

Research of Ukrainian scientists on the development of national medical education systems: A meta-analysis

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ABSTRACT

Aim: To carry out a holistic structured reconstruction of the Ukrainian scientific discourse of the 1990s and the first quarter of the XXI century on the development of medical education in foreign countries on the basis of the developed meta-analysis programme.

Materials and Methods: the developed meta-analysis programme integrates the general meta-analysis methodology and methods of monographic and relevant analysis, discourse analysis, content analysis, historiographic, paradigmatic, and phenomenological analysis. These tools have been used to analyse three samples of scientific papers on the development of national medical education systems that appeared in Ukraine in the 1990s and the first quarter of the twenty-first century: the general population (the total number of papers is about 1450); a sample population (380), and a representative sample (70). 20 bibliographic indexes were processed to determine the general population (GP – total number) of scientific papers published in 1991–2024. A search was conducted via the Google engine using a combination of three groups of keywords that denoted: a) the type of publication (monograph, dissertation, article); b) the subject of the study (development of medical education abroad; training of doctors/nurses abroad, etc.); c) a list of countries and regions.

Conclusions: the results of the study showed that the historiography of the problem mentioned above has a pronounced interdisciplinary, multi-level, speciality-oriented character. The analysis of the dynamics of scientific knowledge accumulation has shown that the researchers have moved away from studying foreign experience of vocational training of healthcare professionals through the prism of its use in Ukraine under the influence of European integration processes and have begun to study national medical education systems as a separate subject. The focus of scientists' attention was revealed to be drawn to the study of trends in the development of national medical education systems, related to decentralisation of management, strengthening of university autonomy, requirements for the selection of applicants, etc.

KEY WORDS: medical education, meta-analysis, foreign countries, training of medical professionals

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INTRODUCTION

In the 1990s and the first quarter of the XXI century, Ukraine has been consistently implementing the course of European integration and joining the world educational and scientific space. This led to an increase in the attention of scientists to the study of foreign experience in medical education. As a result, a significant amount of scientific literature on this issue has been accumulated. The meta-analysis methodology is an effective tool for its holistic structured study. We consider the implementation of such a research project to be of interest to scientists and doctors from different countries for scientific self-reflection and comparison of different national receptions of medical education in foreign countries.

AIM

To carry out a holistic structured reconstruction of the Ukrainian scientific discourse of the 1990s and the first quarter of the XXI century on the development of medical education in foreign countries on the basis of the developed meta-analysis programme.

MATERIALS AND METHODS

Meta-analysis was first used in experimental medicine. Over time, this effective methodology has been adapted in the social sciences for the analysis of large amounts of scientific literature [1–7]. Based on this scientific experience and considering the subject of our study, we have developed our own meta-analysis

programme. It involves solving the following tasks in a systematic way: 1) development of criteria for inclusion/exclusion of original research into the scope of meta-analysis; 2) search and selection of studies according to the defined criteria; 3) determining and evaluating various parameters (content, methodology, quality, etc.) of the studies included in the meta-analysis; 4) assessment of their statistical heterogeneity.

More than 20 bibliographic indexes were processed to determine the general population (GP – total number) of scientific papers published in 1991-2024. A search was conducted via the Google engine using a combination of three groups of keywords that denoted: a) the type of publication (monograph, dissertation, article); b) the subject of the study (development of medical education abroad; training of doctors/nurses abroad, etc.); c) a list of countries and regions.

The resulting GP consisted of more than 1450 selection units (publications). According to the fixed effects model (after M. Borenstein [5], R. Rosenthal, M. DiMatteo [6]), a sample population (SP) consisting of about 380 selection units was formed for the secondary analysis. The selection was based on formal and content criteria (title; author; time and place of publication; type, rank, form of presentation). Priorities were given to theses and monographs, as well as original scientific articles.

Along with the method of meta-analysis, the examination of the SP was carried out using effective methods of monographic and relevant analysis as well as the main body of knowledge [1]; discourse analysis and content analysis [7]; methods of historiographic [8], paradigmatic [9], and phenomenological [10] analysis. The examination of the studies of the SP was carried out according to formal quantitative and qualitative criteria: structural and content characteristics (common, special); year of publication; author's personality; source base; methodological level; territorial vector; novelty of content, etc. Based on the results, the third sample was formed – the representative sample (RS), which consisted of 70 studies. Given that the RS fundamentally reflects the main features of the GP and the SP, it was used as the basis for the subject meta-analysis.

REVIEW AND DISCUSSION

The meta-analytical study of the research conducted by Ukrainian scientists on the development of medical education abroad is based on six main parameters: 1) diversity; 2) stages of scientific knowledge accumulation; 3) territorial spectrum; 4) methodology; 5) subject matter; 6) originality.

The GP is taken as the basis for determining the first parameter, as it gives a general idea of the

share of different types of studies on the problem under discussion. The results of formal quantitative calculations revealed that out of the 1450 units selected, scientific articles accounted for about 43%; materials (abstracts) of scientific conferences – 34%; dissertations – 4%; monographs – 2%; bibliographic indexes and other types of literature – 17%. However, it is dissertations and monographs, which, along with a number of scientific articles, formed the basis of the RS, that reflect the qualitative indicators of the growth of new knowledge on the problem under study. It should be noted that our analysis concerns only subject-specific studies and does not take into account numerous studies that address its individual aspects.

The second parameter is the pivotal one, since it outlines the changes in other components of the meta-analytical study. In general terms, the dynamics of the increase in scientific knowledge on the problem under consideration is reflected in three somewhat conditional periods: 1) post-Soviet (1991-2000), when Ukrainian scientists began to study foreign experience in medical education impartially, getting rid of old ideologies; 2) pro-European one (2001-2009/2010), when research priorities shifted to the context of Ukraine's accession to the Bologna Process; 3) country studies (since 2011/2012), when there was a conceptual reorientation of studies towards the exploration of national medical education systems of individual countries.

In this context, the third parameter was changing: the territorial range of research was gradually expanding, but remained rather narrow in general. According to formal, a priori approximate, but informative calculations, about 30% of scientific papers were related to the development of medical education in the USA; 37% – in the UK, Poland, Germany, Austria, Canada; 33% – in other European countries and, to a lesser extent, in the Asian region (China, India, Japan).

The modification of the fourth parameter – methodology – is determined by a number of key features and components: interdisciplinarity; category and conceptual apparatus; scientific and analytical tools; the nature of scientific discourse, etc. The systematic analysis showed that most of the research on the issue under consideration was developed at the intersection of medicine and pedagogical comparative studies, which examines foreign education systems. In particular, theses were mainly prepared by certified medical professionals under the supervision of pedagogical scientists and defended in the specialties of general pedagogy and history of pedagogy, as well as theory and methods of vocational education. Many articles were written by experts in the fields of economics, public administration, philosophy of

education, etc. This was reflected in the research methodology, as the authors a priori used analytical methods developed in their fields of expertise.

The terminology became a weak point of many studies, since the researchers mainly used the definitions accepted in Ukrainian science, which are not always consistent with the categorical apparatus used in the national medical education systems of the countries under study. It was also found that Ukrainian authors neglected the scientific and analytical tools developed by foreign scientists to study the professional training of future doctors and nurses in higher education institutions. The descriptive style of presenting research results and the neglect of synergy methods led to a linear descriptive coverage of the functioning of foreign medical education systems as such that develop only in an upward direction, constantly progress, do not experience qualitative and quantitative fluctuations, stagnation and crisis phenomena.

A positive trend towards understanding the functioning of foreign medical education systems from the perspective of pluralism has been observed in the works of the last decade. Acknowledging that it is difficult to achieve “generally accepted knowledge” within a certain scientific paradigm or a specific research problem, scientists have begun to critically evaluate the theory and practice of vocational training of healthcare professionals in foreign countries from the perspective of alternative and controversial views and then compare it with the corresponding domestic models.

The most difficult fifth parameter of the meta-analysis requires the clarification of the general thematic and content range of studies and their internal structure. Important insights into these priorities are provided by the analysis of the SP by titles and keywords of publications carried out using the method of relevant analysis (according to O. Adamenko [1]). The obtained results are classified into concepts-lexemes, which are divided into groups according to the frequency of use (by the formula 40-30>29-20>19-10>9-1). These groups denote the following:

I. Subject area (sphere), direction, content of the research: ‘medical education’, ‘higher medical education’, ‘pharmaceutical education’, ‘training of future doctors/nurses’ (40-30); ‘university education’ (29-20); ‘continuing/postgraduate medical education’, ‘advanced training’ (19-10).

II. Direction, trend, structure of the training process: ‘development’, ‘reform’ (40-30); ‘Bologna Process’, ‘integration’, ‘European integration’, ‘globalisation’ (29-20); ‘trend’, ‘transformation’, ‘system’ (19-10).

III. Aims and results: ‘quality of medical education/training’ (40-30); ‘professional culture’, ‘competence’,

‘professional competence’ (29-20); ‘readiness’, ‘professional communication’, ‘professional ethics’ (19-10).

IV. Organisation of the educational process: ‘training’, ‘credit-module system’ (40-30); ‘methods’, ‘methodology’, ‘theory and practice’, ‘model’ (29-20).

V. Object of study: ‘future doctors/nurses/pharmacists’, ‘medical students’ (29-20); ‘masters’, ‘bachelors’ [by specialities] (19-10); ‘teachers’ (9-1).

Based on the aforementioned territorial vectors, three priority thematic and content blocks of studies on the development of medical education abroad have been identified. The first, dominant one – Euro-Atlantic – reflects the study of the problem in the global and regional-European context. The strengthening of this trend at the beginning of the XXI century is evidenced by the information-analytical and educational materials prepared by teams of scientists [11-13], which reveal the impact of globalisation and European integration on the processes of standardisation and quality improvement of medical education (unity of approaches to licensing and accreditation; recognition of diplomas and certificates; international cooperation), etc.

The second block is represented by a large group of studies in which foreign experience in the development of medical education is revealed in terms of Ukraine’s integration into the Bologna process and its implementation in the national system of training future as well as certified doctors, pharmacists, nurses, etc. (Y. Voronenko, S. Hordiyshuk, N. Leonchenko, V. Kazakov, M. Pervak, O. Panasenko, V. Buriak, A. Kaplaushenko, O. Sichkoriz, O. Talalaenko, etc.). A number of works highlight the experience of European integration of individual educational institutions, for example, the Bogomolets National Medical University [12] and others.

The third historiographical block outlines the country studies and thematic diversity of research, so it is considered in the context of the sixth parameter of the meta-analysis, which is related to the originality of individual studies. On the one hand, they reflect the general national reception of the development of medical education abroad, and, on the other hand, they show the personal contribution of researchers to the study of this problem. Given the limited scope of the article, we synthesise this legacy from the perspective of phenomenology, highlighting the productive narratives that are characteristic of each work.

T. Khvalyaboga’s doctoral thesis (2020) presents a comprehensive analysis of the history of professional training of doctors at US universities in two stages: pre-reform (early XVII century – 1910), which indicates its formation in the conditions of functioning of unaccredited private schools, and post-reform (1910

– early XXI century).), when the system of academic medical education was formed due to the introduction of accreditation, expansion of the list of professional disciplines, increasing role of scientific research, etc. It is the models of its functioning developed by the researcher that look interesting: structural (covering bachelor's, MD and DO degree programmes that are implemented in hospitals and consulting schools) and functional (denoting the undergraduate and postgraduate stages of professional training of doctors) [14]. Such a reception holistically reflects the essence of the phenomenon under study and creates the foundation for its comparison with the models of medical education in other countries.

We can compare the above-mentioned paper with M. Shumylo's dissertation (2023) on the functioning of the system of higher medical education in the USA in the XX-XXI centuries. Having traced its genesis since 1620, the author analysed the factors behind its development (social conditions, level of education, multiculturalism, decentralisation of education management, financial and technological support) and characterised current trends of modernisation in the form of strengthening state control over the quality of education as well as diversification of medical training specialities, etc. These two papers provide an example of how differently the content is revealed in studies that are similar in subject matter [15].

The studies on the development of higher medical education in the UK are also worth comparing. K. Magrlamova's doctoral thesis outlines the concept of its functioning, which is manifested in the following aspects: implementing strategies for professional training of international medical organisations; integrity of medical education as an open system that is subject to influence on the part of social factors and includes target, theoretical and methodological, organisational, content, technological and performance components; and the graduated system, which is implemented through the alternate obtaining of bachelor's, master's and doctoral degrees. This paper is favourably distinguished by showing the peculiarities of medical education in different regions of the country (England, Ireland, Wales, Scotland), clarifying the impact of Brexit on its development and showing this process in the dynamics of five stages. The presented classification of British medical education institutions divides them by the nature of their functioning ('old', 'new', 'open') and by the organisational structure (federated, collegiate, unitary), etc. [16].

A comprehensive understanding of the system of professional training of family doctors in the UK medical schools is provided by the work of I. Palamarenko, who showed its genesis, organisational principles, structural

components and characteristics of its functioning stages: admission; enrolment; professional training process; postgraduate education; advanced training. It is highlighted that the balance of its development ensures the alignment of public needs for medical services and personal interests of future doctors, which are determined at the stage of pre-professional training [17].

Along with the works mentioned above, which claim to provide a comprehensive understanding of national medical education systems, we note studies that reveal individual areas and components of their functioning. Thus, having carried out a comparative analysis of the formation of the communicative culture of medical students in the UK and the USA, Y. Hrebenyk-Kozachenko revealed the common and special features of their organisational and pedagogical foundations [18]. Also, from the perspective of Ukrainian didactics, N. Symonenko showed the organisation of independent work of students in medical colleges and universities in the United States [19].

The 'overseas' vector of research is expanded by the work of Yu. Lavrysh on the training of nurses in Canadian universities. She gives an example of the approach described above, when the model of medical education of a particular country is revealed through the prism of general standards and characteristics inherent in all national systems of professional education. From this perspective, the author has shown the peculiarities of the tiered training of nurses in Canada (bachelor's, master's, doctoral degrees in nursing): differentiation by specialties and curricula; focus on psychological, pedagogical and technological training; continuity of professional development through the activities of professional associations, etc. [20].

The 'European' vector of the research on medical education is widely represented by studies on its development in German-speaking countries and Poland. As an example, N. Kuchumova's comparative analysis of the national models of pre-professional, professional, and postgraduate medical education in Switzerland, Germany, and Austria is worth mentioning. According to the author, the general trends of European policy contributed to the unification of their standards and the transition to the principles of student centred and patient orientation approaches [21]. By contrast, H. Klishch's thesis proves that along with European standards, the development of medical education in Austria was determined by the national reforms that defined its 41 standards and priorities for modernising the clinical base, attracting the best researchers and medical practitioners to teach, and preparing students to conduct preventive and educational work with citizens [22].

Among the studies that reflect the development of Ukrainian medical polonistics, the monograph by L. Hryshchuk and V. Horodetsky (2006), who conducted a systematic analysis of the history of medical education in Poland with an emphasis on trends and experience of its modernisation during the 80s and 90s of the XX century, should be noted [23]. Also, the thesis of K. Khomenko (2017) on the formation of professional competence of future doctors in Polish universities in 1990-2015 is worth noting. The author showed this process through the prism of three stages: creation of the structure and transformation of medical universities activity on the basis of European democracy (1990-2005); content and procedural transformation of medical education (2005-2011); its modernisation through the transition to European standards (2011-2015) [24].

The increase in knowledge of medical polonistics is reflected in numerous scientific articles that reveal the peculiarities of the formation of the Polish model of European medical education (N. Dzhavadova, T. Kovalchuk, B. Pereviznyk) as well as the experience and innovative methods of organising the educational process in higher medical education institutions in Poland (A. Bedeniuk, T. Bodnar, A. Dorofeev, T. Myahkova, V. Khorostovska, etc.).

The dissertation defended in Ukraine by a Polish researcher P.-B. Uliash on the impact of relations between Poland and Ukraine on the development of higher medical education and science in these countries in the XIII – early XX centuries deserves special mention. Unlike Ukrainian studies that focus on contemporary processes, the author showed the stages and factors of the creation of medical institutions, their borrowing of European experience, the spread of Polish influence from the western parts of Ukraine to the eastern ones, etc. in a retrospective of seven centuries [25]. This study confirms that over the centuries, medical education in Ukraine has been developing in line with the European educational space, so under current conditions it is not 'entering' [for the first time], but rather 'returning' to it.

The concept of the continuity of medical education is a central theme in the studies of the development of medical education abroad. In the current historiographical situation, the monograph "The System of Continuous Medical Education" (1994) is still relevant, in which, based on extensive factual material, the authors gave a detailed description and compared the peculiarities of its development in Europe, Central and South America, and India [26]. In the absence of other significant works on this issue, we note the dissertation of N. Belousova (2021), which described the professional training of medical representatives of pharmaceutical companies in Germany as an original

model of continuing education development. In this context, the organisational, legal, and didactic support for pharmacists' advanced training is analysed and the experience of solving this problem across the EU countries is compared [27].

At the beginning of the XXI century, the study of nursing education gained momentum in Ukraine. An important role in this is played by the scientific and practical journal 'Nursing' published by Ternopil National Medical University. Its first issue in 2006 alone contained two dozen articles on European standards and the American experience of its development. Among the comprehensive studies on this issue, K. Picon's thesis (2021) on the training of nursing specialists in the US tiered education system is worth mentioning. Having shown a century-long retrospective of its formation and the complexity of the modern organisational structure, the author described the specifics of nursing training at different levels of higher education (junior specialist, bachelor's, master's, doctoral degrees in nursing) and presented a comprehensive model for comparing nursing training systems in the USA and other countries [28].

Given that Ukraine is in a state of war and the prospects for post-war development, the study of foreign experience in the organisation of military medical education is of particular importance. The need for a profound understanding of this problem is evidenced by the works of I. Honcharenko, B. Klishevych, and V. Furdyk on its development in developed countries, in particular, in NATO.

CONCLUSIONS

The developed meta-analysis programme made it possible to identify and cover with a systematic structured analysis a significant array of various works of Ukrainian researchers on the development of medical education abroad accumulated in the 90s of XX – the first quarter of XXI century. The findings of the study revealed that the historiography of the problem mentioned above has a pronounced interdisciplinary, multi-level, profile-oriented character. The analysis of the dynamics of scientific knowledge accumulation has shown that under the influence of European integration processes, scholars have moved away from studying foreign experience of medical education development through the prism of its use in Ukraine and have begun to study its national systems as a separate subject. Despite the increase in the total number of studies, their country studies vector remains rather narrow, focusing on the United States and a number of European countries. Researchers have made significant progress in studying the main trends in the development of

national medical education systems, related to the decentralisation of its management, strengthening of university autonomy and requirements for professional selection of applicants, etc. We believe that the

presented Ukrainian perspective on the development of medical education abroad can become the basis for its comparison with the corresponding research of scientists from other countries.

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CONFLICT OF INTEREST

The Authors declare no conflict of interest

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