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Original Article

Evaluation of clinical competence and its related factors among ICU nurses in Kermanshah-Iran: A cross-sectional study

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ABSTRACT

Objectives: The present study was conducted to evaluate the clinical competence and its related demographic factors among critical care nurses in Kermanshah, Iran.
Methods: In this cross-sectional study, 155 Iranian nurses were selected by stratified random sampling. The data collection tools included a personal information form and the "Nurse Competence Scale". Data were analyzed using descriptive and analytical statistics.
Results: The mean score of nurses' clinical competence was equal to 76.14 ± 1.59 out of 100, which was at a "very good level". The mean score of using clinical competence in practice was equal to 70.38 ± 15.25 out of 100, which was at a "good level". Among the subscales of clinical competence, the highest mean score was related to "managing situation". The mean score of "using clinical competence in practice" was related to the subscale of "therapeutic interventions". There was no statistically significant difference among the score of clinical competence of nurses varying with different gender, age, academic degree, and work experience.
Conclusions: The clinical competence of critical care nurses in Kermanshah was at a "very good" level, and the use of clinical competence in practice was at a "good level." Given the importance of clinical competencies in practice, nurses' clinical competence should be evaluated objectively and positive measures should be taken to promote the application of their clinical competence.

What is known?

- Competence is one of the requirements that nurses should have in clinical settings.
- Competence is a fundamental component of nursing care and plays an important role in the quality of services provided by nurses.

What is new?

- The clinical competence of nurses in Kermanshah, Iran was self-reported at a "very good" level, and the use of clinical competence in practice was at a "good level."
- No statistically significant difference was found among the scores of clinical competence and the use of clinical competence of nurses varying with different gender, age, academic degree, and work experience.

1. Introduction

Nurses are one of the key components of the health care system and play an important role in providing high-quality health services and promoting the health of society [1]. Clinical competence is one of the requirements that nurses should have in clinical settings.

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Competence is a fundamental component of nursing care and plays an important role in the quality of services provided by nurses. Competence is a collection of knowledge, skills, attitude, values, and abilities increasing the efficiency and effectiveness in professional work environments [2,3]. Clinical competence includes general competencies (such as management and communication skills, professional skills, group performance, and ability to provide primary and specialized health care services), and specific competencies (such as quality care assessment, implementation of specific processes, performance monitoring, and ability to monitor health and disease) [4]. Clinical competence consists of seven dimensions including helping role, teaching-coaching, diagnostic functions, managing situations, therapeutic interventions, ensuring quality and work role [5]. In general, clinical competence is the priority and aim of the nursing profession, because the quality of care depends on the clinical competence of nurses [6].

A critical care unit is a unit where patients with critical conditions are admitted, so nurses working in these units are required to have clinical competences [7,8]. On the other hand, critical care units must have certain standards. In Iran, the standards of critical care units cover areas of management and organization, management and empowerment of human resources, design and physical space, medical equipment, facilities and technology, observance of safety principles, and quality improvement [9]. In this regard, one can point to important functional indicators of critical care unit including percentage of bed occupancy, average patient's stay, frequency of medical team's round for all hospitalized patients, annual turnover of nursing staff, patients' mortality rate, percentage of patient re-admission in the unit, and the use of information related to the patients' mortality rate, and length of stay to assess the performance of the unit [9].

Results of various studies indicate that nurses have clinical competence in hospital settings [4,10,11]. Evidence suggests that a higher level of clinical competence has a significant and positive relationship with variables such as sympathizing with colleagues and patients [12], self-efficacy and job satisfaction [13], professional self-efficacy and commitment [14], and clinical self-efficacy [15]. It also has a significant but negative relationship with job burnout [16]. Thus, the clinical competence of nurses working in hospitals has always been considered as a topic of interest. In this regard, Mirlashari et al. assessed the clinical competence of Iranian nurses and showed more than half of the nurses had a moderate level of clinical competence [17]. Soroush et al. revealed that the clinical competencies of Iranian nurses are at a moderate level [16]. Kim et al. found that the clinical competence of nurses in South Korea is above the average [18]. Jiang et al. also indicated that Chinese nurses had moderate to low levels of clinical competence [19].

The empirical evidence indicates that a high level of clinical competence in nurses has a positive effect on their performance in health care settings. Therefore, continuous evaluation of nurses' clinical competence is one of the most important objectives that should be considered by all hospitals. Thus, the present study was designed and carried out; as there was no study assessed the clinical competency of nurses working in the critical care units of hospitals affiliated to Kermanshah University of Medical Sciences (Kermanshah, Iran). The current study was conducted to assess the clinical competency of Iranian nurses and the related demographic factors.

2. Methods

2.1. Study design

This cross-sectional study was conducted between July and August 2018, among nurses working in the hospitals affiliated to Kermanshah University of Medical Sciences (Kermanshah, Iran).

2.2. Research questions

In this study, it was sought to answer the following questions:

1) What is the level of nurses' clinical competence?
2) How frequently do the nurses use clinical competency in practice?
3) What is the relationship between the mean score of clinical competence and demographic variables?

2.3. Sample and sampling method

The statistical population in this study consisted of 260 nurses working in the critical care units of 5 hospitals affiliated to Kermanshah University of Medical Sciences (KUMS). The sample size was determined to be 155 ($n = 155$) using Cochran's sample size formula. The response rate to the questionnaires was obtained as 100%. Samples were selected by stratified random sampling. The hospitals affiliated to KUMS formed the stratum classes. Sampling was carried out in each stratum class by a random sampling method using a table of random numbers. The inclusion criteria for nurses were signing the informed consent to participate in the study, willingness to participate in the study, having at least a bachelor's degree in nursing, and having at least one year of work experience in the critical care unit.

2.4. Measurement instrument

Data collection was done using a personal information form and the Nurse Competence Scale (NCS). The personal information form consisted of 4 questions about gender, age, academic degree, and work experience. The NCS was designed by Meretoja et al. based on Benner's theory [5]. The validity and reliability of this scale were confirmed in the study by Meretoja et al. [5]. In the study by Dellai et al. the Italian version of the NCS questionnaire was validated [20]. It should be noted that this questionnaire has been translated and used in other countries including Norway, the USA, Lithuania, and Australia [21]. The Persian version of this scale has been revised in Iran and its reliability has been reported between 0.75 and 0.89 using Cronbach's α coefficient [22,23]. In the current study, the internal consistency of the questionnaire was determined using Cronbach's α coefficient ($\alpha = 0.87$).

This scale consists of 73 items and 7 subscales including helping role (7 skills), teaching-coaching (16 skills), diagnostic functions (7 skills), managing situations (8 skill), therapeutic interventions (10 skills), ensuring quality (6 skills), and work role (19 skills). In this scale, nurses evaluate their clinical competence in any skill according to the Visual Analogue Scale by self-assessment and score each item from 0 to 100. The score closer to 0 indicates a lower level of competence and the score closer to 100 indicates a higher level of competence. The frequency of using any of the skills related to clinical competence is measured based on a 4-point Likert scale including non-applicable, rarely used, occasionally used, and frequently used, scored from 0 to 3, respectively in this study. The clinical competence was classified in this study as follows: low (0–25), relatively good (26–50), good (51–75), and very good (76–100).

2.5. Data collection

To collect the information, permission was first obtained from the KUMS' Deputy for Research and Technology. Then, the

researcher attended the hospitals affiliated to KUMS and obtained the list of nurses working in the critical care units of each hospital from the nursing office. The list was numbered, and then the samples were selected according to the table of random numbers. Then, the eligible samples were contacted according to their shift schedule, and the goals of the study were explained to them. If the samples were satisfied with the explanation given to them by the researcher, they were asked to participate in the study. Then, the questionnaires were given to them to be completed and later were collected by the researcher. It should be noted that, if anyone did not want to participate in the study, he/she was replaced by the person above or below him/her in the nurses' list.

In our study, to improve the quality of data collection process, the following measures were taken: 1) The objectives of the study were expressed explicitly to the participants and their questions were answered, 2) The participants were given enough time to answer the questionnaire, 3) The questionnaire was provided to the participants at a convenient time, and 4) Questionnaires with more than 20% missing data were excluded.

2.6. Data analysis

The data collected were analyzed by the SPSS software(SPSS v.16.0; SPSS Inc., Chicago, IL, USA) using descriptive statistics(mean, standard deviation, frequency, and percentage), and inferential statistics (the independent sample *t*-test, one-way analysis of variance and spearman correlation coefficient). The independent sample *t*-test was used to compare the mean clinical competence in terms of dual-mode qualitative variables (sex, academic degree), and the one-way analysis of variance test was used to compare the mean clinical competence in terms of multimode qualitative variables(working experience, age groups). Spearman correlation coefficient was used to assess the relationship between the sub-scales of clinical competence and the total score of clinical competence. The *P*-value of less 0.05 was considered as statistically significant.

2.7. Ethical considerations

The present study was approved by the Ethics Committee of Kermanshah University of Medical Sciences with the following code: IR.KUMS.REC.1396.413.The objectives of the study were explained to all the participants, and written informed consent was obtained from all of them. The participants were also assured about the confidentiality of their specifications and responses.

3. Results

The study sample consisted of 155 nurses with a mean age of 34.52 ± 5.07 years old. Most nurses were female ($n = 119$, 76.8%), and had a Bachelor of Science (BSc.) degree ($n = 124$, 80.0%). The mean work experience year of nurses was 11.27 ± 12.57 years (Table 1). No statistically significant difference was found among the scores of clinical competence of nurses varying with different gender, age, academic degree, and work experience.

The total mean score of nurses' clinical competence was equal to 76.14 ± 1.59 out of 100, which was at a “very good” level. The mean score of using clinical competence in practice was equal to 70.38 ± 15.25 out of 100, which was at a “good level” (Table 2).

4. Discussion

The present study was conducted to assess the clinical competency of nurses and their related demographic factors. In our study, the mean clinical competence of nurses was at a very good level. Also, the clinical competence of more than half of the nurses was at a very good level. Additionally, the mean of using clinical competency by nurses was at a good level. In terms of using clinical competence in practice, about half of the nurses were at a good level. The highest level of clinical competence was related to the dimensions of “managing situations” and “ensuring quality”. The highest and lowest mean scores of using clinical competence in practice were related to the dimension of “therapeutic interventions” and “ensuring quality".

In regard to the clinical competence of nurses, our findings are in line with the findings of several studies including Kim et al. and Park & Kim studies, who assessed the clinical competence of nurses in South Korea and showed that, the clinical competence of nurses were above than the average [18,24]. Istomina et al. showed that the level of competence and the frequency of using clinical competence in practice were high among Lithuanian nurses [25]. Heydari et al. reported that the clinical competence of nurses in Iran is at good and very good levels [26]. Chang et al. showed that the clinical competence of Taiwanese nurses was at moderate and

Table 2
Scores of nurses' clinical competences and using of clinical competencies in practice(*Mean* ± *SD*).

Variables	Level of clinical competence	Using of clinical competencies in practice
Helping role	74.43 ± 4.59	72.04 ± 16.04
Teaching-coaching	75.83 ± 3.61	69.27 ± 16.17
Diagnostic functions	78.67 ± 4.03	71.09 ± 18.68
Managing situations	79.37 ± 3.55	71.31 ± 19.63
Therapeutic interventions	75.23 ± 3.99	72.25 ± 16.85
Ensuring quality	73.98 ± 5.73	68.17 ± 19.39
Work role	75.47 ± 3.14	68.53 ± 17.30
Total of clinical competence score	76.14 ± 1.59	70.38 ± 15.25

Table 1
Comparison of clinical competence in terms of demographic characteristics nurses.

Demographic variables		Number (%)	Competency scores (*Mean* ± *SD*)	*t*	*P*
Sex	Female	119 (76.8)	76.05 ± 1.71	−1.648	0.103
	Male	36 (23.2)	76.44 ± 1.07		
Age (year)	20–30	34 (21.9)	75.77 ± 1.60	1.198	0.263
	31–40	107 (69.0)	76.29 ± 1.57		
	≥41	14 (9.0)	75.87 ± 1.68		
Education	BSc.	124 (80.0)	76.07 ± 1.63	−1.026	0.306
	MSc.	31 (20.0)	76.40 ± 1.45		
Working experience (year)	1–5	37 (23.9)	76.32 ± 1.59	1.555	0.203
	6–10	42 (27.1)	76.21 ± 1.66		
	11–15	55 (35.5)	75.80 ± 1.64		
	≥16	21 (13.5)	76.58 ± 1.21		

high levels [27].

Results of a study on the intensive care unit nurses in Finnish hospitals showed that nurses' clinical competence was at a good level [7]. Results of a studyon the intensive care unit nurses in Iran indicated that more than half of the nurses had a moderate level of clinical competence [17]. Another study conducted in Iran indicated that the clinical competence of nurses in the intensive care unit was at a favorable level. But the component of "quality assurance" was at the lowest level [28]. Quality assurance is one of the main concerns of nursing managers and healthcare systems, which is concerned with making sure of the adequate level of clinical competency in nurses. Quality assurance refers to the evaluation of objectives, and participation in promoting nursing care [22]. Therefore, nursing managers should focus on the promotion of this component. In Iran, every hospital has the department of quality improvement and in-service training, which are responsible for conducting educational courses, assessing the clinical competency of nurses, and encouraging superior nurses. Regarding the high score of clinical competence obtained by nurses in our study, it can be argued that this high score could be related to many factors such as holding regular educational courses, and periodic evaluation of nurses' clinical competence. Therefore, by organizing workshops and educational courses, it is possible to provide a favorable ground for the promotion of nurses' clinical competence. For this purpose, holding virtual workshops and training courses can be very effective, as the nurses do not have much time to take part in the real training courses due to their high workload [29,30].

In our study, the mean clinical competence was at a very good level in male and female nurses, and no statistically significant relationship was found between the mean clinical competence and variable of gender. The findings of the studies by Adib-Hajbaghery & Eshraghi-arani and Habibzadeh et al. are also in line with our result [31,32]. It is believed that clinical competence is a skill that all nurses, whether men or women, should have. In this regard, the provision of educational services and counseling based on the psychological and sociological characteristics of male and female nurses can be effective.

In our study, it was found that the mean score of clinical competency was at a very good level in all age groups, but this score was slightly higher in the age group of 31–40 years old. However, this difference was not statistically significant. In a study conducted in Iran, the mean clinical competence of nurses was higher in the age group of 34 years and above than other age groups [31]. In our study, there was no significant relationship between the mean clinical competence and variable of age. This finding is consistent with the findings of the studies by Mirlashari et al. and Habibzadeh et al. [17,32], but it is not consistent with the findings of the study by Adib-Hajbaghery & Eshraghi-arani [31]. It is expected that, with the increase in the age of nurses, their clinical experience will also increase.

In our study, the mean clinical competence was higher in nurses with MSc. degree than the nurses with BSc. degree, though there was no statistically significant defference. This result may be related to the limitation of the sample size. This finding is in line with the findings of the studies by Mirlashari et al., Adib-Hajbaghery & Eshraghi-arani, and Habibzadeh et al. [17,31,32]. Therefore, it can be expected that, with the increase in the educational level of nurses, their clinical competence will also increase.

In our study, the mean clinical competence was higher in nurses with 16 years of work experience than other nurses who had less experience without statistical significance. This finding is consistent with the results of the studies by Mirlashari et al. and Adib-Hajbaghery & Eshraghi-Arani [17,31], but is not in line with the findings of the studies by Habibzadeh et al. and Takase [32,33]. Evidence suggests that working history is one of the factors influencing the clinical competence of nurses [25]. In fact, with an increase in the nurses' working history, their work experience increases. Thus, it is expected that, with an increase in the work experience, clinical competence will also increase.

There were some limitations to the current study. Our study tools were based on self-reporting method that could influence the results of the study. Therefore, it is suggested to assess nurses' clinical competence by head nurses and nursing managers in future studies. Moreover, the use of techniques such as observing nurses' performance in the workplace can be effective to more precisely assess the clinical competency of nurses. Due to the influence of various external and internal factors on clinical competence, the findings of our study may not be generalized to other contexts.

5. Conclusions

The results of our study indicated that the clinical competence of Iranian nurses was at a very good level as a self-reported result, and the frequency of using clinical competence in practice was at a good level. No significant difference was found between the mean clinical competence of nurses and the variables of gender, age, academic degree, and work experience. Therefore, the research hypothesis was rejected. Awareness about the level of clinical competency of nursing staff can be used by policymakers and nurse educators as well as health care providers to implement interventional measures if necessary to promote the nurses' clinical competencies. Considering the importance of clinical competence in nursing staff, it is essential for hospital nursing managers to consider the factors influencing nurses' clinical competencies such as social/psychological and organizational factors. By using new educational approaches such as e-learning and continuous training, we can increase the clinical competence of nurses. Furthermore, continuous assessment of nurses' clinical competence by standard tools can also be highly beneficial. Further studies are recommended to investigate the factors influencing the clinical competencies of nurses. In general, increasing the quality of nurses' performance in the healthcare system requires regular and continuous planning to increase their clinical competence.

Conflicts of interest

The authors declare there is no conflict of interest.

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Authors' contribution

AF, MK, SMA, MJ and AK contributed to designing the study, MJ and MK collected the data. AK and SMA analyzed the data, and AF, MK, SMA, MJ and AK wrote the final report and manuscript. All the authors read and approved the version for submission.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijnss.2019.09.007.

References

[1] Kemppainen V, Tossavainen K, Turunen H. Nurses' roles in health promotion practice: an integrative review. Health Promot Int 2013;28(4):490–501. https://doi.org/10.1093/heapro/das034.

[2] Karami A, Farokhzadian J, Foroughameri G. Nurses' professional competency and organizational commitment: is it important for human resource management? PLoS One 2017;12(11):e0187863. https://doi.org/10.1371/journal.pone.0187863.

[3] Levett-Jones T, Gersbach J, Arthur C, Roche J. Implementing a clinical competency assessment model that promotes critical reflection and ensures nursing graduates' readiness for professional practice. Nurse Educ Pract 2011;11(1):64–9. https://doi.org/10.1016/j.nepr.2010.07.004.

[4] Ghanbari A, Hasandoost F, Lyili EK, Khomeiran RT, Momeni M. Assessing emergency nurses' clinical competency: an exploratory factor analysis study. Iran J Nurs Midwifery Res 2017;22(4):280. https://doi.org/10.4103/1735-9066.212990.

[5] Meretoja R, Isoaho H, Leino-Kilpi H. Nurse competence scale: development and psychometric testing. J Adv Nurs 2004;47(2):124–33.

[6] Manoochehri H, Imani E, Atashzadeh-Shoorideh F, Alavi-Majd A. Competence of novice nurses: role of clinical work during studying. J Med Life 2015;8(4):32.

[7] Lakanmaa R-L, Suominen T, Ritmala-Castrén M, Vahlberg T, Leino-Kilpi H. Basic competence of intensive care unit nurses: cross-sectional survey study. BioMed Res Int 2015;2015. https://doi.org/10.1155/2015/536724.

[8] Nobahar M. Competence of nurses in the intensive cardiac care unit. Electron Physician 2016;8(5):2395. https://doi.org/10.19082/2395.

[9] Yavari M, Ardhali SH, Moeni M. Evaluation of Intensive Care Unit in terms of standards of care in selected hospitals in Tehran. J Med Council Islam Republic Iran 2015;33(2):131–7.

[10] Tabriz ER, Orooji A, Bikverdi M. Investigation clinical competence and its relationship with professional Ethics and spiritual health in nurses. Health 2017;4(1):2–9.

[11] Dehghan Nayeri N, Jafarpour H. Relationship between clinical competence and motivation needs of nurses based on the McClelland theory. Nursing Practice Today 2015;1(2):86–92.

[12] Jahanshahi Z, Sarabi AG, Borhani F, Nasiri M, Anboohi SZ. The correlation between the clinical competency and empathy of nurses: case study, Intensive Care Units of the educational hospitals of Kerman Medical Sciences University, Iran. Ann Trop Med Public Health 2017;10(3):694.

[13] Park MS, Jeoung Y, Lee HK, Sok SR. Relationships among communication competence, self-efficacy, and job satisfaction in Korean nurses working in the emergency medical center setting. J Nurs Res 2015;23(2):101–8. https://doi.org/10.1097/JNR.0000000000000059.

[14] Tsai C-W, Tsai S-H, Chen Y-Y, Lee W-L. A study of nursing competency, career self-efficacy and professional commitment among nurses in Taiwan. Contemp Nurse 2014;49(1):96–102. https://doi.org/10.5172/conu.2014.49.96.

[15] Mohamadirizi S, Kohan S, Shafei F, Mohamadirizi S. The relationship between clinical competence and clinical self-efficacy among nursing and midwifery students. Int J Pediatr 2015;3(6):1117–23. https://doi.org/10.22038/IJP.2015.5222. 2.

[16] Soroush F, Zargham-Boroujeni A, Namnabati M. The relationship between nurses' clinical competence and burnout in neonatal intensive care units. Iran J Nurs Midwifery Res 2016;21(4):424. https://doi.org/10.4103/1735-9066.185596.

[17] Mirlashari J, Qommi R, Nariman S, Bahrani N, Begjani J. Clinical competence and its related factors of nurses in neonatal intensive care units. J Caring Sci 2016;5(4):317. https://doi.org/10.15171/jcs.2016.033.

[18] Kim K, Han Y, Kwak Y, Kim J-s. Professional quality of life and clinical competencies among Korean nurses. Asian Nurs Res 2015;9(3):200–6. https://doi.org/10.1016/j.anr.2015.03.002.

[19] Jiang L, He HG, Zhou WG, Shi SH, Yin TT, Kong Y. Knowledge, attitudes and competence in nursing practice of typhoon disaster relief work among C hinese nurses: a questionnaire survey. Int J Nurs Pract 2015;21(1):60–9. https://doi.org/10.1111/ijn.12214.

[20] Dellai M, Mortari L, Meretoja R. Self-assessment of nursing competencies–validation of the Finnish NCS instrument with Italian nurses. Scand J Caring Sci 2009;23(4):783–91. https://doi.org/10.1111/j.1471-6712.2008.00665.x.

[21] Finnbakk E, Wangensteen S, Skovdahl K, Fagerström L. The Professional Nurse Self-Assessment Scale: psychometric testing in Norwegian long term and home care contexts. BMC Nurs 2015;14(1):59. https://doi.org/10.1186/s12912-015-0109-3.

[22] Bahreini M, Moattari M, Kaveh MH, Ahmadi F. A comparison of nurses' clinical competences in two hospitals affiliated to shiraz and boushehr universities of medical Sciences: a self-assessment. Iran J Med Educat 2010;10(2).

[23] Bahreini M, Shahamat S, Hayatdavoudi P, Mirzaei M. Comparison of the clinical competence of nurses working in two university hospitals in Iran. Nurs Health Sci 2011;13(3):282–8. https://doi.org/10.1111/j.1442-2018.2011.00611.x.

[24] Park J-A, Kim B-J. Critical thinking disposition and clinical competence in general hospital nurses. J Kor Acad Nurs 2009;39(6). https://doi.org/10.4040/jkan.2009.39.6.840.

[25] Istomina N, Suominen T, Razbadauskas A, Martinkėnas A, Meretoja R, Leino-Kilpi H. Competence of nurses and factors associated with it. Medicina 2011;47(4):33.

[26] Heydari A, Kareshki H, Armat MR. Is nurses' professional competence related to their personality and emotional intelligence? a cross-sectional study. J Caring Sci 2016;5(2):121. https://doi.org/10.15171/jcs.2016.013.

[27] Chang MJ, Chang YJ, Kuo SH, Yang YH, Chou FH. Relationships between critical thinking ability and nursing competence in clinical nurses. J Clin Nurs 2011;20(21-22):3224–32. https://doi.org/10.1111/j.1365-2702.2010.03593.x.

[28] Kalantary S, Kord F, Kazemi SB, Rahimian Sh, Araghianmojarad F, Jalali T. Determination of nurses' clinical competence in critical care ward in Golestan hospital. Nurs Dev Health 2016;7(49–56).

[29] Khatony A, Nayery ND, Ahmadi F, Haghani H, Vehvilainen-Julkunen K. The effectiveness of web-based and face-to-face continuing education methods on nurses' knowledge about AIDS: a comparative study. BMC Med Educ 2009;9(1):41. https://doi.org/10.1186/1472-6920-9-41.

[30] Liu W-I, Rong J-R, Liu C-Y. Using evidence-integrated e-learning to enhance case management continuing education for psychiatric nurses: a randomised controlled trial with follow-up. Nurse Educ Today 2014;34(11):1361–7. https://doi.org/10.1016/j.nedt.2014.03.004.

[31] Adib Hajbaghery M, Eshraghi Arani N. Assessing nurses' clinical competence from their own viewpoint and the viewpoint of head nurses: a descriptive study. Iran J Nurs 2018;31(111):52–64.

[32] Habibzadeh H, Mohamadpor Y, Khalkhali H, Ghorbanzade K. The relationship betweennurses'quality of work life and their clinical competency. J Urmia Nurs Midwifery Facult 2012;10(3):332–9.

[33] Takase M. The relationship between the levels of nurses' competence and the length of their clinical experience: a tentative model for nursing competence development. J Clin Nurs 2013;22(9–10):1400–10. https://doi.org/10.1111/j.1365-2702.2012.04239.x.