

Comparison of Nursing Curricula in Croatia and Turkey: Analysis Using the SPICES Model

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Abstract

Introduction. The SPICES model promotes a modern educational framework through Student-centered learning, Problem-based learning, Integrated teaching, Community-based education, Elective studies, and Systematic approaches. This model is pivotal for adapting nursing education to evolving global healthcare demands.

Aim. To perform a comparative analysis of the nursing curricula in the Republic of Croatia and the Republic of Turkey using the SPICES model.

Methods. A cross-national comparative study focusing on the undergraduate nursing programs at designated universities in Croatia and Turkey. Official curriculum documents, course descriptions, and relevant literature from both countries were collected and analyzed according to the six domains of the SPICES model. A comparative table was constructed to elucidate the adherence to and deviations from the model in each curriculum.

Results. Both countries' curricula reflect elements of the SPICES model, but are predominantly influenced by traditional educational practices. The Croatian curriculum shows greater interdisciplinary integration, in line with EU directives, whereas Turkey's curriculum is progressing towards better compliance with international standards through ongoing accreditation efforts. Variations were particularly noted in the extent of elective course offerings and problem-based learning applications. **Conclusions.** The study concludes that updating the nursing curricula in Croatia and Turkey to more closely follow the SPICES model could significantly improve the quality of nursing education. Such enhancements are likely to equip nursing professionals with better skills and knowledge, ultimately leading to improved patient care outcomes. The anticipated further accreditation in Turkey could foster the adoption of innovative educational strategies in line with the SPICES model.

Introduction

The quality of nursing care is directly connected to the quality of nursing education. Research shows that robust educational programs are essential for preparing nurses to effectively manage the complexities of modern healthcare (1). It is crucial that nursing curricula remain dynamic, incorporating current knowledge and technologies to develop professionals who are competent and equipped to lead improvements in healthcare practices (2). As such, it is crucial to develop curricula that equip nurses with the necessary skills, knowledge, and attitudes to effectively contribute to healthcare improvement (3). Nursing education curricula must cover essential areas, including foundational medical knowledge, clinical skills, patient care, communication, and ethical principles. A well-designed curriculum is a critical component in ensuring that nurses are not only able to provide high-quality care to their patients, but also continue to grow professionally. Moreover, the quality of a nursing curriculum significantly influences both the professional success of nurses and the overall quality of patient care (4). Research has shown that concept mapping can play a pivotal role in developing critical thinking among nursing students. A systematic review and meta-analysis conducted by Yue et al. indicates that concept mapping has a positive impact on both the affective dispositions and cognitive skills related to critical thinking in nursing education. However, further high-quality research is needed to comprehensively evaluate this method (5).

In light of rapidly changing global dynamics, significant shifts have occurred in societal structures, healthcare services, and nursing education. To keep pace with these developments, nursing education must remain dynamic and continually evolve. The COVID-19 pandemic has highlighted the need for flexibility and rapid adaptation in nursing education globally. As healthcare systems grappled with unprecedented demands, some countries implemented accelerated training programs for nurses to meet urgent workforce needs. To keep pace with these developments, nursing education must remain dynamic and continually evolve (6). Developing nursing curricula is an ongoing, iterative process that involves adapting existing activities and assignments, and at times requires a complete restructuring of the curriculum to ensure that it remains relevant and effective in addressing healthcare needs (7). The ongoing improvement, updating, and strengthening of nursing curricula are necessary to ensure the provision of advanced and high-quality nursing care. Studies that focus on curriculum revisions and updates play a pivotal role in educating gualified nurses who can meet the growing and diverse needs of the healthcare profession (8).

To create comprehensive nursing curricula, educational institutions must regularly assess various aspects of their programs. One effective method of such assessment is comparative studies. These studies examine the curricula of different countries, facilitating scholarly exchanges and enabling the localization of findings to improve existing programs or develop new ones. The insights gained from comparative studies also provide valuable guidance for those designing and implementing nursing curricula, helping to ensure that these programs are aligned with the specific healthcare needs of society (9,10). The selection of Croatia and Turkey for this comparative analysis stems from their active involvement in the Erasmus program, which encompasses not only nursing students but also faculty members. This participation facilitates educational exchanges that provide a rich context for evaluating and understanding the nuances of nursing education across different regulatory and cultural landscapes.

The SPICES model, which stands for Student-centered learning, Problem-based learning, Integrated teaching, Community-based education, Elective studies, and Systematic approaches, offers a modern framework essential for adapting nursing education to global healthcare demands. This model promotes a flexible, engaging, and holistic educational approach crucial in preparing nursing students to face contemporary health challenges (11). In Turkey, programs like those at Yozgat Bozok University are designed to balance theoretical knowledge with practical applications. Croatian nursing programs, exemplified by the University of Applied Health Sciences Zagreb, adhere to a standardized core curriculum set by the Ministry of Education, in line with EU directives, to ensure consistent and high-quality education that prepares students for professional practice within and beyond Croatia.

Although several comparative studies in the literature focus on nursing curricula, most involve comparisons between Iran and other countries (9,12). However, a comparison between Croatia, a member of the European Union, and Turkey, a country that serves as a bridge between the Middle East and Europe, offers a unique opportunity to explore the differing approaches to nursing education in these two regions.

Aim

This study aims to conduct a comparative analysis of the nursing curricula in the Republic of Croatia and the Republic of Turkey, with the aim of identifying key differences and similarities that can inform future curriculum development.

Methods

Study design

This study employed a descriptive-comparative design, guided by the SPICES model, to compare the nursing curricula of undergraduate nursing programs in the Republic of Croatia and the Republic of Turkey. In Croatia, the undergraduate nursing program follows a standardized core curriculum set by the Ministry of Education and implemented nationwide. This provides a basis for comparison with the nursing curriculum in Turkey, allowing for an examination of how each system addresses the challenges of modern healthcare education. The SPICES model emphasizes six key domains: Student-centered learning, Problem-based learning, Integrated or inter-professional teaching, Community-based education, Elective studies, and a Systematic or planned approach (11). This model served as the conceptual framework for the comparison between the two educational systems.

Data collection

Data were obtained from official curriculum documents, course descriptions, and relevant academic literature from the University of Applied Health Sciences Zagreb in Croatia and Yozgat Bozok University in Turkey. The data collection process was structured to identify and extract information related to the key components of each institution's nursing curriculum, with a particular focus on the six domains outlined by the SPICES model.

Data analysis

The collected data were systematically analyzed and categorized according to the six domains of the SPIC-ES model. This analysis involved a detailed comparison of similarities and differences between the two curricula within each domain.

The courses included in this analysis were selected based on their alignment with specific elements of the SPICES model. Each course was categorized according to the educational strategies it most effectively exemplified, highlighting the degree to which each course adhered to the principles of student-centered learning, problem-based learning, integrated or inter-professional teaching, community-based education, elective studies, and a systematic approach.

The assessment of course alignment with the SPICES model was conducted by faculty members from both the University of Applied Health Sciences Zagreb in Croatia and Yozgat Bozok University in Turkey. Faculty members evaluated the courses with respect to their learning outcomes, content, teaching methods, and assessment criteria, ensuring that each course was appropriately classified according to the SPICES elements it best represented. The final step in the analysis involved interpreting the data to identify key points of convergence and divergence between the curricula.

Ethics

The study was conducted in accordance with the established ethical standards for educational research. Given that no personal or sensitive data were collected and the study was based solely on publicly available curriculum information, ethical approval was not required. The study did not involve human participants, ensuring compliance with ethical guidelines and the protection of personal data.

Results

The results of the comparative analysis are displayed in two tables. Table 1 summarizes the alignment of Yozgat Bozok University's courses with the SPICES model, categorizing courses under the headings of Student-centered Learning, Problem-based Learning, Integrated Teaching, Community-based Education, Elective Studies, and Systematic Approach. Table 2 presents information for the University of Applied Health Sciences Zagreb, showing how each course fits into the SPICES framework.

Student-based strategy

The student-based strategy, as one of the key components of the SPICES model, shifts the responsibility for learning to the student, fostering active learning. This approach contrasts with the traditional, teacher-centered model and promotes higher-order cognitive skills, including critical thinking. The five stages of the student-based strategy are as follows:

- Stage 1: The student follows a prescribed program with no consideration of individual needs or preferences.
- Stage 2: The course coordinator considers the students' needs and preferences during course planning but maintains the prescribed program.
- Stage 3: The course coordinator tailors courses based on both institutional preferences and student input, while students are responsible for implementing learning activities.

- Stage 4: Students actively participate in both planning and implementation phases of the curriculum.
- Stage 5: Students are involved in all stages, from planning and implementation to assessment (13).

At Yozgat Bozok University in Turkey, the curriculum remains largely educator-centered. Faculty members define learning objectives and course content, conveying theoretical knowledge through lectures and practical sessions. While students play an active role in clinical practice (particularly in case management and patient care planning), the overall learning process is still predominantly guided by instructors. Based on this structure, the Turkish curriculum aligns with Stage 2, where student preferences are considered, but the educational process remains largely predefined.

The University of Applied Health Sciences Zagreb in Croatia operates at Stage 2 of the student-based strategy. In Croatia, the curriculum complies with EU Directives 2005/36 and 2013/55, which mandate specific competencies for nursing graduates. While students have limited input on course content, they are expected to engage actively with learning materials, especially during clinical placements (14, 15).

Problem-based strategy

The problem-based strategy emphasizes solving real-life problems as a central aspect of learning. This approach promotes active learning, enabling students to apply theoretical knowledge in practical settings, thus fostering analytical and problem-solving skills. The five stages of problem-based learning are:

- Stage 1: General rules and concepts are taught without practical examples.
- Stage 2: Administrative rules are introduced, but there is no structured program for their application.
- Stage 3: The applied rules are introduced through examples or problem-solving exercises.
- Stage 4: Problem-solving becomes the focus of learning activities.
- Stage 5: Real-world problems are used to teach inferential rules and concepts (13).

In Turkey, problem-based learning is not systematically applied across the curriculum. However, in key

Table 1. Classification of activities in Yozgat Bozok University, Turkey, according to SPICES model									
Institution	Student- centred learning	Problem- based learning	Integrated or inter- professional teaching	Community based education	Elective studies	Systematic or planned approach			
University of Yozgat Bozok, Yozgat, Turkey	Evaluation of health I, Evaluation of health II, Fundamentals of nursing, Internal medical nursing, Surgical medical nursing, Nursing in obstetrics and gynaecology, Paediatric Health and Disease Nursing, Psychiatric Nursing, Public health nursing, Nursing management, Nursing practice I: internal diseases nursing, Nursing practice II: surgical diseases nursing, Nursing practice III: obstetrics, women's health, and diseases, nursing, Nursing practice IV: paediatric health and disease nursing, Nursing practice V: Psychiatric Nursing, Pratice V: Psychiatric Nursing, Nursing practice VI: public health nursing, Pain Management Nursing, Protecting and improving health, Turkish language I, Turkish language I (English I, Professional English I, Profesginal English I, Profesginal English I, Foreign language I (English), Foreign language I (English), Foreign language I	Research in nursing, First aid and emergency care, Teaching in nursing, Safe Medication Practices, Emergency nursing Pain Management Nursing, Diayaster nursing, Intensive care nursing, Intensive care nursing, Intensive care nursing, Intensive care nursing, Intensive care nursing, Nursing management of chronic diseases in disasters, Ostomy and wound care, Nursing occupational, Health nursing, Forensic nursing, Palliative nursing care, Geriatric nursing care, Technology Nursing, Nursing Informatics, Nursing process, Reproductive health nursing	Principles of Atatürk and history of revolution I, Psychology, Basic computer Technologies, Anatomy, Histology, Physiology, Biochemistry, Physical education I, Fundamentals of cyber security, Foreign language I (English), Principles of Atatürk and history of revolution II, Microbiology- Parasitology, Career planning, Pathology, Physical Education II, Nutrition, Foreign Language II (English), Elective course outside the field I, Professional English I, Biostatistics, Elective course outside the field II, Self-awareness and communication methods, Infectious diseases, Complementary and Alternative Therapies, Symptom management, Physical examination, Protecting and improving health	Individual audit collection methods, Nutrition of public health, Ethics and deontology in nursing, Health sociology, Epidemiology, Transcultural nursing, Nursing and family, Gender and health, Home care nursing, Rehabilitation nursing, Occupational health nursing, Protecting and improving health, Public health nursing, Nursing management, Evaluation of health I, Evaluation of health II, Fundamentals of nursing, Internal diseases nursing, Surgical diseases nursing, Obstetrics and gynaecology Nursing, Paediatric health and disease nursing, Public health nursing, Nursing management, Nursing practice I: Internal medical nursing, Nursing practice II: surgical diseases nursing, Nursing practice II: obstetrics, women's health, and diseases, Nursing Practice IV: Paediatric health and diseases nursing, Nursing practice V: Paediatric health and diseases nursing, Nursing practice V: Paediatric health and diseases nursing, Nursing practice V: Public health nursing, Nursing practice V: Psychiatric nursing, Nursing practice V: Public health nursing	Innovation in nursing, Pain Management Nursing, Complementary and alternative therapies, Disaster nursing, Approach to disabled individual, Intensive care nursing, Ostomy and wound care nursing, Evidence- based nursing, Professionalism in nursing, Reproductive health nursing	Adolescent and problem behaviors, Child and culture, Child values and communication with the child, Pain management nursing, Diaysis nursing, Disaster nursing, Jisaster nursing, Symptom management, Paediatric emergencies, Management of chronic diseases in disasters, Newborn nursing, Home care nursing, Psychiatric nursing, Respective sed nursing, Evaluation of health I, Evaluation of health I, Evaluation of health II Fundamentals of nursing, Internal medical nursing, Surgical diseases nursing, Paediatric health and diseases nursing, Psychiatric health and diseases nursing, Psychiatric health nursing, Public health nursing, Nursing management, Nursing practice I: internal diseases nursing, Nursing practice II: surgical diseases nursing, Nursing practice II: obstetrics, women's health, and diseases nursing, Nursing practice IV: child health and diseases nursing, Nursing practice V: Psychiatric health and diseases nursing, Nursing practice VI: public health nursing, Nursing practice VI: Psychiatric health and diseases nursing, Nursing practice VI: public health nursing, Nursing practice VI: Psychiatric health and diseases nursing, Nursing practice VI: public health nursing,			

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Intensive care Nursing, Physical examination, Evidence-based nursing, Protecting and improving health

Table 2. Classification of activities in University of Applied Health Sciences Zagreb, Croatia, according to SPICES model									
Institution	Student- centred learning	Problem- based learning	Integrated or inter- professional teaching	Community based education	Elective studies	Systematic or planned approach			
University of Applied Health Sciences, Zagreb, Croatia	Fundamentals of nursing care Nursing process Clinical nursing practice 1 Communication skills Interpersonal relationships in nursing Professional development in nursing Basic emergency medical procedures Evidence-based nursing care Clinical nursing practice 2 Child nursing care Maternal and newborn nursing care of neurological patients Adult nursing care 1 Citing and referencing in academic writing for health studies students Fundamentals of clinical transfusion medicine Prevention in dental medicine Natural nutrition - breastfeeding Nursing and public media Pain management Mental health protection for children and adolescents Intensive care nursing for children Nursing care of chronically ill children Oncology nursing care Clinical nursing care Adult nursing ractice 3 Fundamentals of nursing research Pallitäve unrsing care Adult nursing care Geriatric nursing care Geriatic nursing care Geriatic nursing care Geriatic nursing care Socially beneficial learning Emergency situations in psychiatry Croatian sign language Family nursing care Technology in nursing practice Nursing care for addicts Diagnostic nursing care	Nursing process Patient safety in healthcare institutions Teamwork in nursing Evidence-based nursing Care Basic emergency medical procedures Communication skills Organization, management, and administration in nursing Nursing and public media Social psychology in healthcare Pain management Mental health protection for children and adolescents Sociology of health Health Psychology Fundamentals of nursing research Palliative nursing care Health education with methods of teaching and learning Nursing care for people with disabilities Psychiatric nursing care Nursing care for people with disabilities Psychiatric nursing care Service learning Emergency situations in psychiatry Nursing care for addicts Nursing care of school- aged children	Anatomy Dietetics Pharmacology Philosophy and ethics in nursing Physiology Informatics in nursing Communication skills Microbiology with parasitology Fundamentals of physics, radiology, and radiation protection Fundamentals of medical chemistry and biochemistry Social and health legislation Lifespan psychology Foreign language Fundamentals of nursing care Nursing process Clinical nursing practice 1 Dermatology Gynaecology and obstetrics Hygiene and epidemiology Infectology Infectology Uniternal and newborn nursing care of neurological patients Adult nursing care 1 Clinical nursing practice 2 Organization, management, and administration in nursing Pathology Pathology Pathology Social psychology Social psychology Social psychology Health psychology Social psychology Social psychology Social psychology Social psychology Fundamentals of nursing Pathology Pathology Pathology Pathology Pathology Social psychology Social psychology Fundamentals of nursing Psychiatry ard mental health Nursing care for people with disabilities Psychiatric nursing care Community nursing care Surgero y situations in psychiatry Family nursing care Nursing care for people with disabilities Psychiatric nursing care Nursing care for people with disabilities Psychiatry ramily nursing care Nursing care for people with disabilities Psychiatry ramily nursing care Nursing care or addicts Nursing care	Philosophy and ethics in nursing Fundamentals of nursing care Nursing process Professional development in nursing Lifespan psychology Hygiene and epidemiology Infectology Infectology Internal medicine Public health Health sociology Child nursing care Maternal and newborn nursing care of neurological patients Adult nursing care Health psychology Prevention in dental medicine Natural nutrition - breastfeeding Oncology nursing care Health education with methods of teaching and learning Adult nursing care II Psychiatric nursing care Geriatric nursing care Emergency situations in psychiatry Croatian sign language Family nursing care Nursing care for addicts Nursing care of school- aged children	Patient safety in healthcare institutions Interpersonal relationships English language German language Professional development in nursing Basic emergency medical procedures Lifespan psychology Teamwork in nursing Evidence-based nursing care Citing and referencing in academic writing for health studies students Basic clinical transfusion medicine Prevention in dental medicine Natural nutrition- breastfeeding Nursing and public media Social psychology in healthcare Pain management Mental health protection for children and adolescents Intensive care nursing for children Nursing care of a chronically ill children Oncology nursing care Service learning Emergency psychiatry Croatian sign language Family nursing care Technology in nursing practice Nursing care in explantation/ transplantation/ transplantation Intensive care unit nursing Nursing care of school- aged children Nursing care of the neurosurgical patients	Fundamentals of nursing care Nursing process Clinical nursing practice 1 Patient safety in healthcare institutions Basic emergency medical procedures Teamwork in nursing Evidence-based nursing care Child nursing care Maternal and newborn nursing care of neurological patients Adult nursing care 1 Clinical nursing practice 2 Organization, management, and administration in nursing Health psychology Fundamentals of clinical transfusion medicine Pain management Mental health protection for children and adolescents Intensive care nursing for children Nursing care of chronically ill children Oncology nursing care Clinical nursing practice 3 Thesis Adult nursing care II Geriatric nursing care Nursing care for people with disabilities Psychiatric nursing care Nursing care for people with disabilities Psychiatry Croatian sign language Family nursing care Nursing care in explantation/ transplantation/ Intensive care of school- aged children			

professional courses, such as obstetrics, psychiatric health, and paediatric nursing, problem-solving methods are occasionally employed in small group settings. The Turkish curriculum aligns with Stage 2, where administrative rules are taught, but no structured problem-solving program exists.

In contrast, the University of Applied Health Sciences Zagreb in Croatia employs problem-based learning at Stage 3. Real-life examples and problems are integrated into the curriculum, particularly in clinical courses, allowing students to apply theoretical knowledge to practical situations. This approach enhances critical thinking and problem-solving abilities, preparing students for real-world nursing challenges.

Integration strategy

The integration strategy in the SPICES model seeks to connect different educational content, promoting coherence and a deeper understanding of the material. This can be achieved through horizontal integration (linking related disciplines) and vertical integration (connecting theoretical knowledge with practical application). The five stages of integration are:

- Stage 1: Courses are independent in terms of objectives, content, instructors, and methods.
- Stage 2: Coordination exists between related courses, with instructors sharing information and consulting with each other.
- Stage 3: Temporary or continuous coordination is achieved, integrating content and assessment across disciplines.
- Stage 4: Boundaries between disciplines begin to blur, with multidisciplinary courses implemented.
- Stage 5: Interdisciplinary and multidisciplinary courses are fully integrated into the curriculum (13).

At Yozgat Bozok University in Turkey, courses are delivered independently, with little horizontal or vertical integration. Students follow a curriculum designed independently by the Nursing Department, with input from internal and external stakeholders. The curriculum is largely organized by semester, and students must complete at least two out-of-field courses. Clinical practice is conducted under the supervision of instructors, and students complete a year-long internship following their three-year coursework. The Turkish curriculum aligns with Stage 1 of the integration strategy, where courses remain distinct in terms of objectives, content, and teaching methods.

At the University of Applied Health Sciences Zagreb in Croatia, the integration strategy aligns with Stage 2. Here, courses are coordinated to ensure students understand how different subjects interrelate. Although there is no full integration of content across disciplines, efforts are made to highlight the connections between related subjects, such as anatomy and physiology, enhancing the overall learning experience.

Community-based education strategy

The community-based education strategy integrates theoretical knowledge with practical experiences in community settings, helping students address real health problems. This strategy encourages students to engage with local populations, fostering creativity and critical thinking about public health issues. The five stages of community-based education are:

- Stage 1: Courses are unrelated to community problems.
- Stage 2: Courses focus on third-level care (hospital-based).
- Stage 3: Courses emphasize sociology and community issues.
- Stage 4: Courses are community-based, with real-world application of knowledge.
- Stage 5: Courses are integrated across disciplines, with community engagement at the core of learning (13).

In Turkey, community-based education is incorporated through courses such as community health nursing, transcultural nursing, and health sociology. Students gain practical experience in primary family health centers and schools, contributing to public health during clinical rotations. Turkey's curriculum aligns with Stage 3, where courses emphasize sociology and community health issues.

In Croatia, community-based education is implemented at Stage 4, with a strong focus on real-world applications. Students participate in clinical rotations in community health centres and engage in public health initiatives, linking theoretical knowledge with practical outcomes. The curriculum ensures students are well-prepared to address the health needs of local populations.

Elective strategy

The elective strategy allows students to tailor their education by selecting courses that align with their personal interests and professional goals. The five stages of the elective strategy are:

- Stage 1: All courses are compulsory.
- Stage 2: Students can select certain aspects, such as consultants or exam schedules.
- Stage 3: Students have additional choices in examination content.
- Stage 4: Certain topics and assessment methods are elective.
- Stage 5: Students choose their learning methods (13).

In Turkey, 33.3% of the courses are elective, with the remaining curriculum consisting of compulsory courses. Students' feedback is incorporated into curriculum updates. Based on this structure, Turkey is aligned with Stage 1, where most courses are compulsory.

At the University of Applied Health Sciences Zagreb in Croatia, the curriculum corresponds to Stage 2. Students have the option to choose from a range of elective courses, such as teamwork in nursing and oncology nursing, which allow them to specialize in areas of interest while completing a largely predetermined program.

Systematic strategy

The systematic strategy involves a structured and planned educational approach, ensuring that course objectives, content, teaching methods, and assessments are clearly defined. The six stages of systematic strategy include:

- Stage 1: Course information (objectives, content, methods, and assessment) is inaccessible to students.
- Stage 2: Course information is provided to students.
- Stage 3: Course content and assessments are directly linked to objectives.
- Stage 4: Objectives are tailored to assessment needs.
- Stage 5: Continuous assessment and feedback are provided (13).

In Turkey, nursing education starts after a competitive university entrance exam. Students are vaccinated and evaluated for health conditions before starting clinical practice. The curriculum is structured, but course information is clearly communicated to students. Turkey's curriculum aligns with Stage 2 of the systematic strategy.

In Croatia, the curriculum is at Stage 3, with clear alignment between course content, learning outcomes, and assessment methods. The national accreditation agency regularly evaluates nursing programs, ensuring compliance with ESG standards and further enhancing the quality of education (16).

Discussion

This study aimed to compare the nursing curricula at the University of Applied Health Sciences Zagreb in Croatia and Yozgat Bozok University in Turkey using the SPICES model as a framework for analysis. The SPICES model, originally developed over 30 years ago, remains highly relevant today, particularly in contexts where curriculum reform is needed or where innovative approaches to teaching and learning are being introduced. The model continues to be regarded as one of the most valid educational strategies for both developing new educational programs and revising existing ones (17 - 20).

Research by Navab et al. (2019) underscores the importance of adapting nursing curricula to meet the evolving needs of communities, drawing on the successful experiences of leading nursing schools that have implemented the SPICES model (21). Such adaptations help ensure that nursing education remains responsive to societal needs, particularly in preparing future nurses to meet the challenges of contemporary healthcare. Globalization has significantly influenced the nursing profession by impacting areas such as nursing development, migration, and specialization. This shift necessitates that nursing curricula address global health challenges and prepare nurses for roles that transcend national boundaries. As highlighted in recent literature, globalization brings both advancements in nursing practice and challenges, including ethical considerations and the need for cultural competence in patient care (22).

A comparative study conducted on the implementation of the SPICES model in the nursing curricula of Tehran (Iran), West (Canada), and Hacettepe (Turkey) universities highlights significant differences in how the model is applied across regions. The findings suggest that the West Nursing Faculty in Canada has more successfully implemented the model compared to the Iranian and Turkish institutions (23). These results highlight the potential for improvement in the application of the SPICES model in countries like Turkey and Iran.

The comparison of the two nursing curricula revealed that while both countries are making efforts to align their nursing education with the SPICES framework, significant differences remain in how these educational strategies are implemented.

An internationally educated and professional nursing workforce is crucial for achieving positive health outcomes. Despite global efforts to improve nursing education, substantial diversity remains in educational standards both within and across countries (24). In response, an international framework of guidelines has been developed to enhance consistency and quality in nursing education worldwide, as highlighted by the World Health Organization's State of the World's Nursing 2020 report (25) This framework promotes three core pillars: standardized learning outcomes for nursing graduates, program standards, and institutional standards, while allowing adaptability to local socio-cultural contexts. Global standards in nursing education, such as those promoted by WHO, are crucial for reducing disparities in healthcare quality across different regions. These standards ensure that nursing curricula are not only responsive to local healthcare needs but also aligned with best practices in nursing education worldwide, thereby fostering an internationally competent nursing workforce. The framework's flexibility supports the integration of globally informed best practices into locally relevant curricula, which could be beneficial for countries like Croatia and Turkey as they aim to improve and harmonize their nursing education systems. In Croatia, compliance with EU Directives 2005/36 and 2013/55 plays a critical role in ensuring that nursing education adheres to European standards. This alignment leads to a more structured and standardized curriculum with clear expectations for both educators and students (14, 15). On the other hand, Turkey, despite adopting the SPICES model through its national accreditation process, still faces challenges in fully integrating certain SPICES strategies, particularly in fostering problem-based learning and student-centered education. Study by Hong and Yu demonstrated that the implementation of unfolding case-based learning in lectures significantly improves nursing students' critical thinking abilities (26). These findings suggest that integrating such innovative approaches into current curricula, especially in Turkey, where traditional methods still dominate, could enhance the development of critical thinking and decision-making skills.

One of the key findings is that Turkey remains largely at Stage 2 of both the student-based and problembased strategies, where student preferences are considered but the curriculum remains predominantly predetermined and guided by faculty members. In contrast, Croatia demonstrates a more integrated approach, especially in clinical settings where students are encouraged to apply theoretical knowledge in real-world environments. However, even in Croatia, opportunities for greater student involvement in curriculum design and decision-making could further enhance the educational experience.

The differences in how these curricula align with the SPICES model have direct implications for nursing practice in both countries. In Croatia, the focus on community-based education and integrated teaching ensures that students are better prepared to address public health challenges and work in interdisciplinary teams. This approach is likely to result in nurses who are more adaptable and capable of applying their skills in diverse healthcare settings. On the other hand, Turkey's emphasis on traditional, instructor-led teaching may limit the development of critical thinking and problem-solving skills in nursing students, which are crucial for handling complex patient care scenarios.

As more nursing programs in Turkey undergo accreditation and move towards higher stages of the SPIC-ES model, it is expected that the quality of nursing education will improve, leading to better-prepared healthcare professionals. A recent comparative study on midwifery students in Ethiopia provides empirical support for the effectiveness of the SPICES model in enhancing clinical reasoning. The study found that students educated under the SPICES framework showed significantly better clinical reasoning skills, as measured by the Script Concordance Test (SCT), compared to those trained in traditional curricula. These findings suggest that implementing a SPICES- based approach may lead to improvements in critical skills necessary for complex patient care, highlighting the model's potential for broader application in nursing education worldwide (27). The SPICES model's focus on problem-based and student-centered strategies not only aligns with contemporary educational best practices but also promotes lifelong learning, which is essential for adapting to advancements in healthcare. By encouraging active involvement and critical thinking, this model prepares students to tackle complex, real-world challenges they may encounter in diverse healthcare settings. The shift towards active learning and student involvement in the educational process, as promoted by the SPICES model, will likely result in nurses who are more engaged in their learning and more capable of meeting the demands of modern healthcare. Future research could further explore the application of the SPICES model in nursing education across diverse cultural and institutional contexts. Comparative studies involving additional countries would provide a broader understanding of how educational strategies, such as student-centered learning and problem-based education, influence nursing competencies globally.

Limitations

There are several limitations to this study that should be considered when interpreting the results. First, the analysis was limited to two universities - Yozgat Bozok University in Turkey and the University of Applied Health Sciences Zagreb in Croatia - thus restricting the generalizability of the findings. A broader study that includes more universities from both countries would provide a more comprehensive understanding of how the SPICES model is implemented across different institutions. Additionally, the study relied on publicly available curriculum documents and did not involve direct observation or qualitative interviews with faculty members or students. Another limitation is the potential cultural differences between the two countries, which may influence how certain educational strategies are implemented. For example, the emphasis on problem-based learning may differ significantly based on cultural expectations of teaching and learning, as well as the healthcare challenges unique to each country.

Conclusion

This study provides a comparative analysis of the nursing curricula at the University of Applied Health Sciences Zagreb in Croatia and Yozgat Bozok University in Turkey using the SPICES model as a framework. The results highlight both similarities and differences in how the SPICES strategies are implemented in Croatia and Turkey, with Croatia demonstrating a more structured and EU-aligned approach, while Turkey is in the process of improving its curriculum through accreditation and alignment with international standards. Despite both countries making efforts to modernize nursing education, challenges remain, particularly in the areas of problem-based learning and student-centered approaches, which are more prevalent in Croatia. The findings suggest that further efforts are needed, particularly in Turkey, to fully implement the SPICES model to foster active learning and critical thinking, essential for modern nursing practice.

The study emphasizes the importance of continuously updating nursing curricula in response to evolving healthcare needs. By aligning more closely with the SPICES model, both countries can enhance the quality of nursing education, better preparing graduates to meet the demands of contemporary healthcare environments.

Author contributions

Conceptualization (SČ, RAH, BS, BF, BÜ); Data Curation (SČ, RAH, BS, BF, BÜ); Formal Analysis (SČ, RAH, BS, BF, BÜ); Investigation (SČ, RAH, BS, BF, BÜ); Methodology (SČ, RAH, BS, BF, BÜ); Project Administration (SČ, RAH, BS, BF, BÜ); Resources (SČ, RAH, BS, BF, BÜ); Supervision (SČ, RAH, BS, BF, BÜ); Validation (SČ, RAH, BS, BF, BÜ); Visualization (SČ, RAH, BS, BF, BÜ); Writing – Original Draft (SČ, RAH, BS, BF, BÜ); Writing – Review & Editing (SČ, RAH, BS, BF, BÜ).

Conflict of interest

The authors declare no conflicts of interest.

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References

- Yue M, Zhang M, Zhang C, Jin C. The effectiveness of concept mapping on development of critical thinking in nursing education: A systematic review and metaanalysis. Nurse Educ Today. 2017;52:87-94. https:// doi.org/10.1016/j.nedt.2017.02.018
- MacDonnell C, George P, Nimmagadda J, Brown S, Gremel K. A team-based practicum bringing together students across educational institutions and health professions. Am J Pharm Educ. 2016;80(3):49. https:// doi.org/10.5688/ajpe80349.
- MacDonnell C, George P, Nimmagadda J, Brown S, Gremel KA. Team-based practicum bringing together students across educational institutions and health professions. Am J Pharm Educ. 2016;80:49. https:// doi.org/10.5688/ajpe80349
- Wakefield M, Williams DR, Le Menestrel S. The future of nursing 2020-2030: Charting a path to achieve health equity. Washington, DC: National Academies Press; 2021. https://doi.org/10.17226/25982
- Yue M, Zhang M, Zhang C, Jin C. The effectiveness of concept mapping on development of critical thinking in nursing education: A systematic review and metaanalysis. Nurse Educ Today. 2017;52:87-94. https:// doi.org/10.1016/j.nedt.2017.02.018
- Dewart G, Corcoran L, Thirsk L, Petrovic K. Nursing education in a pandemic: Academic challenges in response to COVID-19. Nurse Educ Today. 2020;92:104471. https://doi.org/10.1016/j.nedt.2020.104471
- Williams PA. Fundamental Concepts and Skills for Nursing. 6th ed. St. Louis, Missouri: Elsevier Health Sciences; 2021.
- Yüceyurt NK, Şenyuva EA, Kaya H. Uluslararası ve Ulusal Çalışmaların Hemşirelik Eğitimine Yansımaları. Yükseköğretim ve Bilim Dergisi. 2023;13(1):1-9. https:// doi.org/10.5961/higheredusci.1163644 Turkish.
- Khorashadizadeh F, Karimi Moonaghi H. Systematic strategy in nursing curriculum in American, Canadian, Australian nursing and proposed way for applying it in Iranian nursing curriculum: A comparative study. J Med Educ Dev. 2017;12(1&2):2-12.
- 10. Karimi Moonaghi H, Khorashadizadeh F. Nursing curriculum in some developed countries and proposed way of applying it in the Iranian nursing curriculum: A comparative study. J Nurs Educ. 2015;4:38-47.
- 11. Harden RM, Sowden S, Dunn WR. Educational strategies in curriculum development: the SPICES model. Med Educ. 1984;18(4):284-97. https://doi. org/10.1111/j.1365-2923.1984.tb01024.x
- 12. Asgari P, Navab E, Bahramnezhad F. Comparative study of nursing curriculum in nursing faculties of Canada, Turkey, and Iran according to SPICES model. J Educ

Health Promot. 2019;8:120. https://doi.org/10.4103/ jehp.jehp_392_18

- Changiz TA. Course evaluation tool based on SPICES model, and its application to evaluation of medical pharmacology course. J Med Educ. 2006;8(2):111-20.
- 14. European Parliament & Council. Directive 2013/55/ EU amending Directive 2005/36/EC on the recognition of professional qualifications. Available at: https://eur-lex.europa.eu/legal-content/EN/ ALL/?uri=celex%3A32013L0055.
- 15. European Parliament & Council. Directive 2013/55/ EU amending Directive 2005/36/EC on the recognition of professional qualifications. Available at: https://eur-lex.europa.eu/legal-content/EN/ ALL/?uri=celex%3A32013L0055.
- European Association for Quality Assurance in Higher Education. Standards and guidelines for quality assurance in the European Higher Education Area (ESG). Brussels, Belgium; 2015. Available at: https://www. enqa.eu/wp-content/uploads/2015/11/ESG_2015.pdf.
- 17. Dent JA. Using the SPICES model to develop innovative teaching opportunities in ambulatory care venues. Korean J Med Educ. 2014;26(1):3. https://doi. org/10.3946/kjme.2014.26.1.3
- Karimian Z. Impact of innovative educational technologies on the SPICES model in medical education. Interdiscip J Virtual Learn Med Sci. 2023;14(1):75-9. https://doi.org/10.30476/ijvlms.2023.98690.1223
- Misganaw E, Yigzaw T, Tezera R, Gelitew A, Gedamu S. The promise of the new educational strategy for curriculum development (SPICES) model on the development of students' clinical reasoning ability. A comparative cross-sectional study. Adv Med Educ Pract. 2022;13:71-9. https://doi.org/10.2147/AMEP.S344933
- 20. Al-Jarshawi MHA, Al-Imam A. A thousand words about modern medical education: a mini-review concerning the theory of education. J Med Sci. 2022;91(2):124-8. https://doi.org/10.20883/medical.e636
- Navab E, Bahramnezhad F, Gholami M, Asgari P. Development of the proposed solutions to implement SPIC-ES model strategies in Iranian undergraduate nursing curriculum. J Med Educ. 2019;18(3):e105687. https:// doi.org/10.22037/jme.v18i3.25236
- Dorri S, Abedi A, Mohammadi N. Nursing education in the path of globalization: Promotion or challenge? Journal of education and health promotion. 2020;9(1):269. https://doi.org/10.4103/jehp. jehp_775_19
- Asgari P, Navab E, Bahramnezhad F. Comparative study of nursing curriculum in nursing faculties of Canada, Turkey, and Iran according to SPICES model. J Educ Health Promot. 2019;8(1):120. https://doi. org/10.4103/jehp.jehp_392_18
- Baker C, Cary AH, da Conceicao Bento M. Global standards for professional nursing education: The time is now. J Prof Nurs. 2021;37(1):86-92. https://doi. org/10.1016/j.profnurs.2020.10.001

- 25. World Health Organization. State of the world's nursing 2020: Investing in education, jobs and leadership [Internet]. Available at: https://iris.who.int/bitstream/ handle/10665/331677/9789240004863-ara.pdf
- 26. Hong S, Yu P. Comparison of the effectiveness of two styles of case-based learning implemented in lectures for developing nursing students' critical thinking ability: A randomized controlled trial. Int J Nurs Stud. 2017;68:16-24. https://doi.org/10.1016/j. ijnurstu.2016.12.008
- Misganaw E, Yigzaw T, Tezera R, Gelitew A, Gedamu S. The promise of the new educational strategy for curriculum development (SPICES) model on the development of students' clinical reasoning ability. A comparative cross-sectional study. Adv medical educ pract. 2022:71-9. https://doi.org/10.2147/AMEP.S344933