Review Article

Comparative study of master's degree curricula in nursing informatics at Tehran University of Medical Sciences and the University of Maryland

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Abstract

Background & Objective: As the healthcare landscape undergoes transformation and information technology and digital health continue to advance, the significance of nursing informatics has come to the forefront. This has emphasized the need to enhance the quality of the curriculum, required competencies, and to draw comparisons with successful programs globally. The study aimed to compare the master's curriculum in nursing informatics at Tehran University of Medical Sciences with that of the University of Maryland.

Materials & Methods: Conducted in 2022, this comparative study utilized the Bereday model across four stages: description, interpretation, juxtaposition, comparison. The University of Maryland was selected for comparison due to its global reputation as a leading institution in nursing informatics. The study encompassed an examination of the overall structure, curriculum, mission, professional roles, and admission conditions.

Results: The curricula of both universities exhibited substantial similarities in more than half of the cases. Consistencies were observed in mission-vision statements and student acceptance criteria. However, variations between the two institutions emerged in terms of class types, details regarding the number of courses, and the definition of professional roles.

Conclusion: Recognizing the critical role of nursing informatics training, suggested reforms to enhance professional roles, course content, and planning for flexibility, including diverse teaching methods both in non-attendance (e-learning) and face-to-face formats, can contribute to the enhancement of the curriculum in Tehran. Given the extensive history of this specialized field globally, there is a pressing need to enhance university education in nursing schools in Iran.

Keywords: nursing informatics, master degree, curriculum, information technology

Introduction

Nurses require comprehensive patient data and information to ensure safe and evidence-based care (1). Informatics nurses play a crucial role in analyzing and managing information systems across various contexts, enhancing health outcomes by maintaining high-quality data and transforming it into valid evidence (2). The teaching of 'nursing informatics' at the master's level commenced in the United States in the 1980s (3). The term 'nursing informatics' was officially defined in 1985 as 'the use of information technology in nursing tasks within the realms of management, clinical practice, and education' (2). In 1992, the American Nurses Association recognized nursing informatics as a nursing specialty. Subsequently, in 1994 and 1995, the association established the goals and standards for nursing informatics (4, 5). These standards were revised by the association in 2021 (6).

At present, nursing informatics offers the opportunity to acquire proficiency in the effective use of information technology for analyzing, modeling, collecting, and organizing information. This includes fostering knowledge-based decision-making and enhancing the quality of professional services provided by nurses (2). As the use of informatics continues to grow in improving

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the quality of care and ensuring patient safety, competence in this field has become an indispensable requirement for nurses (7).

The expansion of nursing informatics contributes to health promotion by facilitating early diagnosis, remote monitoring of chronic diseases, and improving access, decision-making, comparison, and evaluation based on valid and collected information (8). In developed countries, universities and hospitals have developed various training courses aimed at enhancing literacy and informatics skills among nurses. Notably, the University of Maryland, School of Nursing, stands out as the pioneer in offering master's degree programs in nursing informatics, solidifying its position as the oldest institution dedicated to training nurses in this field (9).

In Iran, the first undergraduate nursing academic program was established in 1965, followed by the launch of the master's program in 1976 and the doctoral program in 1994 (10). Despite substantial progress in medical sciences, Iran is still in the early stages of developing nursing informatics (11, 12).

The concerted efforts of researchers and nursing faculty members have been instrumental in shaping this specialized field within the nursing academic program. The curriculum developed by the Faculty of Nursing and Midwifery at Tehran University of Medical Sciences for the admission of foreign students into the master's program in nursing informatics received approval from the committee responsible for implementing and evaluating international curricula affiliated with the "Ministry of Health, Medical Education, and Medicine of Iran" in March 2022. Consequently, student recruitment commenced promptly (13). Another noteworthy curriculum was designed by Elahi and colleagues at Jundishapur University of Medical Sciences in Ahvaz in 2019 (8).

In terms of historical background, the existing curriculum at the Faculty of Nursing and Midwifery of Tehran University of Medical Sciences dates back to 2008. The first edition of the 'Designed Curriculum and Criteria for Nursing Informatics in Discontinuous Master's Degree' in 2009 underwent approval at the Center for Study and Development of Education of Tehran University of Medical Sciences. It was subsequently sent to the Postgraduate Education Center of the University. In 2014, the sub-committee for internationalization and implementation of training courses for foreign students utilized this academic program in compiling and approving the curriculum in English (14). Additionally, in 2016, the nursing informatics curriculum compilation committee of Tehran School of Nursing and Midwifery updated it and forwarded it to the Higher Council of Medical Sciences Planning of the Ministry of Health, Treatment, and Medical Education. However, it was not prioritized for implementation at that time.

Nevertheless, the competence of graduates in this discipline, along with the quality of education and its courses, poses a significant challenge in Iran. Considering that evidence suggests the importance of conducting comparative research on an academic program during its initial development stages, drawing insights from well-established and successful programs worldwide becomes crucial. Such comparative studies aid in identifying strengths and weaknesses, thereby facilitating quality improvement and curriculum enhancement (15).

Furthermore, these studies provide an opportunity to understand the vision, mission, and professional roles in other countries, enabling a simultaneous evaluation of Iran's educational system (16). Researchers have undertaken various studies with the aim of comparing Iran's nursing education with that of other countries. These studies reveal both similarities and differences in curricula, including course content and the definition of job opportunities based on goals and missions. As a result, these studies have provided valuable suggestions for curriculum improvement and reform in Iran (10, 17).

It's worth noting that the university of Maryland school of nursing (UMSON) stands as one of the oldest and largest nursing schools in the United States of America, founded in 1889. The school began offering postgraduate courses in 1955 (18). In 2021, the university secured the 22nd position among the best nursing schools for master's education and the 16th position for nursing doctorate education (19).

The School of Nursing at the University of Maryland initiated the training of students for a master's degree in nursing informatics in 1988, and this program continues to be offered to date (9).

Given the significance highlighted earlier regarding the importance of comparative studies, and considering the rich history and success of the University of Maryland School of Nursing in implementing the nursing informatics curriculum, alongside the acknowledgment of existing challenges, this study was undertaken with the objective of comparing the master's degree program in nursing informatics at Tehran University of Medical Sciences with that of the University of Maryland in the year 2022.

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Materials & Methods

Design and setting(s)

The current comparative study, conducted in 2022, employs the comparative approach—a recognized research method in both social sciences and educational systems (20). For this study, we utilized the Bereday model, a commonly used model for comparative studies that employs a structured four-step method: description, interpretation, juxtaposition, and comparison (21, 22).

From the multitude of nursing informatics academic programs worldwide, we employed a purpose-based sampling strategy. Specifically, we selected the curriculum of the University of Maryland for comparison with the nursing informatics curriculum of Tehran University of Medical Sciences. The criteria for choosing the University of Maryland included its extensive history and success in nursing informatics education.

Data collection methods

To collect data, an extensive search was conducted on the Internet using keywords such as Nursing, Nursing Informatics, Maryland, TUMS, Iran, Master of Science, and Curriculum. The search covered reputable academic databases including Web of Science, PubMed, and Google Scholar. Additionally, information was sought on the official websites of Tehran University of Medical Sciences (www.tums.ac.ir) and the University of Maryland (www.umaryland.edu).

Data analysis

Following the Bereday model, the description stage involved obtaining the latest edition of Tehran University of Medical Sciences' nursing informatics master's curriculum from the faculty's website (13). While conducting a web search at the University of Maryland, information on the curriculum, student manuals, and uploaded courses available on the university's website was gathered (23-25). Curriculum details at the University of Maryland, along with relevant articles, reports, and supplementary materials, were compiled. After translation into Farsi, the data were examined, and notes were recorded. To facilitate subsequent analysis in the upcoming stages, the data were organized as situational descriptions.

During the interpretation stage, the research team, alongside two professors from the Tehran School of Nursing and Midwifery who were part of the nursing informatics curriculum development team, conducted three face-to-face sessions and two online sessions. In these sessions, they reviewed and analyzed the content and curriculum components of both Tehran and Maryland schools.

Moving to the juxtaposition stage, the information gathered from previous stages was synthesized to create a framework for comparison. This facilitated the examination of similarities and differences, and comparable criteria were established.

In the comparison stage, the curricula were analyzed, with a focus on entry criteria, strengths, and weaknesses. The results were systematically collected, classified, and compared.

Results

The study's findings, including mission, perspective, professional roles and duties, expected qualifications of graduates, recruitment conditions, and the characteristics, structure, and number of credit courses of academic courses in the nursing informatics program at the studied universities, are presented in Tables 1 to 5. Notably, the results revealed that the nursing informatics master's program was introduced at the University of Maryland 34 years before Tehran (Table 1). Below, a brief discussion on the comparative analysis of the two curricula in the respective faculties is provided.

Table1. Definition and history of nursing informatics field in the studied universities

Criteria	Tehran	Maryland
Definition	Nursing informatics represents the seamless integration of information technology with nursing across education, management, clinical, and research domains. This dynamic field provides nurses with the opportunity to harness the power of information technology for analyzing, modeling, collecting, and organizing information. Through knowledge-based decision-making, nursing informatics not only enhances the effectiveness of healthcare services but also elevates the professionalism of nurses, ultimately contributing to improved patient care and healthcare outcomes.	Nursing informatics stands as a specialized field that seamlessly integrates nursing science, information management science, and analytical science. Its core focus is on identifying, defining, managing, and communicating data, information, knowledge, and wisdom within the realm of nursing practice. This dynamic discipline is dedicated to supporting nurses, clients, patients, the interprofessional healthcare team, and other stakeholders in effective decision-making across various roles, ultimately working towards achieving desired outcomes. Leveraging information structures, processes, and technology, nursing informatics plays a pivotal role in enhancing the quality of care delivery and contributing to the success of healthcare endeavors.
History	Since 2022	Since 1988

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Mission and Vision

In general, both curriculums exhibit similarities in their mission and vision. The Tehran curriculum aims to enhance nurses' informatics skills to improve the quality of nursing care across various facets of the nursing profession, detailing competencies in both general and specialized axes. The Maryland curriculum, drawing on its extensive history in training informatics nurses, outlines a mission to advance the use of informatics tools in education, research, health information technology policy, and application. The Maryland School provides a more established perspective and a brighter horizon compared to Tehran (Table 2).

Table 2. Comparison of mission and vision in the field of nursing informatics at the studied universities

Criteria	Tehran	Maryland
Mission	The objective of this program is to enhance nurses' proficiency in computer skills, deepen their understanding of informatics, and cultivate their competence in nursing informatics. The overarching goal is to elevate the quality of nursing care by seamlessly integrating information technology tools across all facets of the nursing profession. • General competencies encompass essential skills such as effective communication, critical thinking, problem-solving, and the adept utilization of informatics capacities in managerial and professional contexts. • Specific competencies focus on practical applications, including proficient use of computers in diagnosis, intervention, and outcome assessment in patient care. Additionally, the program aims to instill the ability to leverage informatics knowledge in recognizing its significance, understanding its limitations, and adeptly retrieving resources for evidence-based practice. Moreover, participants will develop informatics skills to actively engage in the process of selecting, evaluating, and utilizing systems for optimal healthcare outcomes.	Maryland's mission encompasses education, research, health information technology policy, and application. • Education: Graduates from the nursing informatics program are expected to possess essential knowledge and skills in contemporary health informatics practices. • Research: The School of Nursing at the University of Maryland actively encourages and supports research endeavors within the field of Nursing Informatics. • Health Information Technology Policymaking: Faculty members and students of the Nursing Informatics department collaborate with various professional, governmental, and non-governmental entities. Together, they utilize informatics resources to advocate for social policies, contribute to the development, and evaluate health information technology policies on local, national, and international levels. • Application: Professors and students in nursing informatics are encouraged to proficiently employ informatics tools. This is aimed at supporting evidence-based practices that enhance quality, safety, results, and overall performance in the healthcare sector.
Vision	The Faculty of Nursing and Midwifery at Tehran University of Medical Sciences (TUMS) will poised to provide a premier academic program in nursing informatics as a pioneer within the region. Its commitment to excellence in education and research will be underlined by a strategic focus on delivering informatics solutions aimed at optimizing the outcomes of nursing care (13).	The University of Maryland School of Nursing will be a prominent academic program in nursing informatics, gaining recognition for its outstanding educational initiatives and research endeavors in utilizing informatics solutions to enhance health outcomes. The University of Maryland School of Nursing (UMSON) will also establish itself as a national and international leader, garnering acclaim for its contributions to education, health information technology policies, research, and applications in the realm of health informatics (24).

Professional Role

The professional role in Tehran's curriculum is succinctly expressed in the four axes of education, management, research, and clinical practice. The main expected capabilities are detailed in computer skills, informatics knowledge, and informatics skills. In the Maryland curriculum, expected abilities in clinical informatics, health service application, public health, and research in nursing informatics are outlined, accompanied by titles of applied job opportunities. Professional roles and duties, along with expected abilities and skills, are intricately described across five different work areas, presenting a clear perspective for students (Table 3).

Acceptance Condition

Regarding student admission conditions, both academic programs share similarities. Individuals holding a bachelor's degree in nursing are eligible to participate in the master's degree program in nursing informatics (Table 4).

General Structure and Credit Courses

The academic programs at the University of Maryland encompass a master's degree in nursing informatics, a one-year short-term course leading to a degree in nursing informatics, a clinical doctorate in nursing informatics, and a doctorate in nursing informatics focused on creating new knowledge in health care. Graduates of the nursing master's program at Maryland, with various orientations, have the opportunity to further their studies in doctorate degrees. Maryland provides an additional training course for master's degree graduates to prepare for the Nursing Informatics Certification (ANCC) exam. The certificate, issued by the American Nursing Accreditation Center upon successful exam completion, is a valuable credential (26). Tehran's academic programs comprise a master's degree in nursing informatics and a short-term training course. The academic course for the master's program in nursing informatics in Iran spans 2 to 3 years, during which students must successfully complete 32-credit course. In the program, students are required to complete 4 research

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credits through a thesis (27). Please refer to Table 5 for detailed information on credit distribution and course specifics. The short-term course is conducted in absentia, with a duration of either one month or two months.

Table 3. Comparison of professional roles, duties, and expected capabilities of nursing informatics graduates at the studied universities

Tehran	Maryland
Professional Duties In this academic program, as students acquire nursing informatics skills, they are guided to deliver effective services in the following fields through the utilization of information technology: • Education • Management • Research • Clinical Performance **Key Competencies and Skills Expected** ***1- Computer Skills:*** Utilizing computers as a nursing information management tool; Designing care plans, nursing diagnoses, interventions, and outcomes using computers; Safely utilizing the network, internet, and computers; Working with nursing databases and scientific resources Engaging with remote patient care and monitoring systems; Utilizing nursing information management tools for patient education; Proficiently using remote care and monitoring systems; Work with portable electronic systems; Searching and retrieving patient demographic information; Performing data entry for structured patient information ***2- Informatics Knowledge:*** Adopting the mindset of an informatics nurse; Recognizing the significance of data in nursing care; Acknowledging the limitations of computer design and capacity; Identifying the client's rights in managing computer information; Recognizing the limitations of computers for certain human activities; Exploring and utilizing new resources ethically in decision-making and evidence-based nursing; Supporting nurses' participation in selecting, implementing, and evaluating systems, emphasizing the implementation of information technology to enhance the quality of care; Understanding that computer use in nursing does not require programming mastery; Identifying human-computer interaction to enhance the quality of care ***3- Informatics Skills:*** Developing the use of informatics tools in quality assessment; Using informatics tools and databases for knowledge-based decisions to support patients; Encouraging other nurses to participate and accept information technology tools; Participating in the process of selecting, designing, implementing, and evaluating nursing systems; Recommending new and useful clinical nursing systems	**1- Clinical Informatics** Informatics nurses possess the ability to enhance patient care, alleviate executive burdens, and strengthen communication within interdisciplinary teams. Practical job titles in the clinical field for an informatics specialist nurse include: • Systems Analyst • Analyst Support • Systems Manager • Director of Information Technology Training • Project Manager • Project Leader • Chief Information Officer **2- Health Informatics of the Service Applicant** Nurses engaged in patient health informatics focus on the following activities: Assessing the information and treatment needs of the service applicant; Conducting research on meeting the health information needs of service applicants and self-management; Integrating the needs and preferences of service applicants into information systems; Developing and improving systems: • ***Telenursing:*** Providing remote nursing care, including answering questions and offering advice through messaging systems • ***Telehealth*****:** Promoting health through interactive training or self-management systems to monitor health behaviors and achieve goals • ***Remote monitoring:*** Transmitting patient information (such as blood sugar or daily weight) to healthcare providers for treatment decisions. **3- Health Education Informatics** Nurse informaticists focusing on education can develop, select, implement, and evaluate learning resources for service providers or healthcare professionals. **4- Public Health Informatics** The activities of public health informatics nurses revolve around education, producing and providing access to information and knowledge related to community health for service applicants, other healthcare workers, and policymakers. The emerging field of public health informatics addresses the information needs of policymakers and public health professionals using informatics principles at the community level. **5- Research in Nursing Informatics** The American Nurses Association recognizes research as one of the important duties of an informatics nurse. By using scientific and systematic methods to collect and analyze data, the informatics nurse can gradually generate knowledge applicable in various situations and diverse applications.

Table 4. Comparison of admission criteria and tuition fees for master's degree in nursing informatics at studied universities

Criteria	Tehran	Maryland
Admission Criteria	Prospective students must hold a valid bachelor's degree in nursing, obtained either domestically or internationally.	Prospective students are eligible for admission if they hold a Bachelor's degree in nursing from a recognized college or university and have achieved a cumulative grade point average (GPA) of at least 3.0 out of 4.0.
Tuition Fees	For the master's degree programs at medical sciences universities under the Ministry of Health, tuition fees will be waived for the regular program. However, students enrolled in the international program will be responsible for covering their tuition. Additionally, for the international program, students have the option to submit a scholarship request.	The expenses for nursing informatics training courses in Maryland are the responsibility of the student and are payable at the commencement of each semester. Additionally, there is an opportunity for students to apply for scholarships.

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Table 5. Comparison of characteristics and structure of nursing informatics master's degree programs in the studied universities

Criteria	Tehran University	University of Maryland
Duration (Course Length)	Full-time: 4 to 6 semesters	Full-time: 5 or 6 semesters, Part-time: 7 or 8 semesters
Form of Presentation	Face-to-face	Face-to-face, online
Number of Course Credits	32 credit courses, including 23 academic courses (20 Theoetical and 3 practical), 3 practicum and 6 thesis credits	40 credit courses, including 36 academic credits and 4 practicum credits
Credit Equivalency	Each theoretical credit courses: 17 hours, Each practical credit: 34 hours, Each practicum credit: 51 hours, Thesis credit: 34 hours	Each theoretical credit courses: 16 hours, Each practicum credit: 34 hours

Discussion

Despite similarities in the mission and vision of both curricula, there are notable differences. The mission of the University of Maryland is articulated across four axes, emphasizing educational backgrounds and job opportunities separately (24). In contrast, Tehran's mission places a strong emphasis on patient care and the clinical aspect (13). However, the details of Tehran's mission are less visible in the curriculum.

Significant differences are observed in the two curricula regarding professional roles and duties. Tehran's curriculum provides a relatively brief description of job duties, while Maryland's curriculum offers more detailed and practical insights, including clear job titles. While Tehran's curriculum lists qualifications, Maryland's curriculum establishes a more realistic connection between qualifications and job opportunities. Nurses who have completed a bachelor's degree are expected to possess fundamental computer skills for employment (28). Both curricula recognize the significance of computer and informatics skills aligned with nursing informatics competencies.

Comparing the admission criteria for the master's course in nursing informatics in both countries reveals a shared requirement—having a bachelor's degree in nursing. Recognizing nursing informatics as a science, there is a collective understanding of the necessity to integrate technology competencies alongside nursing care skills (8). This is reflected in the admission criterion of "Bachelor of Nursing graduates" in both Tehran and Maryland's curricula, ensuring students possess essential scientific and skill knowledge in nursing care.

The comparison of the general structure and presentation of courses in the two educational programs revealed a notable difference. The nursing informatics curriculum at the University of Maryland (as of May 2022) is offered in a non-attendance, full-time, and part-time format, providing flexibility for nurses to study while employed (25). Maryland's curriculum demonstrates increased flexibility by recently incorporating both face-to-face and virtual presentation methods, possibly reflecting adaptations in response to the challenges posed by the COVID-19 pandemic in 2022. It's important to note that the absence of specific guidelines for developing nursing informatics curriculum content and a lack of adherence to standards and criteria can hinder the process of developing qualifications in nursing education (29). Therefore, there is a need for increased attention to the distribution of credit courses and course headings in Iran to enhance the curriculum. With Tehran's curriculum having a total of 32-credit course (with 6 credit allocated to the thesis), 26-credit course encompass theoretical, practical, and practicum components. Achieving the expected perspectives, mission, and qualifications with this limited number of credit courses raises thoughtful considerations and requires adaptation. On the other hand, it's noteworthy that the total teaching hours in Tehran surpass those in Maryland and could potentially be streamlined.

A comparison of course titles and the number of educational courses reveals that the Tehran curriculum designates 4 credits for a research course, while Maryland assigns 6 credits. There may be room for adjustment and reduction in the number of thesis course in Tehran to align more closely with Maryland's structure.

In Tehran's curriculum, the courses “Economics and Nursing Management" and "Digital Entrepreneurship in Nursing" share content similarities with "Health Financial Management" and "Human-Technology Interaction in Healthcare" in the Maryland curriculum. To enhance adaptability and ensure comprehensive coverage of topics, these two Tehran courses can be merged under the title "Entrepreneurial Management in Nursing" valued at 2 credits.

Tehran's course "Nursing Management and Leadership" aligns with Maryland's courses "Managerial Health Finance" and "Organization Theory: Application in

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Health Services Management". Recognizing the overlap with the main course "Entrepreneurial Management in Nursing", duplicate topics in Tehran can be omitted for greater efficiency. This streamlining allows for a reduction in credit value by 2 under the title "Nursing Management and Leadership". Quality issues and ethical aspects can be seamlessly integrated into the course titles and content for comprehensive coverage.

Upon comparing the titles of specialized courses in Tehran and Maryland, the inclusion of the specialized courses "Information Technology Project Management in Nursing" and "Management and Analysis of Nursing Systems", each valued at 2 credits, could significantly enhance Tehran's curriculum.

In this scenario, the course "Nursing Care Database Systems: Analysis and Design" in Tehran's curriculum would be replaced, allowing for a more comprehensive coverage of relevant topics and aligning with contemporary needs in nursing informatics.

In Iranian universities, the completion of a thesis is a mandatory requirement for graduate education courses in nursing (27). However, allocating one-fifth of the course units (6 credits) to the thesis has restricted the inclusion of specialized credits related to nursing informatics. Considering that various master's degrees in nursing allocate 4 credits for the thesis as part of the research component (16), reducing the value of the thesis course from 6 to 4 credits could offer students an opportunity to acquire skills in other fields.

Examining the nature of practicum in nursing informatics coursework, it's beneficial for Tehran's practicum hours to align more closely with Maryland's practical approach of 34 hours. This adjustment would enhance the similarity between both curricula, particularly in the research dimension.

The results indicate that Maryland's nursing informatics master's practicum is more practical, flexible, and project-based. To enhance the quality of the Tehran course, it may benefit from aligning the practicum with a thesis and a project-based approach. Students could gather information from their practicum placements (such as hospitals, health centers, or companies) during flexible hours. This approach would allow them to provide insights into the current situation, identify strengths and weaknesses, and propose potential improvements, ultimately contributing to the development of a research program or a pilot study.

In the Tehran Faculty curriculum, course contents such as "Nursing Standards and Classification Systems" and "Information and Decision-Making Systems in Nursing" share content similarities with the Maryland curriculum. These can be consolidated into unified courses titled "Advanced Informatics Systems in Nursing", "Principles of Nursing Informatics", "E-learning", "Medical Information Systems", and "Quality Improvement".

These adjustments, along with modifications to existing courses, aim to enhance the overall content and relevance. However, given limitations in accessing comprehensive resources for Maryland's course details, there may be areas where further clarification is needed for a more accurate comparison.

Acknowledging the study limitations, it's highlighted that the presentation method (theory or practical) and the specified hours for each lesson in the University of Maryland's curriculum are not clearly defined, posing a challenge for a precise comparison. This limitation is consistent with findings in a similar study conducted in Iran (30). Additionally, the information gathered from the University of Maryland School of Nursing was obtained through the website, and complete resources for course details might not have been fully accessible, indicating a potential area for improvement in future studies.

Conclusion

The present study reveals both similarities and differences between the curricula of Tehran and Maryland. Notably, variations exist in the structure, presentation method, and the number of credit courses, impacting the definition of the professional role in each curriculum. Implementing reforms based on the comparative analysis and the identified areas in this study could enhance the quality of Tehran's curriculum.

Despite these differences, there are noteworthy similarities, particularly in the student acceptance criteria, mission, perspective, and the general definition of the professional role. However, Maryland's curriculum excels in providing a clearer expression of its mission, vision, and professional qualifications. While both curricula share many similarities in expected duties, Tehran's curriculum, although detailed in general and specialized qualifications, requires refinement in articulating the professional role and mission for improved clarity and precision. In light of the results from this comparison, the following suggestions can be proposed:

- Drawing inspiration from the University of Maryland's educational program, it is recommended that Tehran's thesis program be enriched by a more substantial engagement with the practicum course.

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- To enhance clarity regarding job positions for graduates, Tehran's program should articulate the professional role, consider available job opportunities, and align with country's policies and regulations.
- Given the rapid advancements in information technology and the expressed need for nursing informatics in various institutions, high-level nursing managers are urged to actively facilitate the establishment and growth of this field in different universities.
- Recognizing the importance of nursing informatics for working nurses, future studies should explore the feasibility and implementation of non-face-to-face programs, similar to the University of Maryland's approach.
- Given the dynamic nature of information technology, it is suggested to regularly update and enhance the quality of Tehran's program by researching updated curricula from leading nursing schools worldwide, particularly from institutions like the University of Maryland.
- Based on the study results, it is proposed to reduce the total number of thesis credits to 4.

Ethical considerations

In the process of retrieving information, taking notes, and presenting the results, we prioritized neutrality and unbiased reporting. We are committed to maintaining confidentiality, respecting the privacy of the institutions involved, and adhering to ethical guidelines and standards in academic research.

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Conflict of interest

The authors declare that this research received no financial support, and there is no conflict of interest related to this article. The study was conducted with complete independence and objectivity.

Author contributions

All authors of this article made substantial and almost equal contributions to the ideation, study design, data collection, article preparation, revision, and final approval. The collaborative efforts of each author played a crucial role in the overall completion of the study.

Data availability statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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