



Development of a Geriatric Nursing-Specific Mini-CEX and Evaluation of the Professional Competence of Nursing Students: A Novel Approach to Clinical Evaluation in Implementing Case Study

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Abstract

Background: Geriatric nursing is professional holistic care that requires special attention and the development of professional competence. No valid and reliable tool exists to evaluate professional geriatric competencies (PGC) of nursing students in professional practice which remains a debatable issue in nursing education. Therefore, the present study was conducted to fill data scarcity.

Objectives: The present study aimed to develop a Geriatric Nursing-Specific Mini-CEX (GN-Specific Mini-CEX) tool to evaluate the professional geriatric competencies of internship nursing students.

Methods: The present study is descriptive observational quantitative with a cross-sectional design. The Geriatric Nursing-Specific Mini-CEX tool was developed in seven skill domains and 40 items based on the core competencies of geriatric nursing, published literature, and expert opinions. Delphi method was applied to evaluate the face and content validity, and reliability was determined using Cronbach's alpha test through a pilot test. The modified tool was scored between 1 to 9 in each item of skill domains with a total score of 40 to 360. Higher scores indicate a higher professional geriatric competence for nursing students. Then, 160 internship undergraduate nursing students were selected by convenience sampling from Mashhad University of Medical Sciences (MUMS) as one of the major medical sciences universities of Iran, in January 2020. One-day workshop of evaluators was held in two sessions and the professional geriatric competencies of students were evaluated by implementing case studies. The results were analyzed with inter-rater reliability and descriptive statistics.

Results: ICC values for seven components of geriatric nursing-specific Mini-CEX ranged from 0.639 to 0.919, indicating an acceptable level of reliability for this scale. The mean score of overall geriatric competence was (M= 6.12, SD=.33), which indicated that the geriatric competencies of students enrolled in the study were at a satisfactory moderate level. The highest and the lowest mean scores were observed in history taking /communication (M= 6.71, SD=.71) and physical examination skills (M= 4.99, SD=.67), respectively.

Conclusion: The results of this study indicate the feasibility of using new developed geriatric nursing-specific Mini-CEX tool to evaluate the professional geriatric competencies of nursing students through implementing case studies in professional clinical settings. The data obtained from the present study could be useful for nursing education to evaluate and redesign a curriculum for integrative core geriatric competencies as a process of quality improvement.

Keywords: Case study, Geriatric competencies, Mini-CEX, Nursing students, Professional competence

1. Background

Concerning the growing population of geriatric patients, worldwide, the academic and clinical preparation of nursing students as future health professionals is critical to improving general and geriatric competencies through the development of professional competence. (1). The word "competence" is a complex and multidimensional concept, a set of attributes that underlies the desirable performance of the person (2). Nursing is one of the leading professions in the healthcare system (3). Three issues need to be considered to equip internship nursing students to develop the necessary competencies: the core competencies should be defined based on established definitions, and effective methods should

be developed to bridge the gap between academic knowledge and professional clinical practice and effective performance evaluations should be implemented (4). A core competency of nursing is the ability to practice nursing which fulfills the needs of clients cared for using logical and critical thinking and accurate nursing skills based on the model of nursing care process (5). Cultivation of core competencies has recently become a key global issue in developing nursing education (6). A gap exists between the expected competence of nursing staff employed to provide care; the call for the need to measure clinical competence among nurses remains a debatable issue in nursing education (4). Besides, the current treatments and care programs should focus on modifying the quality of life of patients (7). Therefore,

the professional competence of nursing students in all specialties and specifically in geriatrics requires the development of core competencies and awareness of the specific needs of patients and relevant caring for patients (8-10).

Geriatric nursing is professional holistic care that needs special attention (8). The main objective of geriatric nursing education is to train competent nursing professionals who possess the knowledge, skills, and attitudes appropriate to the needs of the elderly, the ability to solve problems and exhibit clinical geriatric competence (11). Aging causes various health problems, such as physical, mental, social, and intellectual weakness, diseases, syndromes, and issues that reduce the quality of life, and also increase the need for attention and assessment of functional status (8). Concerning about 60% of medical-surgical patients are geriatric patients, therefore, non-geriatric nursing students need to assess their competence and be educated in minimum geriatrics competencies (12). Therefore, competent nursing students must be optimally equipped with core geriatric competencies through training and implementing Comprehensive Geriatric Assessment (CGA) to fulfill the unique needs of older adults (1).

Accordingly, professional competence in geriatric care refers to a set of attitudes, knowledge, behaviors, and skills that nurses use in the process of the clinical nursing of geriatric patients. Evaluating PGC in internship nursing students during professional practice is essential since it provides a vital understanding for the development of strategies to enhance competence, particularly among non-geriatric nursing students (12). Considering that the number of elderly people in Iran has reached 10 million in 2021, which constitutes about 10% of the total population, meanwhile (13), the definition of knowledge and geriatric competence contents are limited in the undergraduate curriculum of nursing education in Iran, particularly in the internship training program. Recently, Bahrami et al. (2019) conducted a study on the components of geriatric nursing competencies in caring for older people in hospitals which included three fundamental geriatric core competencies of patient and family-centered care, process-oriented care, and self-care and continuing professional development (11). However, to the best of our knowledge, limited information exists on the components of geriatric competencies of nursing students in internship practice and evaluation of professional geriatric competence through specific measurement tools among nursing students in Iran.

Assessment of professional practice in undergraduate nursing programs entails designing tools that can be reliably assessed against a broad set of national competence standards. The substantial instrument for measuring competence or professional competence is using self-report or self-assessment tools to measure the level of competence among

nursing students, as it can stimulate deep-level learning in the students (14). Many clinical assessment methods are available in a nursing internship program such as objective structured clinical examination (OSCE) and direct observation of procedural skills (DOPS) (15). The validity of these clinical evaluation methods is still under consideration, attitude is difficult to be evaluated, more time is needed which causes the patients to be inconvenient, totality fails to be reflected, the assessment is only performed once by an assessor, no observation and feedback are directly provided so that clinical preceptor fails to recognize the strengths and weaknesses of students (16). New methods of assessment focus on the dimensions of clinical work and competence skills such as communicative skills, clinical skills assessment, nursing diagnostic and professional actions. Additionally, professional clinical competence is not knowledge or practical ability; therefore, it incorporates other components such as professionalism, impersonal skills, self-assessment, decision making, and clinical judgment to progress nursing intervention. Accordingly, conventional knowledge-based assessment methods failed to assess these areas (17).

Furthermore, the nursing professional competence structure consists of four capacities include understanding the needs, providing care, collaborating, and bolstering decision-making (5). Therefore, professional clinical competence assessment should be performed through the indirect observation method in practical and real situations. A wide range of competencies of nursing staff is required to fulfill the needs of older patients in hospital care. Geriatric competence assessments can help examine geriatric competence concerning competence development (18). Therefore, using evidence-based methods, such as case studies in the evaluation of professional geriatric competence is suitable in the real world for adequate comprehensive assessment and complex care for the aging population. A nursing case study is an in-depth study of a patient encountered during the student's daily practice in a practicum (19). The literature indicates that work-based formative assessments can have a substantial impact on the behavior of learners. In this regard, Mini-CEX is one of the best measurements for evaluating workplace assessment among students. The American Board of Internal Medicine (ABIM) developed a quality assessment tool, for the first time in 1972 (20), the Mini-Clinical Evaluation Exercise (Mini-CEX), which is internationally used to assess the clinical competencies of trainees in various subspecialties in a wide variety of clinical settings. It is a cost-effective way of assessing and providing constructive feedback to the students in a structured manner. By using this method the professional clinical skills of students are evaluated through direct observation and provide

constructive feedback. However, little is known about nursing education. Recently, Liu et al. in 2019 developed a valuable specific nursing-mini clinical evaluation exercise (Mini-CEX) for nursing students and defined core competencies of nurses such as the attitudes, skills, abilities, knowledge, and behaviors necessary for safe and independent practice with high standards of patient care in a clinical setting (6). The validity and reliability calculations of mini-CEX have been conducted in some studies (6,21). The reliability and validity of the Persian version of Mini-CEX were assessed for nursing students in Iran and test stability was measured (17). The need for a specific geriatric tool to evaluate these competencies is increasing among nursing students since the quality of geriatric care and competence developments are considered. Meanwhile, no evidence is available for the development of specific professional geriatric nursing measurements in nursing students (6). No study has examined the geriatric competence of internship nursing students based on existing demands, and no instrument exists for this purpose. To the best of our knowledge, this issue has not been studied in nursing education in Iran. Therefore, the present study is crucial to fill data scarcity.

2. Objectives

The present study aimed to develop a geriatric nursing-specific Mini-Clinical Evaluation Exercise (Mini-CEX) tool and evaluate the professional competence of internship nursing students.

3. Methods

3.1. Study Design

This study is descriptive observational quantitative with a cross-sectional design. The geriatric competence measurement instrument was developed and implemented in four phases:

3.2. Phase 1- Development of Geriatric Nursing-Specific Mini-CEX Tool

The new Geriatric Nursing-Specific Mini-CEX Tool was initially designed in seven skill domains and 44 items according to geriatric core competencies of baccalaureate nursing, internship nursing education curriculum, and current literature. The tool was designed based on the seven dimensions of the Mini-CEX instrument developed by the American Board of Internal Medicine (ABIM) (20) and considering the core competencies of nurses as defined by the Iranian Nursing Accreditation Council (INAC). Nonetheless, specific care needs of geriatric patients in the hospital were considered with evidence of geriatric syndromes and issues as well as current literature on geriatric nursing competencies (6). Therefore, seven geriatric core competencies were initially included in the instrument to develop the Geriatric Nursing-Specific

Mini-CEX Tool in the present study, including communication skills and history taking, physical examination skills, clinical judgment /nursing intervention, consultation/health education to geriatric patients, and family, nursing professionalism, implementation organization/efficacy, and overall nursing geriatric competence. The descriptive items were modified for each dimension based on guidelines according to geriatric core competencies of baccalaureate nursing which were adjusted to depict the standards for geriatric competent nursing students. This study focused on observable geriatric competencies through nursing assessment and nursing care plans of geriatric patients during the implementation of a case study.

3.3. Phase 2- Evaluation of validity and reliability of the Geriatric Nursing-Specific Mini-CEX Tool

The face validity and the allocation of sample behavior items were evaluated to the appropriate dimensions using the Delphi method. The present study aimed to reach a consensus regarding which geriatric competence of nursing students and related descriptive items are more relevant to meet the current needs of geriatric patients. In this light, the instrument was validated by ten experts: three academic specialists in the field of geriatric nursing, three academic specialists in the field of educational measurement and evaluation, and four academic professors of nursing education. They evaluated the feasibility and wording of the items and detailed descriptions in the expert opinion form. The Delphi stages were consistent. In the first round, experts modified the wording of items and descriptions according to the definitions used in the study. The authors referred to the comments and observations from the first-round experts to validate the items and descriptions in the second-round Delphi. Three ratings were adopted to decide on the inclusion of dimensions: dimension is important and should be retained (3 points), dimension is important but needs to be reconsidered (2 points), and dimension is not important and should be removed (1 point). The wording of items and descriptions was modified and reexamined if experts granted 2 points. The experts demonstrated a clear consensus regarding the most relevant and current geriatric core competencies for internship nursing students in professional clinical practice. Therefore, a new competence measurement instrument was specifically developed and validated as a Geriatric Nursing-Specific Mini-CEX Tool (GN-Specific Mini-CEX).

The final modified tool consisted of 40 items in seven components for geriatric skills necessary to care for elderly patients in medical-surgical wards match with seven domains of the Mini-CEX questionnaire that scored between 1 to 9 in each question of skill parts (1–3 was “unsatisfactory,” 4–6 were “moderately satisfactory,” and 7–9 were

“satisfactory”), with a total score from 40 to 360. A higher score means a higher PGC for nursing students. A test and retest design were conducted to assess the consistency among 20 students using Interclass Correlation Coefficient (ICC) to evaluate the reliability of this geriatric nursing-specific mini-CEX, through a pilot test (Table 1). The computed Cronbach’s alpha for the 40-item of seven domains instrument indicates high internal consistency. Therefore, the instrument is reliable for measuring the PGC of nursing students.

3.4. Phase 3- Implementing workshop for the evaluators

Faculty development is a prerequisite for training evaluators to implement a successful mini-CEX assessment program. The workshop was held by the researcher for the evaluators before starting the main study to reach a consensus on the standards of scoring and maintain the inter-rater reliability of raters. Therefore, a guideline was specifically designed to assist the evaluators in defining and assessing the professional competencies of students that refers to the assessment of geriatric skills competencies of each domain. Communication competence contains the items such as addressing the geriatric patient by name, introducing yourself sincerely to a geriatric patient, and reflecting on the concerns or feelings of the geriatric patient. Defining and evaluating the seven dimensions of the checklist and tool guidelines were trained and discussed with evaluators (10 raters) through a one-day workshop in two sessions. In the first session, the background, geriatric nursing core competencies, and concept, purpose, and procedure of the Geriatric Nursing-Specific Mini-CEX Tool were presented for measuring the professional geriatric competence skills in the present study. The protocol was identical to the main study, including the assessment method using the questionnaire and checklist of Geriatric Nursing-Specific Mini-CEX Tool, description items, instructions for using the checklist, and the instruction score was performed with necessary criteria in each part, and skill.

Scores were collected from both rounds of the evaluator workshop in two sessions to evaluate the consistency of the instrument. A video of performing a standard case study of a geriatric nursing-specific Mini-CEX encounter was shown to the evaluators, who were then asked to score the encounter and

briefly explain their reasoning to the other evaluators. They then discussed their definitions of “satisfactory,” “moderately satisfactory,” and “unsatisfactory” before the researcher led a group discussion to reach a consensus on the definitions of evaluation, observed behaviors, and the content of the observed geriatric scenario. Once the evaluators reached a consensus on the scoring standards, the video was shown again to the evaluators for scoring. Communication between the evaluators was only allowed during the training phase. Additional video was provided for the evaluators to practice completing the Geriatric Nursing-Specific Mini-CEX Tool. Thus, the evaluation of the first round was collected after the video played for a geriatric case study scenario. Then researcher obtained a second evaluation after a discussion in which the evaluators agreed on the standard of performance shown in the video of the case study. Evaluators were advised to complete the observation with “sandwich” feedback followed by direct instructions for improvement. Then, the workshop was followed by the implementation of the Geriatric Nursing-Specific Mini-CEX Tool for practicing two sample scenarios related to geriatric cases with falls and diabetes as a most geriatric syndrome and issues among elderly patients in clinical practice. Assessments of PGC were conducted by ten experienced independent academic nurses in professional clinical practice. The evaluators rated the checklist, before the reliability of the instrument, and inter-rater reliability was calculated among 10 evaluators who scored 10 students independently. The corrected item-total correlation is the correlation between each item and the total score of the questionnaire. On a reliable scale, all evaluators should have an acceptable correlation with the total. The reliability coefficients for different sections of the questionnaire are presented in Table 2.

3.5. Phase 4- Evaluation of PGC in implementation of Case Study

Cross-sectional observations were launched to measure the level of the PGC of internship nursing students from the perspective of evaluators. The Geriatric Nursing-Specific Mini-CEX Tool was implemented by performing case study activities that are consistent with the steps of a nursing process model. The nursing process is considered a highly significant element in improving scientific nursing

Table 1. Interclass correlation between test-retest scores over time

Component	ICC	95% CI		P-value
		Lower Bound	Upper Bound	
History taking/Communication	.753	0.376	0.902	0.002
Physical Examination	.701	0.245	0.882	0.006
Clinical judgment/Nursing intervention	.766	0.41	0.907	0.001
Nursing Professionalism	.741	0.346	0.897	0.003
Consulting/Health Education	.860	0.647	0.945	<0.001
Organization/Efficacy	.919	0.795	0.968	<0.001
Overall Geriatric Competence	.639	0.088	0.857	0.016

Table 2. Value of Cronbach's Alpha among raters

Rater	Corrected Item-Total Correlation	Cronbach's Alpha (Pilot study)
1	.966	.889
2	.672	.913
3	.828	.907
4	.742	.906
5	.406	.924
6	.704	.909
7	.948	.891
8	.241	.933
9	.936	.891
10	.720	.906

practice. Also, it is recognized as a practical standard for assessing nurses' professional competencies by enhancing critical thinking skills and clinical judgment. Accordingly, the nursing case study consists of several sections that can be organized into three categories: the patient status, the nursing assessment of the patient, the current care plan, and possible recommendations (19). In the present study, the patient status and nursing assessment of geriatric patients were performed with a comprehensive geriatric care assessment (CGA) for identifying geriatric syndromes such as falls and diabetes in geriatric patients. CGA is a multi-disciplinary exercise that tests mental, physical, emotional, and psychological health, as well as assesses functionality, living conditions, socio-economic environment, social circles, family involvement, and anything else that determines the quality of life (18). The central philosophy in CGA should be holistic care using a person-centered approach that unites the various aspects of specialist care. The next steps of the case study were the current care plan, and possible recommendations were consistent with other steps of the nursing process such as analyzing data and formulating nursing diagnoses, planning nursing care, and implementing proper intervention and evaluation. The Geriatric Nursing-Specific Mini-CEX Tool provided a 15-minute snapshot of the way students interact with patients in a placement. The Behavioral competencies of nursing students were rated by evaluators based on observed bedside practices for the selected case of geriatric patients in medical-surgical wards and finally provided them with constructive feedback.

3.6. Data Collection

A cross-sectional observational study was conducted in January 2020. The study population was entire senior nursing students of the school of nursing from Mashhad University of Medical Sciences (MUMS) one of the major medical sciences universities in Iran, in 2020. A total of 160 nursing students were selected by a convenience sampling method from senior nursing students in the seventh semester. The calculation of sample size ($n=160$) was based on the effect size of a similar study the calculated which was $d=0.694$ by (22). The minimum sample size was

calculated from the formula of effect size and the results were 124. The adjusted total sample size was 160 considering an attrition rate of 20%.

The recruitment process of participants began after the permission and the ethical approval were granted. All students volunteered to participate in the study. The inclusion criteria included being in the seventh semester of nursing and willingness to participate in the study. The exclusion criteria were a history of being active in other internship courses or educational background in other paramedical disciplines except nursing before entering this study. Therefore, all 160 eligible participants agreed to involve in the study. A written consent form was given to ensure the protection of human rights, their participation was voluntary, and the participant could withdraw whenever they wished, no coercion was imposed and no impact on their grade, and finally data was kept anonymous and confidential. Data collection instruments include a demographic information questionnaire with five items including age, gender, marital status, the experience of clinical student work, interest in nursing, and academic achievement in form of Grade Point Average (GPA) and Geriatric Nursing-Specific Mini-CEX Tool. In the briefing session, the students were fully acquainted with the study process and the way to measure geriatric professional competence by this developed instrument and through implementing a case study and similar the evaluators a video of performing a standard geriatric case study scenario of a geriatric nursing-specific Mini-CEX encounter was shown to the students. Clinical evaluators conducted the PGC evaluation by Geriatric Nursing-Specific Mini-CEX among nursing internship students by observing students for about 15 minutes while interacting with geriatric patients in medical-surgical wards. After that, the clinical evaluator gave constructive feedback to the students on their achievement for about 5 minutes. The results of this examination were entered in the assessment sheet containing seven assessment geriatric skills domains competencies. In this study, feedback was not a result to be measured.

3.7. Data Analysis

Data were examined using SPSS software (version 23.0; SPSS, Chicago, IL). Descriptive and inferential

statistics were operated to respond to the research questions that guided this study. Descriptive statistics, such as mean (M), standard deviation (SD), and range were used to calculate the level of PGC of patients. A p-value less than 0.05 is statistically significant.

4. Results

4.1. Reliability of Geriatric Nursing-Specific Mini-CEX Tool

Table 1 presents the ICC values for seven components of geriatric nursing-specific Mini-CEX which range from 0.639 to 0.919, indicating the acceptable level of reliability for this scale (Table 1).

4.2. Inter-rater reliability of Geriatric Nursing-Specific Mini-CEX Tool

According to Table 2, the evaluators were reliable based on the reliability alpha values of all evaluators which were found to be higher than the standard of 0.70 (Cronbach's Alpha; 0.916). The mean correlation among the ten evaluators ($r = .966$) indicated a very high level of inter-rater reliability (Table 2).

4.3. Characteristics of participants

Out of 160 undergraduate internships, nursing students participated in the study. Overall, two-thirds of the participants were female undergraduate nursing students (66%) and married (71%). The age of participants varies from 22 to 24 years (22.58 ± 98). Full demographic data are presented in Table 3.

4.4. Professional Geriatric Competence (PGC)

In this study, the total score of geriatric nursing-specific Mini-CEX and its dimensions were categorized into unsatisfactory, moderately satisfactory, and

satisfactory levels based on the scoring of the geriatric nursing-specific Mini-CEX questionnaire. According to Table 4, nursing students reported an overall mean score of PGC ($M= 6.12$, $SD=.33$) out of 9 was determined to be moderately satisfactory. The highest mean score of the PGC dimensions was related to communication/ history taking ($M= 6.71$, $SD=.71$) followed by organization/ efficacy ($M= 6.27$, $SD=.46$), consulting/health education to the elderly and their family ($M= 6.16$, $SD=.36$). The lowest mean score was observed for threshold values of physical performance tests ($M= 4.99$, $SD=.67$) followed by nursing professionalism ($M= 5.63$, $SD=.48$) and clinical judgment/intervention ($M=5.76$ $SD=.43$), respectively. This indicated that all of these domains were at average points, therefore, it can be concluded that all domains of PGC skill were at a moderately satisfactory level, however, the mean score for physical examination skill met minimum expectations at an unsatisfactory level.

Table 5 shows the frequency distribution of geriatric nursing-specific Mini-CEX and its competence dimensions among nursing students. The results of the frequency distribution based on its categories indicated the majority of domains were at a moderately satisfactory level, meanwhile that of geriatric history taking/ communication skills slightly more than half of the students, 56.2% were at a satisfactory level and the rest 43.8% were at a moderately satisfactory level; however, 84.8% were at an unsatisfactory level for physical examination skills and 15.2% were at a moderately satisfactory level. For overall competence skills, none of the students was at an unsatisfactory level and the majority of them, 88.6% were at a moderately satisfactory level, but only 12.4 % of nursing students were at a satisfactory level. (Table 5, Figure 1).

Table 3. Demographic characteristics of participants (n=160)

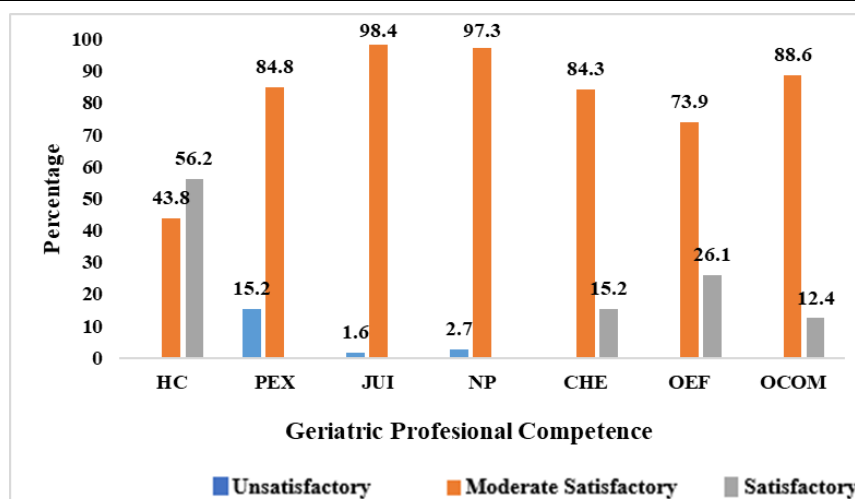
Variable	Level	n	%
Gender	Male	52	34.00
	Female	101	66.00
Marital Status	Single	109	2.78
	Married	44	71.20
Experience in Clinical Student Work	Yes	137	89.50
	No	16	10.50
Nursing Interest	High	132	86.30
	Low	21	13.00
GPA	Less than 3	8	5.00
	3 and more	145	94.80
Age	Mean \pm SD	22.58 \pm .98	

Table 4. Descriptive statistic of the Professional Geriatric Competence

Variable	Minimum	Maximum	Mean	SD
History taking/Communication	6	7	6.71	0.71
Physical Examination	4	6	4.99	0.67
Clinical judgment/Nursing Intervention	5	6	5.76	0.43
Nursing Professionalism	5	6	5.63	0.48
Consulting/Health Education	6	7	6.16	0.36
Organization/Efficacy	6	7	6.27	0.46
Overall Geriatric Competence	6	7	6.12	0.33

Table 5. Frequency distribution of Professional Geriatric Competence

Professional Competence	Unsatisfactory(N/%)	Moderate Satisfactory (N/%)	Satisfactory (N/%)
History Taking	0(0)	67(43.8)	86(56.2)
Physical Exam	24(15.2)	129(84.8)	0(0)
Judgment/Nursing Intervention	13(1.6)	150(98.4)	0(0)
Nursing Professionalism	4(2.7)	148(97.3)	0(0)
Consulting/Health Education	0(0)	129(84.3)	24(15.2)
Organization/Efficacy	0(0)	113(73.9)	40(26.1)
Overall Competency	0(0)	134(88.6)	19(12.4)

**Figure 1.** The level of Geriatric Professional Competencies domains

5. Discussion

The present study, to the best of our knowledge, is the first study in nursing education that develops a specific geriatric nursing competence measurement instrument with a Mini-CEX tool and evaluates the dimensions of professional geriatric competence (PGC) among internship nursing students. The mini-CEX is argued to be the most effective evaluation approach since it is greatly accurate in assessing the clinical skills competence of students. The findings of this study showed that identifying geriatric care skills is a required professional competence for nursing students in caring for elderly patients before entering professional internship practice. Furthermore, it is a cost-effective way of assessing and giving constructive feedback to the students in a structured manner. The instrument was checked for inter-rater reliability to confirm the consistency of evaluation scores, and the two-round Delphi method was used to confirm the face and content validity. These findings are consistent with the results of previous studies in different nursing-specific Mini-CEX tools (4,6,23).

The present study indicated that the Iranian undergraduate nursing students obtained the mean score of overall PGC at a moderately satisfactory level. This finding is consistent with those of other studies which revealed that the overall clinical competence of nursing students was at a moderately satisfactory level (24), (4,6,23). The reason for these results may be that students have been exposed to

general and geriatric competence clinical skills domains during their educational program at academic stages for six semesters. Therefore, the students have recognized, internalized, and acquired professional competence during their academic stages, however, they are unfamiliar with specific professional core geriatric competencies, geriatric syndrome, and issues in caring for geriatric patients and they failed to train professionally in geriatric nursing at a satisfactory or superior level.

Nursing students had the highest mean score of the PGC domains belonged to history taking/communication, followed by organization/efficacy, and consulting/health education were at a moderately satisfactory level. The highest mean score of PGC skills was for history taking/communication domain at a moderately satisfactory level, however, the lowest mean score was observed for physical examination at the unsatisfactory level followed by nursing professionalism and clinical judgment/intervention, respectively. These findings are consistent with previous studies (4,6,23)

Communication skills are important factors in acquiring geriatric clinical competence, especially understanding the emotions of the elderly is a subset of social skills (24). Clear communication is critical to all aspects of nursing care. Communication between patients and healthcare providers plays a vital role in providing a better quality of life for patients (25). Patients may not comprehend their diagnosis, treatment options, and physicians will be hard-

pressed to understand their patients' needs without clear communication. In the present study, the nursing students were accustomed to taking histories of geriatric patients during their academic studies, as it was one of the outcomes of their learning and the common duty of nursing students during the previous semesters in clinical practice. Therefore, the students were familiar with this competence area and reported it as the highest score in this study when entering the professional clinical practice. Meanwhile, concerning very limited geriatric content in the undergraduate curriculum of Iran and other countries the students fail to learn enough knowledge regarding important concepts of geriatrics such as geriatric syndromes, issues, and skills of Comprehensive Geriatric Assessment (CGA) to develop professional geriatric competence to a satisfactory or superior level. Therefore, special educational training on comprehensive geriatric assessment and identification of geriatric syndromes and issues in delivering competent care for elderly patients in hospitals is necessary among internship nursing students.

In contrast, the students failed to perform well on physical examination skills for geriatric patients as this skill was not well-practiced during the academic stage of their professional nursing program. Therefore, they reported the lowest score of PGC in performing physical examination competence for their geriatric patients and also followed by nursing professionalism and clinical judgment/intervention, respectively. A study which was conducted in Taiwan among nursing students reported scored the highest on nursing professionalism and the lowest on physical examination (6). A study conducted in India indicated that significant improvements were reported in the professional geriatric competencies domains of history taking, physical examination, counseling skills, and professionalism, and also a superior level of overall competence (26). The results of all the above mentioned studies partially support the results of the present study. In brief, the study demonstrated that geriatric nursing-specific is an innovative approach for assessing and providing feedback on professional geriatric competence, and no identified evidence of its use in geriatric nursing education is available despite its use globally in medical education.

5.1. Strengths and Limitations

This study has some strengths and limitations. The first limitation of this study is that it only studied internship nursing students; therefore, the results of this study can be generalized to senior students. Generalization to other students requires broader research, including other nursing student groups from different parts of the country. Another important limitation is that the changes in clinical practice behaviors were not measured following

evaluation and feedback. The most essential strength is that, to the best of our knowledge, this is the first study that has developed a tool and evaluation of the geriatric professional competence of internship nursing students with the Mini-CEX instrument in implementing a case study. One interesting finding in the present study is that students used geriatric nursing-specific Mini-CEX as a teaching-learning tool instead of a pure assessment tool. Therefore, the usefulness of geriatric nursing-specific Mini-CEX should be further investigated, especially for undergraduate nursing students. The study has provided useful data for future research which can compare the results of the Iranian nursing student to those of other nursing groups. Furthermore, it offers opportunities for using this valuable evaluation approach and implementing the novel case-based study in education within the constraint of the COVID19 which led to uncovering psycho behavioral effects, particularly among the younger generation in Iran (27).

6. Conclusion

This study indicates the feasibility of using the newly developed Geriatric Nursing-Specific Mini-CEX tool (GN-Specific Mini-CEX) to evaluate the core geriatric competencies of Iranian nursing students. The study supports the application of the Mini-CEX tool to assess professional geriatric competence through implementing case studies for the care of elderly patients in professional clinical settings. Therefore, an interventional study using various professional development learning strategies is needed to see the way internship nursing students address geriatric professional competence issues during professional clinical practice. Moreover, the finding of this study could be used as a basis for international studies assuming that older people in need of health care have the same requirements across cultures.

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Footnotes

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