

# Environmental competencies for healthcare management at a 2nd education level as a component of strategic management

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## ABSTRACT

**Aim:** To present the results of the analysis of educational standards and curricula of the second educational level of training of specialists, who may be managers of healthcare, on the content of the environmental component as an element of strategic management.

**Materials and Methods:** Content analysis 24 educational standards of the Ministry of Education and Science of Ukraine of Ukraine for 6 fields of knowledge and 200 master's curricula from 87 institutions of higher education of Ukraine.

**Conclusions:** There is a distribution of basic leadership and management competencies both by types of these competencies and between specialties. The requirements for the inclusion of the environmental component in the framework documents are poorly expressed. The content of environmental issues in the curricula is insufficient.

**KEY WORDS:** Education Medical, Social Responsibility, Health Personnel, Environmental Health, Leadership

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## INTRODUCTION

The integrity of the natural and anthropogenic environment, defined in the OneHealth concept (human-animal-environment), is no longer controversial. Scientists agree that further interdisciplinary interaction will minimize the imbalance of effort that may arise due to the inequality of socio-economic aspects between countries. Without wider involvement of environmental specialists, especially from low-income countries, key areas of attention will be missed [1-3].

Improving the quality of healthcare is a constant challenge, and improving it with the principles of One-Health is a strategic objective. The multidisciplinary approach in healthcare management enables to take into account a greater number of aspects while increasing the coverage of quality medical services [4]. One of the responses to the challenges of environmental change and improving populational health is the education of healthcare professionals [5]. Understanding contexts, system thinking, interdisciplinary cooperation, and rational use of resources are essential for sustainable development [6]. Healthcare workers must not only assist patients and the community but also take into account the environmental determinants of which they are producers [7]. Some organizations note that the

health sector is responsible for 4.4% of CO<sub>2</sub> emissions, more than half of which comes from the United States, China, and the European Union [8].

The other component of climate change is the waste management. It is established that the healthcare sector contributes 1-2% of all waste. The main producers are hospitals, medical centers, laboratories, etc. [9]. High-income countries predominate in the amount of production of medical waste from beds, over low- and middle-income countries [10]. The last ones prevail in cheaper ways of waste disposal, such as capture, incineration, or storage. The storage takes place in open landfills along with municipal waste, influencing the environment and human and animal health [11, 12].

The same applies to the sustainable use of water resources. Unsustainable water consumption, high concentrations of chemicals, antibiotics, etc. in sewage, and the filtration network inadequacy in combination with the management imperfection of the hospitals lead to the deterioration of human and animal health [13-15].

The need to involve healthcare professionals in the problems of climate change, including the environmental component in healthcare curricula, was highlighted in official statements by the Canadian Medical Association, the American Medical Association, and

the Association of Medical Education in Europe [16-18]. Healthcare leaders should be responsible and have the opportunity to start a movement towards reducing emissions, and improving healthcare delivery while creating economic and environmental benefits.

## AIM

To present the results of the analysis of educational standards (ES) and curricula of the second educational level of training of specialists, who may be managers of healthcare, on the content of the environmental component as an element of strategic management.

## MATERIALS AND METHODS

The content analysis of ES identified the strategic management competencies, as well as the signs of environmental competencies. The content analysis of curricula shows subjects that can contain environmental knowledge.

Analyzed 24 ES for 6 fields of knowledge of the Ministry of Education and Science of Ukraine and 200 Master's curricula (accredited by the National Agency for Higher Education Quality Assurance of Ukraine) from 87 institutions of higher education in Ukraine for Specialties that can occupy the position of Head of healthcare facilities of Ukraine according to the Order of the Ministry of Health of Ukraine of 29.03.2002 No. 117.

22 «Health»: 221 Dentistry, 222 Medicine, 223 Nursing, 224 Medical Diagnostics and Treatment Technologies, 225 Medical Psychology, 226 Pharmacy, Industrial Pharmacies, 227 Physical Therapy, Ergotherapy, 229 Public Health; 07 «Management and Administration»: 071 Accounting and Taxation, 072 Finance, Banking and Insurance, 073 Management, 075 Marketing, 076 Entrepreneurship, Trade and Exchange Activities; 28 «Public Administration»: 281 «Public Administration»; 08 «Law»: 081 «Law»; 05 «Social and Behavioral Sciences»: 051 Economics, 052 Political Science, 053 Psychology, 054 Sociology; 03 «Humanitarian Sciences»: 031 Religious Sciences, 032 History and Archaeology, 033 Philosophy, 034 Culturology, 035 Philology.

The ES for the specialty 1501 «State Administration» was excluded from the analysis as at the end of 2023 is missing from State Standards.

## REVIEW AND DISCUSSION

The ES analysis was carried out based on the manager competencies, which were divided into «strongly expressed» and «mediated». The content analysis of the master's degree ES showed the most direct competen-

cies in the aspects of systemic thinking, strategic planning, and ability to see the prospect, in the standards of specialties: 031, 034, 035, 051, 052, 053, 071, 072, 073, 081, 221, 223, 281. Strong competencies in this unit were chosen: abstract thinking, analysis and synthesis, and the ability to generate new ideas (creativity). Mediated competencies are for example: "to identify and solve problems"; "to adapt and act in a new situation"; "to apply a creative approach to work in the profession"; "to solve the problems of forecasting development processes", etc.

As for the competencies that involve the ability to form a goal, communicate it to the team, and bring people together, they are not identified in 052, 075, 223, 224, 225. The strong competencies in this area are found in 051, 073, 076: "to motivate people and move towards a common goal". Mediated competencies are formulated in the following form: "to communicate with representatives of other professional groups of different levels"; "to organize professional development of specialists"; "appreciation and respect for diversity and multiculturalism"; "awareness of equal opportunities and gender problems"; etc. The combination of strong and mediated competencies is most strongly expressed in 053, 071, 229.

To implement effective management, the manager needs to be able to work in a team, develop and manage projects, based on informed decisions. The content of project management competencies and the ability to work in a team in the ES of a Master's degree is strongly expressed in 075, 225, 227, 229: "to develop projects, manage them, show initiative and entrepreneurship"; "to manage work or processes"; "to make informed decisions"; "to work in a team"; mediated expressed in the formulations: "insistence on the tasks and responsibilities taken"; "to adapt and act in a new situation"; "to evaluate and ensure the quality of the work performed"; etc.

Concerning the last block: the ability to self-development and work autonomously ("working independently" "capability for self-development, lifelong learning, and effective self-management"), as an element of self-discipline, such skills were identified only in 7 Specialties: 031, 032, 035, 054, 224, 227, and skills to self-development will receive Masters in 073.

In the context of this article, it is important to include the environmental component in the process of training specialists. Such aspects have been identified in 7 specialties, in professional competencies, one specialty in general competencies, as well as in the normative content of the program:

- 054 normative content: "develop and implement social and interdisciplinary projects taking into account... environmental and other aspects of life".

- 221
  - general: «to preserve the environment»;
  - professional: «to assess the impact of the disease on the health of the population...»;
  - normative content: «to evaluate the impact of the environment on the public health...».
- 222
  - professional: «to assess the impact of the environment... determinants on the individual, family, public health «;
  - normative content: «to assess the influence of environment on human health to evaluate the morbidity», «to organize the necessary level of individual safety ... in typical hazardous situations ...».
- 224
  - professional: to evaluate the safety and compliance with the requirements of the sanitary legislation of Ukraine, according to the results of health and hygiene studies of environmental ... factors”;
  - normative content: «to assess the impact of the environment determinants on the public health».
- 226
  - normative content: «to predict and determine the impact of environmental factors on the quality and consumer characteristics of medicines ...”
- 229
  - professional: «to assess risks and justify appropriate actions in response to emergencies in the field of public health»;
  - normative content: «to formulate conclusions, develop forecasts and conduct an analysis of the impact of determinants on public health (... environmental); “to determine the needs of different groups of the population concerning health, based on information obtained from the systems of epidemiological surveillance», etc.
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  - professional: “the ability to identify sustainable development indicators at the higher, central, regional, local and organizational levels”.

As for the availability of elements of environmental education, approximately 200 master’s curricula have been analyzed.

38 master’s curricula were presented in the field 28, specialty 281. In 12 curricula, there were 16 subjects (7 were elective) that can be attributed to the environmental education component of future healthcare managers.

Of the 168 curricula of field 07, 25 master’s programs of Specialty 071 were presented. In 6 programs were 9 subjects, which can be attributed to the component of environmental education of future managers (4 selective).

In specialty 072 features of environmental competencies are noted in 6 of 32 master’s curricula (1 of 9 subjects - selective).

The largest number of accredited master’s programs was in specialty 073. 21 of 59 curricula enclosed 28 subjects covering the component of environmental education (15 selective).

In specialty 075 (21 curricula in total) and 076 (25 programs), the component of environmental education was identified in 11 curricula (1 of 11 subjects - elective) and 14 programs (8 of 18 subjects - elective).

The directions of the subjects were: sustainable development, environmental security, social responsibility, emergency management, civil protection, and labor protection in interpretations that are close to one or another specialty. For example, some specific formulations: European integration and sustainability, State management of environmental use, Sustainable development and national security in the context of Euro-Atlantic integration, State policy in the area of ecological security, Emergency Management, Ecological safety, Environmental accounting and auditing, etc.

The University’s autonomy and the absence of a strong requirement for manager competencies lead to a different list of management skills among specialists with different basic education, which is shown in this study. Therefore, the acquisition of additional qualifications, and the need to modernize the training of managers, encourages them to engage in additional continuous education at the postgraduate level, which should contain elements of environmental education.

The development of leadership and management competencies in the general healthcare workers’ training should focus on the specific competencies of the manager. For example, the National Health Service of Great Britain has developed a Healthcare Leadership Model, which consists of nine basic parameters that can be compared with the basic parameters of our study. Another model presented by the researchers determines the competencies for the senior and middle management staff of hospitals [19, 20].

The results of the study indicate the heterogeneity of the inclusion of management competencies in the ES, especially in the unit of autonomous work, self-development, and self-discipline. Most ES mostly focus on project management and teamwork skills, as well as motivation and communication skills. However, even they are not expressed in all standards equally or equally strongly. The competencies of strategic management and system thinking are considered to be expressed on average.

The inequality of the inclusion of different leadership and management competencies in the training programs are noted by other researchers, in particular at the undergraduate level and higher educational levels

[21, 22]. Interesting is the fact that medical specialists in low- and middle-income countries are more likely to take executive training courses than doctors in high-income countries [23].

In addition to management qualities, we are interested in environmental education. This component is poorly presented in ES and therefore can be poorly expressed in the training programs. Only in 7 of the 24 ES were identified signs of environmental training [24].

In addition to the ES as framework documents, we also analyzed the curricula. Not everyone had topics that related to environmental education. The main areas of the subjects were: sustainable development, environmental security, social responsibility, emergency management, civil protection, and labor protection in interpretations that are close to one or another specialty. While sustainable development, environmental safety, and even social responsibility consider themes that broadly highlight the environmental direction, civil protection and occupational safety usually express the ecological component weaker. Most of these subjects are mandatory professional or general. Only in specialty 073 the majority of ecological subjects are selective.

Despite the challenges of climate change, anthropogenic pollution, and increasing environmental health needs, researchers note insufficient coverage of this topic in the training of future health workers [17]. Others note the insufficient awareness of educators on climate change, One Health and environmental sciences, and talk about the need to develop such

skills in the scientific and pedagogical staff, because there is a positive correlation between the inclusion of environmental components in education and the change of behavioral factors, the ability of communities to solve environmental problems, inclusion in environmental actions and actions [25, 26]. As for environmental education for healthcare workers, there are approaches and researchers note the need to include this component in the educational process, especially the leaders of the medical industry [27, 5, 6].

Since medical specialties need to pass the Specialization «Organization and management of healthcare», to take the position of Head of healthcare facilities in Ukraine, analysis of the presence of an environmental component in these programs is the object of further study.

## CONCLUSIONS

The analysis showed the uneven distribution of basic leadership and management competencies both by types of these competencies and between specialties. The requirements for the inclusion of the environmental component expressed weak, in most ES they are not contained at all, in some indirectly and in a small amount. The trend of inclusion of environmental subjects in the Master's programs is not widespread. Main topics: sustainable development, environmental security, social responsibility, emergency management. Most of these subjects are assigned to compulsory professional or general disciplines.

## REFERENCES

1. Zinsstag J, Kaiser-Grolimund A, Heitz-Tokpa K et al. Advancing One human–animal–environment Health for global health security: what does the evidence say? *Lancet*. 2023;401(10376):591–604. doi: 10.1016/S0140-6736(22)01595-1. DOI
2. Elnaiem A, Mohamed-Ahmed O, Zumla A, Mecaskey J et al. Global and regional governance of One Health and implications for global health security. *The Lancet*. 2023;401(10377):688–704. doi: 10.1016/S0140-6736(22)01597-5. DOI
3. Adisasmito WB, Almuhairei S, Behravesh CB et al. One Health: A new definition for a sustainable and healthy future. *PLOS Pathogens*. 2022;18(6):e1010537. doi: 10.1371/journal.ppat.1010537. DOI
4. Maguire W, Murphy L. Enhancing value in healthcare: towards a trans-disciplinary approach. *Accounting, Auditing & Accountability Journal*. 2022. doi: 10.1108/aaaj-06-2016-2596. DOI
5. Nayna Schwerdtle P, Horton G, Kent F et al. Education for sustainable healthcare: A transdisciplinary approach to transversal environmental threats. *Medical Teacher*. 2020;42(10):1102–6. doi: 10.1080/0142159x.2020.1795101. DOI
6. McKimm J, McLean M. Rethinking health professions' education leadership: Developing "eco-ethical" leaders for a more sustainable world and future. *Medical Teacher*. 2020;42(8):1–6. doi: 10.1080/0142159x.2020.1748877. DOI
7. Malik A, Lenzen M, McAlister S et al. The carbon footprint of Australian health care. *The Lancet Planetary Health*. 2018;2(1):e27–35. doi: 10.1016/S2542-5196(17)30180-8. DOI
8. Karliner J, Slotterback S, Boyd R et al. Health care's climate footprint: the health sector contribution and opportunities for action. *European Journal of Public Health*. 2020;30(5). doi: 10.1093/eurpub/ckaa165.843. DOI
9. Taslimi M., Batta R., Kwon C. Medical waste collection considering transportation and storage risk. *Computers & Operations Research*. 2020;120:104966. doi: 10.1016/j.cor.2020.104966. DOI

10. Khan BA, Cheng L, Khan AA et al. Healthcare waste management in Asian developing countries: A mini review. *Waste Management & Research*. 2019;37(9):863–875. doi: 10.1177/0734242x19857470. [DOI](#)
11. Duindam D. Transitioning to Sustainable Healthcare: Decarbonising Healthcare Clinics, a Literature Review. *Challenges*. 2022;13(2):68. doi: 10.3390/challe13020068. [DOI](#)
12. Singh N, Ogunseitan OA, Tang Y. Medical waste: Current challenges and future opportunities for sustainable management. *Critical Reviews in Environmental Science and Technology*. 2021;52(11):1–23. doi: 10.1080/10643389.2021.1885325. [DOI](#)
13. Khan MT, Shah IA, Ihsanullah I et al. Hospital wastewater as a source of environmental contamination: An overview of management practices, environmental risks, and treatment processes. *Journal of Water Process Engineering*. 2021;41:101990. doi: 10.1016/j.jwpe.2021.101990. [DOI](#)
14. Kumari A, Maurya NS, Tiwari B. Hospital wastewater treatment scenario around the globe. *Current Developments in Biotechnology and Bioengineering*. 2020;549–570. doi: 10.1016/b978-0-12-819722-6.00015-8. [DOI](#)
15. Liu A, Zhao Y, Cai Y et al. Towards Effective, Sustainable Solution for Hospital Wastewater Treatment to Cope with the Post-Pandemic Era. *International Journal of Environmental Research and Public Health*. 2023;20(4):2854. doi: 10.3390/ijerph20042854. [DOI](#)
16. Shaw E, Walpole S, McLean M et al. AMEE Consensus Statement: Planetary health and education for sustainable healthcare. *Medical Teacher*. 2021;43(3):272–286. doi:10.1080/0142159x.2020.1860207. [DOI](#)
17. Hansen M, Rohn S, Moglan E et al. Promoting climate change issues in medical education: Lessons from a student-driven advocacy project in a Canadian Medical school. *The Journal of Climate Change and Health*. 2021;100026. doi: 10.1016/j.joclhm.2021.100026. [DOI](#)
18. Rabin BM, Laney EB, Phillipsborn RP. The Unique Role of Medical Students in Catalyzing Climate Change Education. *Journal of Medical Education and Curricular Development*. 2020;7:238212052095765. doi: 10.1177/2382120520957653. [DOI](#)
19. Ellis P, Abbott J. Understanding the new NHS healthcare leadership model. *Journal of Renal Nursing*. 2014;6(2):90–92. doi: 10.12968/jorn.2014.6.2.90. [DOI](#)
20. Huikko-Tarvainen S. Elements of perceived good physician leadership and their relation to leadership theory. *Leadership in Health Services*. 2021. doi: 10.1108/lhs-01-2021-0002. [DOI](#)
21. Rodríguez-Feria P, Czabanowska K, Babich S et al. Divergence and Convergence of the Public Health Leadership Competency Framework Against Others in Undergraduate Medical Education: A Scoping Review. *Public Health Reviews*. 2023;44:1605806. doi: 10.3389/phrs.2023.1605806. [DOI](#)
22. Matsas B, Goralnick E, Bass M et al. Leadership Development in U.S. Undergraduate Medical Education. *Academic Medicine*. 2022. doi: 10.1097/acm.0000000000004632. [DOI](#)
23. MacKechnie MC, Miclau E, MacKechnie MA et al. Leadership development training for orthopaedic trauma surgeons: an international survey. *OTA Int* 2023;7(1):e302. doi: 10.1097/oi9.0000000000000302. [DOI](#)
24. Parker G, Berta W, Shea C et al. Environmental competencies for healthcare educators and trainees: A scoping review. *Health Education Journal*. 2020;79(3):327–345. doi: 10.1177/0017896919886599. [DOI](#)
25. Cerceo E, Vasan N. Creating Environmental Health Leaders When Educators Are Learning Too. *Journal of Medical Education and Curricular Development*. 2023; 10:23821205231219162.. doi: 10.1177/23821205231219162. [DOI](#)
26. Suárez-Perales I, Valero-Gil J, Leyva-de la Hiz DI et al. Educating for the future: How higher education in environmental management affects pro-environmental behaviour. *Journal of Cleaner Production*. 2021;321:128972. doi: 10.1016/j.jclepro.2021.128972. [DOI](#)
27. Greenwald L, Blanchard O, Hayden C, Sheffield P. Climate and health education: A critical review at one medical school. *Frontiers in Public Health*. 2023. doi: 10.3389/fpubh.2022.1092359. [DOI](#)

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## CONFLICT OF INTEREST

The Authors declare no conflict of interest

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