating emerging strategies and their potential impact, the research highlights the ways in which innovative management contributes to the resilience and efficiency of healthcare systems. In Croatia and beyond, the ability to implement transformative practices positions healthcare organisations to better respond to global challenges and enhance their operational effectiveness.

Background

Healthcare education and management quality

Bloom et al. (2018) explain how hospitals with high management scores have high levels of clinical performance, as proxied by outcomes such as survival rates from emergency heart attacks (acute myocardial infarction or AMI). These hospitals also tend to have a higher proportion of managers with greater levels of business skills as measured by whether they have attained MBA-type degrees. The same research found that the hospital's proximity to a university that provides joint business and clinical education is associated with higher management practice scores and better clinical outcomes.

Knowledge about health service management must be integrated into the healthcare workforce to tackle obstacles such as financial constraints (Hosseini et al., 2024).

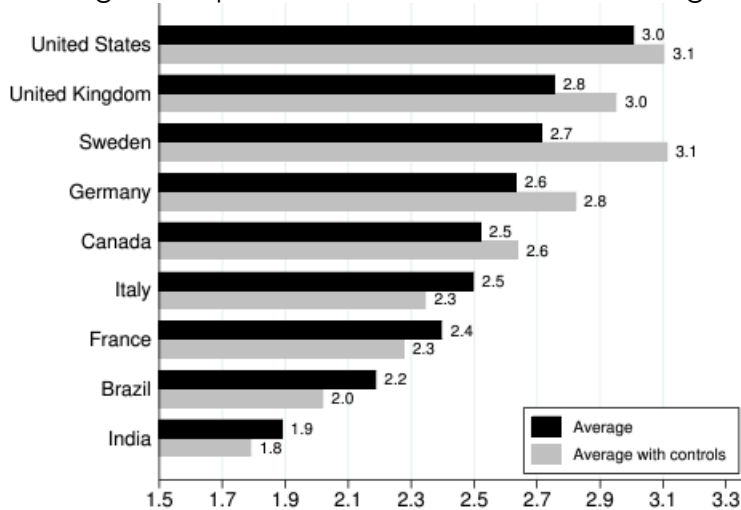
Bloom et al. (2018) state that the share of hospital managers who have attended an MBA-type course is positively and significantly correlated with the management score.

In the following graphic (Figure 1), illustrated by Bloom et al. (2018), we can see the country's average management score on a scale of 1 to 5 (all 20 individual questions are averaged within a hospital, and then the unweighted average is taken across all hospitals within a country). The dark bar shows the simple average, and the lighter grey bar shows the controls for various characteristics. Controls include a log of the number of hospital beds, ownership (for-profit, non-profit, and government), survey

noise controls (interviewee seniority, tenure, department and type-nurse, doctor or non-clinical manager; interview duration and year; an indicator of the reliability of the information (as coded by the interviewer), and 21 interviewer dummies.

Figure 1

Management practices across countries, management practices score



Source: Bloom et al., 2018.

In contrast to the results of the research by Bloom et al. (2018), Weil, P. T. (2013) states that in most of Europe, a degree from an established health management program is not seen uniformly as a key to preparing an individual to be anointed with leadership skills, proficiency in managing a facility and being well versed in the delivery of healthcare services. Furthermore, in that scientific paper, an example is given of situations in which doctors do not accept good leadership from "health management".

It is important to improve the effectiveness of training programs that may require targeted healthcare management education to develop specific managerial competencies (Ochonma, O., 2023).

Weil, P. T. (2013) suggests that the privatisation of hospitals in Croatia and other European countries may generate new demand for Graduates of health management programs.

Croatia's healthcare educational programmes

In Croatia, several renowned learning programs train healthcare managers.

Perhaps the most prominent is the postgraduate study "Healthcare Management" conducted by the Faculty of Medicine, University of Zagreb. The program, founded in 2003, is internationally recognised.

The study of health management was launched in 2001 at the School of Public Health "Andrija Štampar" of the Faculty of Medicine, University of Zagreb, in cooperation with the Ministry of Health. The program was designed because, in the world, the management of healthcare, healthcare institutions, from family medicine, public health, and clinics to the Ministry of Health and health insurance, is left exclusively to trained and qualified experts. It is stated that it is intended primarily for doctors who want to understand the management of all processes and structures in healthcare, but equally for all other professions that participate in the health system, i.e., economists, lawyers, computer scientists, experts in the development of artificial intelligence and the application of data in decision-making, psychologists, and

sociologists. The knowledge necessary for managing the health system and health services is acquired, with the latest scientific findings in the field of health system and health services research and their application in clinical management, disease management, and key resources (people, facilities, programs, institutions) and processes (financing, planning, quality improvement) in accordance with the principles of evidence-based medicine. The aim and purpose of the postgraduate professional study in Health Management is to acquire extended and specialised knowledge about the behaviour of citizens and patients when seeking health care, about health workers, health service locations, technologies, and processes for providing health care, and rational, organised process management and evidence-based leadership (Jurak, A., 2023).

Furthermore, there is a one-year training program "Healthcare Manager" at the Experta Business School, the "Healthcare Systems Manager" program at EFFECTUS University, the "Mini MBA: Healthcare Management" at EFFECTUS University, the postgraduate specialist study "Quality Management in Healthcare" at Libertas University, the university specialist study "Healthcare Management" at the Faculty of Medicine in Rijeka, and the "Nursing Management" program at the University of Health in Zagreb, which includes, among other things, business decision-making in healthcare and positive psychology in its program description.

According to the budget of the Republic of Croatia of the Croatian Institute of Public Health and the Income and Expenditure Plan for 2024, by sources of financing, it is evident that 72,209 euros were planned to be spent on professional training of employees, while 664 euros were intended to be spent on books, and 495,591 euros were spent on investments in computer programs. However, it is unclear whether health education for managers is included in professional education and whether there is education in the form of books or computer programs for this purpose. Management practices are important not only for business success but also for improving patient outcomes.

Methodology

This research is exploratory and a case study. The case study method is qualitative, as emphasised by Priya, A. (2020). It explores complex issues, allowing researchers to delve deeply into the intricacies of a phenomenon, uncovering nuances that might be overlooked in broader surveys, while also providing a holistic understanding of the subject.

The research of the available literature indicated the need for new knowledge, i.e., deepening understanding of management education, especially regarding ongoing innovations and potential dynamics between doctors and managers who are not doctors.

The case study included respondents who have significant experience in healthcare management in Croatia and enviable experience at the global level. Respondents were selected based on their leadership role, knowledge, and education related to the importance of manager education in healthcare.

The first respondent was selected for his exceptional experience in leading teams of physicians and working as a physician in several countries around the world, including, among others, Croatia, Italy, the Netherlands, and the United Arab Emirates, where he led the management of emergency medicine in a company with 4,000 employees, as well as management and medical supervision of 24 national doctors, 8 paramedics, and five nurses in the United Arab Emirates as well.

The second respondent is a master of medical laboratory diagnostics employed by the Croatian Chamber of Health Workers. He is the head of the Professional Class for Medical Laboratory Activities, coordinating and leading the work of its members.

The questions were open-ended in the form of an interview. The research results are presented according to interview topics, i.e., individual questions to which the interviewees provided answers. All questions are listed in the appendix at the end of this scientific article.

Results

- Theme 1. Discussion regarding the heads of healthcare institutions and whether they should be exclusively doctors with additional education in management, or whether they could also be professional, i.e., educated healthcare managers.

One of the respondents emphasises that there can be several answers or management models. The general manager can be an educated health manager, and the technical or professional manager can be a doctor, dentist, or pharmacist, depending on the type of health institution. Other options are to form a team of employees and for a manager who is not a doctor by profession to have a team with doctors and other health workers who have competencies that the first one does not have, or for a doctor with additional education to have a team with an economist, a financier, an IT specialist, etc. According to this respondent, this option is the most acceptable.

In private health care, he thinks that both categories should exist and perform activities that complement each other (general manager and professional manager-physician).

One of the respondents believes that, based on their basic education, the heads of healthcare institutions should definitely be CROQF level 7 healthcare professionals (not exclusively doctors), meaning that they should have a master's degree in the field, but additional education in management is mandatory.

- Theme 2. The role and impact of quality management in healthcare on treatment outcomes and patient well-being.

Respondents share similar views on this issue. One of the respondents emphasises that quality management primarily affects the quality of the institution's work, while additional factors also affect the quality of treatment and patient recovery. He emphasises the importance of excellent doctors, education, empathy, and business ethics in healthcare.

One of the respondents explained that management does not directly affect treatment outcomes because strict protocols are already defined in advance, standardising treatment methods, performing diagnostics, or preventing diseases/conditions. Furthermore, the respondent emphasised that quality management in healthcare has a direct impact on human resources (flexibility should be implemented in recruitment competitions to attract the highest quality staff) and on the efficiency of the work organisation. Such an intervention will result in better-quality service, greater patient access to information, and greater availability of healthcare services.

- Theme 3. Two key skills that a healthcare manager must have.

One of the respondents mentions communication skills (knowing how to listen, ask, analyse, prioritise, seek and obtain), leadership skills (surround yourself with a team of

quality people and not subordinates who will be loyal to you; a leader should be quality, transparent, ethical, professionally intelligent, and propulsive, problem-solving focused).

Another respondent says that a leader must understand all work processes at the level of services provided by the institution and must attract quality staff. Furthermore, one of the respondents says that workers' material rights and the protocols of each department are immutable because healthcare is a closed system for direct intervention (the public service is subject to standardised procedures and collective agreements, which are not motivating factors for employees).

- Theme 4. The importance of educational programs such as simulations, e-learning, and the use of virtual reality for the development of competencies of managers in healthcare, and the proposal of the most valuable methods of education (e.g., classic lectures, practical workshops, simulations, or online learning)

One of the respondents says that educational programs should not stagnate but should keep up with healthcare professionals and economic developments. Educators must be qualified and strive for excellence, as only then can they keep up with the rapid changes transforming the entire paradigm (digitalisation, AI, robotics in healthcare, biomarkers, genetics, etc.). He emphasises the importance of simulations and virtual reality.

According to this respondent, classic lectures focus on causal relationships, definitions, and models; practical workshops are most often in the form of case reports; simulations are excellent because they develop imagination and a multicausal approach to problems; and online reality is on the rise. The respondent emphasises that there is no difference between online and classic lectures.

One of the respondents mentioned that e-learning provides additional competencies and develops knowledge and skills. It applies to the healthcare system, while the use of virtual reality and simulations can also be effective, but to a lesser extent. The same applies to simulations. A direct approach to education is the best, whether in the form of a lecture or a practical workshop.

- Theme 5. Introduction to Croatia of educational platforms that use modern technology, such as virtual reality, for training managers and healthcare professionals.

One of the interviewees said that virtual reality and AI certainly have an important place in predicting management models. These modelling parameters are important for the outcome of a particular scenario and for comparing and connecting elements that are key to improving managers and healthcare professionals. He emphasised that virtual reality is a concept that has so far gravitated towards surgical, psychotherapeutic, and more pragmatic skills.

Another interviewee also agrees that Croatia should improve access to modern technologies, but emphasises that the obstacle is the healthcare system's financial framework, which does not see any benefit in this.

- Theme 6. The role of managers in motivating and involving healthcare workers in decision-making processes.

One of the respondents said that the manager should listen to the problems, initiatives, and real scenarios of healthcare, economic, logistical. IT workers and put them into the framework of concepts and education that should always be a few levels above, both in terms of the quantity and quality of information and the

education that the manager has. The manager motivates the best through achieved results and includes healthcare workers in the team's success.

Another respondent emphasized that the manager's role is crucial, but that a healthcare manager in Croatia has few options for engaging employees. The healthcare system, he said, is an inert, protocol-driven process, and rigid legal requirements and union interventions surround the healthcare manager. There is no room for employee involvement in decision-making.

- Theme 7. The importance of continuous education and professional development of health managers is to follow the latest trends and standards.

The respondent concludes that continuous education is critical. It includes everything from communicating with colleagues in the same profession to following literature, trade fairs, and conversations with former and even retired managers, and, through this, seeking solutions to problems that may be chronic rather than acute.

One of the interviewees explains that a health manager must be an exceptionally well-educated person who is up to date with the latest knowledge and trends in the business they are engaged in. This knowledge gives him credibility in creating a strategy within a narrow space, enabling him to improve the organisation of work. For example, suppose the manager has broad knowledge about the importance of digitisation in healthcare. In that case, improving work at the healthcare institution will be a priority by digitising smaller processes. This will make employees and patients more satisfied with the service. The respondent provided an excellent idea for a healthcare facility application that shows where a department or doctor is located, so we know which one to visit.

- Theme 8. Applicability of new trends in healthcare management (such as digitalisation and integration of artificial intelligence) and introduction of innovations in Croatia.

According to the first respondent, there is no other choice but to comply with trends. Those who do not introduce them fail, regress, make mistakes, and are no longer on the market. Furthermore, the first client notes innovation is infinite, such as the fact that the emergency service in Croatia has telemedicine, the healthcare system is digitalised, surgery is well robotised, as is physical medicine, non-invasive AI technology for measuring blood vessel flow and preventing and monitoring cardiovascular diseases (ECG, heart rhythm, etc.). Officially, all mammograms are performed using AI, and AI is especially applicable in the radiosurgery of oncological patients. Doctors routinely conduct AI research, and although they lag behind their colleagues in America, China, and India, they are working and working better. One of the key projects is "Artificial Intelligence for Smart Health and Medicine" (AI4Health.Cro), which brings together 16 partners from the public and private sectors, including the Ruđer Bošković Institute, the Ministry of Health, the Croatian Health Insurance Institute, and others.

Another respondent emphasises that, in Croatia, digitalisation of work processes in the healthcare system has been carried out in a segmented manner for years. However, there is a lack of momentum to integrate it. An example, as the respondent says, is the e-referral application, but then we again have the use of paper supplements to the e-referral. The question arises: why is an e-referral needed when the patient has to carry a paper medical history or findings from another healthcare institution? No application can serve as an e-health record in sync. Then we see the inefficiency of the e-referral. He explains that when applications are already being developed, the AI component should be included immediately. The subsequent

inclusion of the AI component will ultimately lead to high costs in the digitalisation process. The innovations comprising a comprehensive solution used in the Republic of Croatia have achieved the greatest success in the field of surgery, the second respondent confirmed, agreeing with the first.

- Theme 9. Adaptation to changes in the Croatian healthcare system on the global market and related to technological development.

The interviewee emphasized that in Croatia, basic processes are not digitized, and the digitized processes are not synchronized.

One of the interviewees pointed out that the Croatian healthcare system, with its waiting lists, scandals, and the relationship between doctors and public and private healthcare, is, to put it mildly, disorganised and not adapted to patients' needs, comparing it with the global healthcare market. Comparing the progress in healthcare and the development of technology in Croatia, he added that the answer would be a positive one.

He emphasised that there is significant untapped healthcare potential, such as health tourism, which currently exists only in a rudimentary form in dentistry. In addition to dentistry, he emphasised, there are undoubtedly many other areas of health tourism, doctor exchanges, and second-opinion diagnostics.

- Theme 10. The role of managers in ensuring a balance between costs and quality of health services.

One of the respondents explained how important managers' roles in health care are in redirecting decentralised financial resources toward digitalisation. Managerial lobbying is key here.

Another respondent emphasized that the importance of managers in this regard is unchanged in private health care. In contrast, in public health care, it is either advisory or executive, depending on whether it is in conjunction with politics, region, or global factors.

- Theme 11. Improving the decision-making process by implementing technologies such as virtual reality and artificial intelligence.

One of the interviewees stated that, in the very near future, it may no longer be possible to process valuable data without artificial intelligence. It is very possible, he said, that complete radiological diagnostics will be replaced by artificial intelligence and that management in healthcare will also include that aspect. This will improve the relevance, precision, and availability of diagnostics, as well as monitor the dynamics and effectiveness of treatment. The interviewee sees the future of virtual reality in connection with artificial intelligence. One of the interviewees emphasised the importance of speeding up the decision-making process with the help of artificial intelligence.

- Theme 12. The biggest obstacles facing managers in the Croatian healthcare system.

The interviewee notes that managers in the Croatian healthcare system lack sufficient decision-making autonomy.

Another interviewee emphasised that the outdated infrastructure and still insufficient investment in technology are noticeable, as is resistance to change, mainly in management structures. An additional problem, he said, is the low salaries of nurses and some doctors in public healthcare, the overload of healthcare workers, the departure of young people abroad, and the general centralisation of the healthcare

system. Debts to suppliers and somewhat weak financing, in relation to the growing costs associated with the need for quality diagnostics and treatment, are recurring steadily from year to year, he emphasised.

- Theme 13. The most important changes in management for improving the efficiency of the Croatian healthcare system.

The interviewee pointed out that managers in the healthcare system need extensive knowledge of the work processes within a healthcare institution and must be familiar with the professions in the healthcare system (since 99% of them are regulated professions). He emphasized that managers of healthcare institutions often lack the competence to identify the fundamental problems within the institutions they manage.

Another interviewee emphasized that the initial criteria for appointing managers are important to ensure that competent experts with relevant experience are appointed to the positions. Better integration between the public and private sectors to achieve greater efficiency and better use of resources is also important, he said, as is the introduction of innovations to test and apply new technologies, such as telemedicine, patient mobile applications, and AI in diagnostics. He gave an excellent example of the importance of implementing artificial intelligence models for analysing consumption, service efficiency, and health outcomes.

Discussion and implications

Health education in Croatia has excellent potential for development, but also great importance in terms of the country's competitive advantage through cost reduction and, as one of the interviewees suggested, the improvement of health tourism. Constant technological advances and the need to monitor them make healthcare education both necessary and complex.

Healthcare managers bring stability to healthcare institutions, and the very quality of the healthcare system speaks of the country's progress and makes it a desirable place to live.

Management in healthcare includes clinical management, disease management, and management of resources such as employees, programs, facilities, and institutions, as well as processes such as financing, planning, and quality improvement. In every aspect of management, excellence and education in accordance with trends are required.

Good management practices are important for business success and for improving patient outcomes (Bloom et al., 2018).

Case study research has deepened knowledge and, through open questions, has brought new insights into the further development of management education in Croatia.

Some main conclusions relate to the potential for teamwork in managing health institutions, with doctors and managers in leading positions; the importance of higher education; and the need to monitor trends in management education in line with global developments.

It is also important to properly recruit management employees who meet educational requirements and select empathetic employees who strive for transparency and problem-solving.

Educational programs cannot be stagnant. They should also include learning about digital processes in healthcare, AI and robotics in medicine, and related topics, as well as simulations and virtual reality.

The respondents also concluded that different types of education (simulations, classical lectures, or virtual reality) have different advantages. Some scientists confirm that simulation plays an increasingly important role in healthcare education and, in line with this, patient flow is a critical determinant of hospital performance and patient outcome that has proven challenging to optimise and should be given a special place in the education of managers (Bean, D. et al., 2018.)

Managers should lead by example, deliver results, show empathy, and involve employees in decision-making. Knowledge gives managers credibility in leading and monitoring changes. The importance of following innovations such as AI technology lies not only in educating managers but also in medical practice, including telemedicine and non-invasive AI for monitoring outcomes and disease. AI technology will improve relevance, precision of diagnosis and monitoring, and dynamics of treatment effectiveness.

Implementing AI technologies can help speed up managers' decision-making. This can also help analyse consumption, service efficiency, and health outcomes. Professors of health management studies should update their education programs in line with current trends. This will improve hospital performance and patient care, thereby enhancing Croatia's attractiveness and competitiveness. The government and the hospital, thinking in the long term, should allocate funds to ensure the best possible education for employed health care managers.

Conclusion

Every year, there are more innovations in the healthcare system and hospitals, and managers' education needs to keep up with trends and changes driven by digitalization and learning through virtual reality and AI.

Although these topics are important, there is a lack of research in Croatia on education, improvements, and guidelines for the education of healthcare managers.

Managers need excellent education aligned with trends, but also greater decision-making freedom so that hospitals operate as efficiently as possible, and Croatia has a competitive advantage in this regard. It is also recommended that teams be formed to manage healthcare institutions, including doctors and hospital managers.

Croatia offers numerous advantages for the education of managers, including top university lecturers. Cooperation between the private and public healthcare sectors is important in terms of monitoring trends and educating managers in line with the latest developments in AI technology and digitalisation, as well as attention when selecting top-notch personnel to lead healthcare institutions in terms of education, but also empathy, integrity, and a desire to solve problems.

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Appendix

Research questionnaires, interview method

- Do you think that healthcare facility managers should be exclusively physicians with additional management education, or could they also be professional, i.e. trained healthcare managers?
- Do you believe that quality healthcare management directly affects treatment outcomes and patient well-being?
- In your experience, what are the two key skills that a healthcare manager must possess?
- How important are educational programs such as simulations, e-learning, and virtual reality for developing the competencies of health care managers?
- Which education methods (e.g., classic lectures, practical workshops, simulations, or online learning) do you consider the most useful for future healthcare managers?
- Should more educational platforms that use modern technology, such as virtual reality, be introduced in Croatia to train managers and health care professionals?
- How do you see the role of managers in motivating and involving healthcare workers in decision-making processes?
- How important is continuous education and professional development for healthcare managers to keep up with the latest trends and standards?
- Do you believe that global trends in healthcare management, such as digitalisation and integration of artificial intelligence, are applicable in Croatia? What innovations are currently being introduced?
- Is the Croatian healthcare system adapting quickly enough to changes in the global market and technological development?
- How important is the role of managers in ensuring a balance between costs and quality of healthcare services?
- Would implementing technologies such as virtual reality and artificial intelligence improve the decision-making process in healthcare management?
- In your opinion, what are the biggest obstacles facing managers in the Croatian healthcare system?
- What management changes do you consider to be the most important for improving the efficiency of the Croatian healthcare system?

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