Review Article

Identifying Structure, Process and Outcome Factors of the Clinical Specialist Nurse: A Scoping Review Study

Abstract

Background: In order to achieve the major goals of transformation in the health care system, organizing and developing the existing potential properly play a pivotal role. The objective is to conduct a scoping review to describe available extent of literatures about scattered structure, process, and outcome factors of the clinical specialist nurse and redesign those as three cohesive and interconnected factors. **Materials and Methods:** A scoping review of studies was conducted from 1970 to June 20, 2020, focusing on the structure, process, and outcome factors of the clinical specialist nurse from six databases. **Results:** Forty-six studies were carried out. Structure (individual characteristics, intra-organizational, and governance factors), process (professional interactions, and roles and duties of a specialist nurse), and outcome (patient and family, nurse, and organizational outcomes) factors were identified. **Conclusions:** With the correct knowledge of the factors, it is possible to achieve the desired therapeutic, organizational, and professional results of nursing by providing the necessary fields in the structure, process, and outcomes. The identification of structures, processes, and outcomes that influence clinical nurse's role implementation may inform strategies used by providers and decision makers to optimize these roles across healthcare settings and guarantee the delivery of high-quality care.

Keywords: *Clinical nurse specialist, outcome, process, structure*

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Introduction

Through time, the health care system has undergone significant changes due to demographic and cultural diversities, technological advances, changes in disease patterns, and community expectations of how health care services provided.[1] Due to this, many decision-makers in the health care system have forced countries to develop specialized nursing roles to meet the needs of society[2] and improving the quality of care.[3]

A clinical specialist nurse, known as a registered nurse with a master's or doctoral degree who uses knowledge, skills, evidence, and scientific research as a trainer, researcher, consultant, and leader, provides safe, high-quality, and cost-effective care for the patients.[4,5]

The results of a systematic review study of Donald *et al*.[6] entitled "the Impact of nurses' specialist on long-term care" showed that the use of specialist nurses has associated with increasing quality of health care, job, and family satisfaction. Descriptive study of Lamb entitled "ability of the leadership role of nurses specialist" showed that the specialist nurses have a high level of leadership power and with this ability, they provide better conditions in terms of care and quality services for the patients.[5] However, after more than 60 years of activity of the clinical specialist nurse as one of the four types of specialist nurses[7,8] and as a part of the health care system, the performance of specialist nurses in organizations is still different in spite of their determined role.[4] Despite the efforts made by the community of specialist nurses to increase the understanding of others and differentiate this role from other nurses,[7] in some cases, this role in the health care system is used incorrectly and contradictory.[7]

Studies show that using the role of the clinical specialist nurse correctly in the health care system has led to a reduction in patient mortality and improving the quality of care.[3,9] Therefore, by employing a

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clinical specialist nurse, followed by improving the quality of care, mortality can be greatly reduced, but assessing the care is necessary to improve the quality of care.[10] Assessing the quality of care shows how health programs are implemented and identifies program deficiencies so that problems can be addressed.[11]

There are several models for evaluating the quality of care;[12] the most widely used model in measuring and evaluating the quality of care is evaluation of services in terms of structure, process, and outcome[10] and was introduced in 1980 by Donabedian.[13] According to this model, the assessment path of care quality starts from the structure, then moves towards the process, and finally ends in the outcome. Structure means describing the physical, organizational, and other characteristics of the care delivery system, process means the method and how to provide care, and outcome means the impact of services on the health status of patients and people.[13]

Some studies examined only the structural and process factors,[14] some the outcome of the role of the clinical specialist nurse,[15] and one study has briefly been referred to structural, process, and outcome factors.[4] Therefore, our objective was to conduct a scoping review to describe available extent literatures about scattered structure, process, and outcomes factors of clinical specialist nurse and redesign those as three cohesive and interconnected factors.

Materials and Methods

Scoping studies are used to review related articles to identify extent of a concept.[10] The scoping review study was conducted from 1970 to June 20, 2020, which deals with a wide range of articles related to the intended goals and on the role of the clinical specialist nurse based on the provided framework by the Joannah Briggs institute,[16] created by Arksey and Omalley.[17]

Research strategy was set up based on the Joannah Briggs institute framework.[16] The research strategy consists of three steps: In the first step, a limited study was performed at the Scopus database to find keywords by analyzing the words in the title and abstract of the retrieved articles. In the second step, the study was performed based on the specified keywords, and in the third step, the list of sources of the retrieved articles was also investigated.

The following databases have been used to search for published articles: Persian databases such as MagIran, Iran Medex, and SID, and English articles such as Scopus, PubMed, and Web of science. All related Persian and English accessible articles that have a good score in quality appraisal (≥60% for each appraisal tool of total score) were considered as inclusion criteria. Duplicate titles and non-related titles to clinical specialist nurse were also excluded from the study [Figure 1].

To choose from articles, first, the survey of articles was done by three researchers separately, and then the obtained titles were examined and consensus was reached. After removing duplicates and irrelevant articles, the titles and then the abstracts of the articles were reviewed by two researchers based on the relevance to the research question and then the articles with inclusion criteria screened for the next step [Figure 1]. Finally, the full text of the remaining articles was reviewed according to inclusion criteria.

The quality of final selected articles was evaluated separately by three researchers. CASP tool was used to evaluate qualitative articles, STROB tool was used for quantitative articles, and PRISMA tool was used to evaluate meta-analysis and systematic articles.[18,19] For qualitative articles, a score of 6 or higher of CASP (total score 10) was considered as good. STROBE tool (total score 22) was selected for quantitative articles, and a score of 15 or higher was regarded as good. For a systematic review, a score 18 or higher of PRISMA (total score 27) was assumed good [Table 1]. In cases of disagreement, discussion was continued until a final agreement between the three researchers was reached.

After reviewing 6 databases, a total of 22,719 abstracts were gathered. Duplicate articles were removed and 15,435 articles were remained. After screening the titles and abstract, only 115 articles were related to the research question in which the full text of them was reviewed. After reviewing the full-text of articles according to the inclusion and exclusion criteria, finally 46 articles were selected for the final review [Figure 1].

An adapted form of the Joannah Briggs Institute was used for data extraction, which was related to scoping studies.[16] After reviewing and comparing the findings of each article, the initial themes were formed, then all the themes were reviewed and discussed among the members of research teams; any changes also were applied as needed.[62]

Ethical considerations

Researchers tried to act in an unbiased way to analyze the retrieved data of articles. Ethics committee of Bagiyatallah University of Medical Sciences approved this study (Project code: IR.BMSU.REC.REC.1399.288).

Results

Summary of themes

Based on the extracted codes, three factors including structure (individual characteristics, intra-organizational, and governance factors), process (professional interactions, roles, and responsibilities of the specialist nurse), and outcome (patient and family, nurse, and organizational) were selected. The themes were explained as follows:

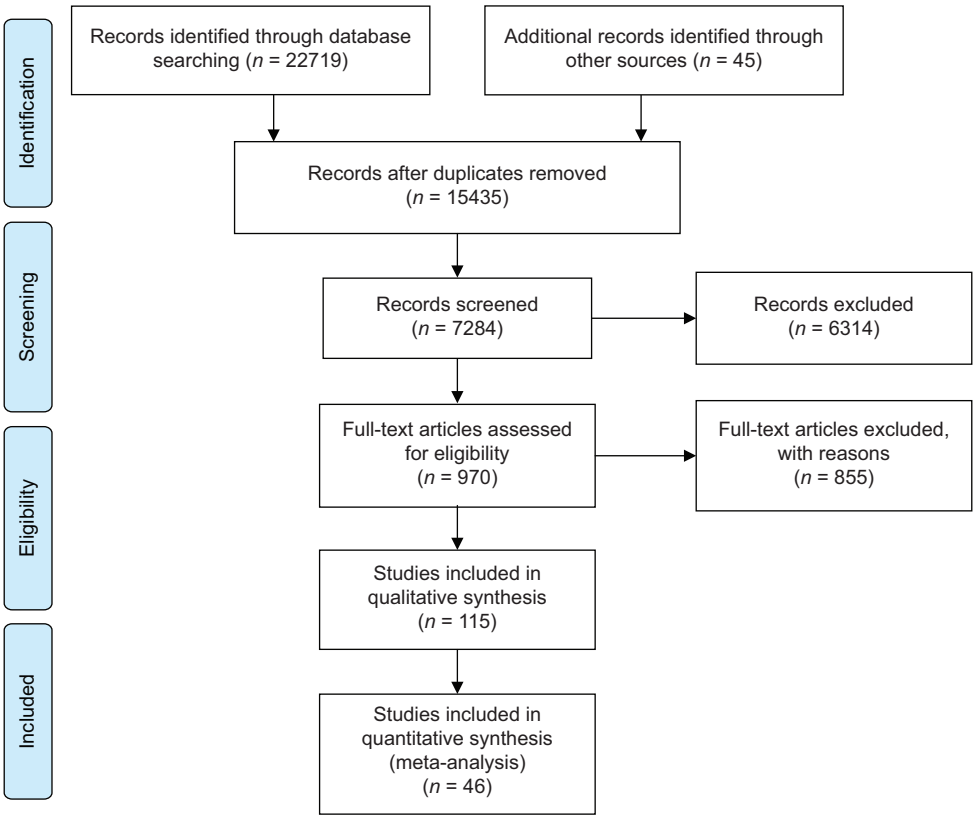

Figure 1: Flowchart of identification and selection of studies

Structural factors

These factors determine the necessary conditions to promote the role of the nurse toward clinical specialist nurse.[45] Sub-categories of individual characteristics includes: evidence-based practice (15-time), clinical judgment (2-time), Decision-making power (4-time), problem-solving ability (3-time), moral characteristics, empathy, responsibility (6-time), professional competence (Knowledge, attitude, professional and specialized skills, and technical ability) (12-time), systematic thinking (1-time), job commitment (1-time), work experience (5-time), having certificate of a clinical specialist nurse (7-time), having at least a master's degree (18-time), independent performance (2-time), critical thinking (3-time) and having a multifaceted nature of education, research, management, leadership, and clinical (4-time).

Sub-categories of intra-organizational factors include scientific promotion and specialized knowledge (4-time), explanation the scope of activities in the specialized and managerial field (complex decision-making power, moral, department management, team and health, and safety and quality assurance) (6-time), approval of specialized nursing courses by organizations for professional competence (7-time), budgeting (10-time), having experienced professors in various fields (4-time), specifying the structure and standards of education (7-time), editing specialized educational curriculum (12-time), explaining and clarifying the role of specialist nurse (15-time), determining facilitating factors and barriers (6-time), having an organizational chart (manpower) (7-time), need for expertise according to the context and culture (5-time), understanding the importance and role of clinical specialist nurse by officials (5-time), and provision of nurse welfare facilities (private room, meeting place for specialist nurse) (1-time). Sub-categories of governance factors include determining the rules and regulations (9-time), support of government institutions (11-time), and determining the educational requirements and creating a culture of the importance of the role (6-time).

Process factors

Process factors have been expressed through practice, participation, and working relationships of team members, including doctors and other nurses.[63] Sub-categories of professional interactions are communication with the patient and his family (21-time), education to the patient and their family (10-time), communication with other members of treatment team (28-time), communication with team members for independent prescription (2-time), submission integrated and coordinated care with treatment team (4-time), cooperation and gaining trust for effectiveness (2-time), partnership with team to solve the problem (3-time), and participation in meetings and conferences with team members (5-time).

Table 1: Some examples of articles' selected codes

Author Year	Country	Design	Selected codes	Quality appraisal
Zhang 2020[14]	China	Qualitative	Evidence-based practice, complex decisions, professionalism, communication and co-operation, education and development, and leadership.	CASP* 80%
Massaroli 2019[20]	Brazil	Qualitative	Education and professional development, Communication, Decision making and Ethics.	CASP 80%
Jølstad 2019[21]	Norway	Qualitative	Changes in the professional paradigm; clinical supervisor's style and clinical supervisors, professional growth.	CASP 90%
Irajpour 2020[22]	Iran	Qualitative	Role titles, prioritization of the necessary specialties; the necessary competencies of nurses at specialist level	CASP 100%
Bruce 2019[23]	Africa	Qualitative	Change expectations, Ambiguous practice environments, Feeling powerless, Having some influences, and workplace support.	CASP 100%
Valizadeh 2018[24]	Iran	Qualitative	Patient-centered care, knowledge-based care, and skillful practice.	CASP 90%
Mayhew 2018[25]	Canada	Qualitative	Implementation strategies, nurse likelihood to recommend, impact on nursing practice, and perceived influence on patients.	CASP 100%
Latham 2018[26]	England	Qualitative	Perceived benefits of nurse independent prescribing; Barriers to prescribing practice; Impact of prescribing on role; Reflections on the nurse independent prescribing course; and Recommending the role to others.	CASP 60%
King 2018[27]	New Zealand	Qualitative	Holistic expertise and communication	CASP 100%
Fallon 2018[15]	Irish	Qualitative	Multidimensional Role; interacting and collaborating; and advancing the role	CASP 80%
Casey 2017[28]	Ireland	Qualitative	Experience and organizational support; impact of specialist and advanced practice roles on patient outcomes; barriers and facilitators to enacting specialist and advanced practice roles; and future development of these roles.	CASP 100%
Martins 2016[29]	UK	Qualitative	Case load size; staffing numbers; resources available in the hospital and community	CASP 100%
Saunders 2015[8]	USA	Qualitative	Work patterns included office activities, patient rounds, working with nurses, attending meetings, and supporting quality improvement initiatives.	CASP 80%
Jokiniemi 2015[30]	Finland	Qualitative	Comprehensive skills and knowledge, role achievement.	CASP 100%
Hellqvist 2015[31]	Sweden	Qualitative	Competent, professional practice, tailored for the individual.	CASP 90%
Whittaker 2014[32]	Ireland	Qualitative	Influence of organizational culture; influence of the individual; and learning and development solutions	CASP 80%
Bostro¨m 2014[33]	Sweden	Qualitative	Becoming empowered, approaching each other from different perspectives, Struggling for authority.	CASP 80%
Onishi 2010[34]	Canada	Qualitative	Facilitating general nurses learning; monitoring and improving the patient care standard; developing new roles for nursing.	CASP 70%
Gibson 2001[35]	China	Qualitative	Role components; experience versus education; supportive strategies; personal qualities; future role development and development strategies.	CASP 100%
Carroll 1998[36]	UK	Qualitative	Staging the process; Structuring the role of facilitator; Being in a neutral role; Education or experience.	CASP 70%
Doody 2017[37]	Ireland	Qualitative	Client care; Family care; Staff support; Service support; Community support; Other agencies support	CASP 80%
Husband 2006[38]	USA	Qualitative	Conflict of expectations; credibility as a teacher; and making the education role work.	CASP 70%
Kobleder 2017[39]	Switzerland	Qualitative	Counseling; guidance; key contact person; team support, provision of resources; and extended knowledge	CASP 100%
Cook 2020[40]	Australia	Qualitative	Delineation of roles; Identifiable career path; and what should I be doing	CASP 90%
Willard 2007[41]	UK	Qualitative	Acceptance especially by doctors.	CASP 80%
Lopatina 2017[42]	Canada	Qualitative	Standard guidelines for economic evaluation	CASP 60%
Wallace 2019[43]	USA	Qualitative	Contribute in multidisciplinary team meetings: sharing information, asking questions, providing practical suggestions,	CASP 90%

Contd...

Table 1: Contd...

Author Year	Country	Design	Selected codes	Quality appraisal
Sundler 2019[44]	Sweden	Quantitative	Time for discussion on their performance assessment; acknowledged the students previous work experiences.	STROB** 86%
Kilpatrick 2016[45]	Canada	Quantitative	The identification of specific structures and processes, to pinpoint key areas to address when implementing a needs-based Clinical Nurse Specialist (CNS) role.	STROB 81%
Fulton 2016[46]	Indiana	Quantitative	concordance between identified outcomes and actual CNS practice	STROB 95%
Colwill 2014[47]	USA	Quantitative	efficient care, cost savings or earnings for organizations, improved quality or other outcome metrics provides proof of value of CNS work, revenue generation billable activities and practicing	STROB 81%
Wickham 2013[48]	Ireland	Quantitative	roles of researcher, educator, communicator, change agent, leader and clinical specialist	STROB 73%
Kilpatrick 2013[49]	Canada	Quantitative	Variation practice patterns of clinical nurse specialists across clinical specialties, Graduate- level education influenced their practice patterns. Supportive administrative structures and resources for specialist role development	STROB 95%
Kim 2011[50]	Korea	Quantitative	increase health-related quality of life satisfaction	STROB 73%
Chang 2001[51]	China	Quantitative	the perceptions of importance of the administration, clinical practice, education and research roles,	STROB 86%
Comiskey 2014[52]	Ireland	Quantitative	Having good effects on the anxieties, dignity and respect, time waited, confidence in the clinician	STROB 91%
Doody 2017[53]	Ireland	Quantitative	Roles as clinical specialist, educator, communicator, researcher, change agent, and leader, supporting person-centered care and improving service delivery.	STROB 86%
Kilpatrick 2016[54]	Canada	Quantitative	Clinical, research, scholarly and professional development, and consultation activities, improved role satisfaction, intent to stay	STROB 95%
Lawler 2020[55]	UK	Quantitative	barriers to service provision: access to education and training, workload, time for service development, lack of administrative assistance and lack of psychological services	STROB 95%
Kitajima 2020[56]	Japan	Quantitative	Cross-departmental activities, positive evaluation from senior stuff, appropriate staff allocation .	STROB 86%
Fukuda 2020[57]	Japan	Quantitative	presence of a CNS as ICU head nurse was associated with lower ICU mortality and fewer patients receiving mechanical ventilation in the ICU	STROB 86%
Ryskina 2019[58]	USA	Quantitative	Lower use of long-stay antipsychotic medications and indwelling bladder catheters, low prevalence of depressive symptoms, urinary tract infections, use of restraints, or short-stay antipsychotic use.	STROB 95%
Whitehead 2019[9]	Australia	Systematic review	Patient mortality, patient satisfaction. personal and professional factors, knowledge and skills, organizational commitment, job satisfaction, empowerment and confidence. organizational benefits, nursing turnover and vacancy rates, perception of healthcare, and costs to the organization.	PRISMA*** 100%
Cook 2015[59]	Australia	Systematic review	Positive effects of interventions by specialist nurses, the assessment of evidence quality.	PRISMA 94%
Forbes 2003[60]	UK	Systematic review	support current descriptions of the role – meaning, good fit between the role and the care needs	PRISMA 94%
Rawther 2020[61]	India	Systematic review	Physical problems, psychological problems, patient satisfaction, patient needs, quality of life and cost data.	PRISMA 94%

*critical appraisal skills Programs; **Strengthening the Reporting of Observational Studies in Epidemiology; ***Preferred Reporting Items for Systematic Reviews and Meta-Analyses

Sub-categories of "duties of a clinical specialist nurses" are management and leadership roles (19-time), supervision to provide a calm and respectful environment and treatment (7-time), support and recognition of new nurses (4-time), implementation and use of scientific evidence in the clinic (6-time), the role of care depending on the patient's needs (3-time), the role of diagnosis, treatment and prevention (6-time), community needs assessment (1-time), the role of education, research and clinical (18-time), Policy making (1-time), the responsibility of clinical specialist nurse for action taken (4-time), training of general nurses and medical

staff (12-time), and gaining new and up-to-date experiences in care (6-time).

Outcome factors

These factors explain the effects of employing a clinical specialist nurse according to the results of treatment measures.[52] The sub-categories of "Patient and family outcomes" are as follows: increasing patient satisfaction (9-time), prevention of patient readmission to hospital (4-time), reducing mortality (5-time), complication prevention and control (5-time), reduction of staying time in hospital (5-time), improving the quality of services and clinical care of nurse (15-time), encouragement and involving patient to self-care (increase treatment adherence)(5-time), meeting the patient's physical and environmental needs (2-time), reducing the patient's medical expenses (19-time), availability of care and clinical specialist nurse (6-time), training and emotional support of patients and their families (9-time), and decreasing anxiety (3-time).

The sub-categories of "nurse outcomes" include increasing job satisfaction (5-time), professional, specialized qualification promotion (4-time), and the formation (employment) of clinical specialist nurse (2-time).

The sub-categories of "organizational outcomes" are as follows: increasing the credibility of organization and attracting nurses (1-time), preventing leaving the job (2-time), reducing organizational costs (7-time), promoting organization (5-time), and improving organizational performances (2-time).

Discussion

Due to the complexity of the process of playing the role of a clinical specialist nurse, identifying and recognizing the factors are of particular importance;[64] therefore, this study was conducted to describe available extent of literatures about scattered structure, process, and outcome factors of clinical specialist nurse and redesign those as three cohesive and interconnected factors; then, the authors applied results of this study to provide more evidence supporting the structure, process, and outcome factors to clarify the role of clinical specialist nurse. One of the strengths of the current study is the process of searching for articles without considering the time period, reviewing abstracts and titles of articles, and evaluating the quality of articles by three researchers separately. All authors also endorsed the extracted themes and the number of times that were repeated in the articles. Weaknesses of the study include the omission of non-English and non-Persian articles and the impossibility of properly evaluating narrative review articles due to the lack of qualitative evaluation tools. Moreover, the authors did not search in some databases like EMBASE, Cochrane, and CINAHL due to lack of access to those sites.

One of the subcategories was individual characteristics as having a degree/license of specialist nurse, recognizing the role of specialist nurse, systemic thinking, evidence-based performance, management, and leadership[14,45] that is consistent with our study findings; moreover; the results of the included studies showed that due to the complex situation and extensive changes in health care services, clinical specialist nurse should be able to update their knowledge, professional skills, and technical abilities by continuing to study at the postgraduate level, which are important and the main pillars of the personal characteristics of a clinical specialist nurse because a clinical specialist nurse plays a pivotal role in the delivery of evidence-based practice, and specific competency guidance has been established to facilitate critical care nursing practice and education development in many developed countries.[65,66]

Another subcategory is an organizational factor which defines the scope of activity of clinical specialist nurse and clarifies the role of the nurse.[4] Based on the current study, even though they have the necessary characteristics to play the role of a clinical specialist nurse, these persons should be supported by the organization and the organization should create educational and organizational structures with a correct understanding of the role of clinical specialist nurse, training specialized nurses, removing existing barriers by using relevant educational curriculum, and experienced professors fitted to the context and culture of the country. Some authors believed that redesigning the job description, documenting role-specific activities, and capturing role-sensitive outcomes have a key role in successfully establishment of the clinical specialist nurse role and could sufficiently differentiate from other nursing roles.[7]

Final subcategory is governing factor, to the best of the authors' knowledge, for the first time, this concept has been introduced as a separate subcategory in current study; although review of the literatures demonstrated, the factor in other studies has differently labeled as determining laws and regulations[14] and the support of government institutions.[22]

Professional interactions, roles, and responsibilities of clinical specialist nurse are the subcategories of process factor that is consistent with the study of Kilpatrick *et al*.[45] (2016) which expresses interactive factors such as communication and acquaintance of clinical specialist nurse with other members of treatment team, cooperation, and gaining trust for effectiveness and partnership with treatment team to solve the problem, and the role of management and leadership, but do not mention the interactions of clinical specialist nurse and treatment team with the patient and the patient's family to provide integrated and coherent care. However, recently, it is stated that a small variability was found in the comparison of using from a clinical specialist nurse in core competency in the spheres of patient, nursing, organization, and scholarship.[67]

Another noteworthy issue that has been neglected is the knowledge of a clinical specialist nurse about his/her roles and responsibilities as a manager, leader, researcher, clinical educator than general nurses, providing care according to the need and accepting responsibility before evidence-based treatment for the patient in order to establish these interactions, because Poulton believes how to care by treatment team as a process leads to the realization of more than a quarter of the effectiveness of occupational therapy;[68] one of the most guiding studies for better performing the roles and responsibilities is Contandriopoulos and their colleagues study that demonstrated five themes which includes planning, role definition, practice model, collaboration, and team support.[69]

Patient and their family, nurse, and organization outcomes were extracted, which refers to the importance of the role of clinical specialist nurse in organizational outcome that is consistent with other quantitative and qualitative studies.[50,54] However, in aforementioned studies, only the effect of the role of clinical specialist nurse on the patient is considered and its influence on preventing from leaving the job of medical staff and consequently improving performance and reducing costs of the organization has not been considered. The outcomes that bring about job satisfaction, formation, and promotion of professional and specialized qualifications for nurses are not discussed. Some authors declared that current guidelines should form the foundation for such evaluations of clinical specialist nurse roles; the proposed role-specific considerations which clarifies application of standard guidelines sections to such evaluation of clinical specialist nurse could strengthen the quality and comprehensiveness of future evaluations of these roles.[42,70] One of the main limitations of the present study was lack of access to the EMbase website and lack of access to interviews with specialist nurses abroad.

Conclusion

Considering the involving factors in structure, process, and outcome area of clinical specialist nurse role can guarantee the key to successful establishment of the clinical specialist nurse role and sufficiently differentiate it from other nursing roles, having lasting effect on the patient life, their family, the organization, and even the clinical specialist nurse. Moreover, with the correct knowledge of aforementioned factors, it is possible to achieve the desired therapeutic, organizational, and professional results of nursing by providing the necessary fields in the structure, process, and outcome that may inform strategies used by providers and decision makers to optimize these roles across healthcare settings and support the delivery of high-quality care.

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Conflicts of interest

Nothing to declare.

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