

RESEARCH

Open Access



Nurses' clinical competency and its correlates: before and during the COVID-19 outbreak

Tian Hui¹, Mohammad Ali Zakeri^{2,3} , Yaser Soltanmoradi⁴ , Neda Rahimi⁵,
Sayed Mortaza Hossini Rafsanjanipoor² , Majid Nouroozi⁶ and Mahlagha Dehghan^{7,8*}

Abstract

Background Clinical competency is the ability to integrate knowledge, skills, attitudes and values into a clinical situation and it is very important in nursing education, clinical settings, nursing management, and crises. This study aimed to investigate nurses' professional competence and its correlates before and during the COVID-19 pandemic.

Methods We conducted this cross-sectional study before and during the COVID-19 outbreak and recruited all nurses working in hospitals affiliated to Rafsanjan University of Medical Sciences, southern Iran, so we included 260 and 246 nurses in the study before and during the COVID-19 epidemic, respectively. Competency Inventory for Registered Nurses (CIRN) was used to collect data. After inputting the data into SPSS24, we analysed them using descriptive statistics, chi-square and multivariate logistic tests. A significant level of 0.05 was considered.

Results The mean clinical competency scores of nurses were 156.97 ± 31.40 and 161.97 ± 31.36 before and during the COVID-19 epidemic, respectively. The total clinical competency score before the COVID-19 epidemic was not significantly different from that during the COVID-19 epidemic. Interpersonal relationships ($p=0.03$) and desire for research/critical thinking ($p=0.01$) were significantly lower before the COVID-19 outbreak than during the COVID-19 outbreak. Only shift type had an association with clinical competency before the COVID-19 outbreak, while work experience had an association with clinical competency during the COVID-19 epidemic.

Conclusion The clinical competency among nurses was moderate before and during the COVID-19 epidemic. Paying attention to the clinical competence of nurses can improve the care conditions of patients, and nursing managers should improve the clinical competence of nurses in different situations and crises. Therefore, we suggest further studies identifying factors improving the professional competency among nurses.

Keywords Study, Nursing, COVID-19, Professional competence

*Correspondence:

Mahlagha Dehghan

m_dehghan86@yahoo.com; m_dehghan@kmu.ac.ir

Full list of author information is available at the end of the article



© The Author(s) 2023. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

Introduction

The COVID-19 disease appeared in Wuhan, China in December 2019 and spread rapidly to other Chinese regions and countries [1]; This disease caused many challenges in various people, both patients and other people, and caused a wave of panic among health workers [2–4]. Iran is one of the first ten countries contaminated by this disease [5]. These conditions highlighted the need for proper response of medical staff and hospitals to incidents caused by crises [6, 7]. On the other hand, attention to risk assessment and analysis of the type of health care should be considered [8–10].

The high prevalence of SARS-Cov-2 indicates the importance of clinical competency among health professionals [11]. Studies suggest that nurses are unready, shocked, and confused in emergency situations [12]; therefore, it is important to increase their clinical competency. Clinical competence is one of the important components of nursing care, which has received more attention from health managers [13–15]. Nurses' clinical competency is a significant issue in various medical fields, with several factors having roles in paying attention to clinical competence among nurses, including rapid changes in healthcare systems, the need to provide safe and cost-effective services, improvement of the level of community health awareness, expectations for receiving higher quality services, and the desire of health organizations to use competent health workforce. Clinical competency includes moral and value dimensions and represents science and skill; honesty, accuracy, communication skills, and adaptability are the main indicators of professional competence [16, 17].

Clinical competence is to use technical and communication skills, knowledge, clinical reasoning, emotions and values in clinical settings. It also refers to the ability to carry out professional functions effectively in the area of practice [18–20]. The World Health Organization (WHO) refers to providing quality health services at different levels [21], and clinical competence has been an important factor in patients' surgical results, safety, and satisfaction [22]. According to research, an increase in clinical competence increases patient satisfaction [23], and it has a relationship with critical thinking and the level of organizational commitment [24, 25]. Individual and organizational factors affecting nurses' competences include knowledge and skill, observance of professional ethics, respectful interaction with colleagues, work experience, appropriate communication, interest in the profession and responsibility, educational and clinical setting, and an efficient educational system [26]. Najafi et al. (2022) considered work experience, age, clinical experience in the current ward, higher education level, work while studying, and emotional intelligence as the

personal factors affecting nurses' clinical competences. They found that the environmental-organizational factors, identification of patients' culture and provision of care based on their culture, job satisfaction and consultation with colleagues were effective on nurses' clinical competences [19]. However, clinical competence may change in emergency situations and crises. The impact of COVID-19 on educational processes, curriculum, and medical education programs has been identified, which can affect competency in care [27].

The COVID-19 outbreak led to a public health emergency of international concern and mainly affected healthcare workers, particularly nurses. Studies reported many mental disorders in healthcare workers and nurses working in high-risk settings, such as anxiety, social problems [28], posttraumatic stress [29], anger, mental health problems [30, 31] and burnout [32], which in turn affected clinical practice and competence among nurses. The COVID-19 pandemic challenged frontline nurses' personal and professional lives; they were at risk of the COVID-19 disease due to daily nursing care and direct contact with patients, underwent heavy workload, and faced problems in their daily lives [33, 34]. A study in China indicated that nurses perceived the knowledge of COVID-19 well, but most of them lacked work experience in isolation and coronavirus wards, which in turn affected their clinical competences [35]. Since nursing competence plays an important role in the quality of nursing services, particularly in crises, it is crucial to evaluate clinical competency and its correlates during the COVID-19 pandemic. Healthcare systems can use such evaluations to increase their awareness because these evaluations present useful information to address gaps in knowledge and skills and help nurses provide better and more comprehensive care during pandemics. Therefore, the present study aimed to investigate nurses' professional competences and their correlates before and during the COVID-19 pandemic in order to gain a better insight into the factors affecting the professional competencies of nurses in crises in order to increase it.

Method

Study design and setting

This cross-sectional study investigated nurses' clinical competences before and during the COVID-19 outbreak in public hospitals (Ali-Ibn Abi-Talib and Moradi) in Rafsanjani, southern Iran.

Sample size and sampling

Sampling was performed before (from February to May 2019) and during the COVID-19 outbreak (from February to May 2021) by census method. The study population consisted of 435 nurses before the COVID-19

outbreak and 510 frontline nurses during the outbreak in Ali-Ibn Abi-Talib hospitals in Rafsanjan. Nurses in charge of direct care of patients, nurses with one year of experience, and nurses who had clinical experience for at least three months met the inclusion criteria. The exclusion criteria were a history of mental disorders in nurses and an incomplete questionnaire.

Three hundred seven nurses completed the questionnaires before the COVID-19 outbreak, but 260 questionnaires were included in the study after removal of the high missing value (47 questionnaires). Therefore, the effective response rate of frontline nurses before the COVID-19 outbreak was 59.77%. Two hundred and eighty-four nurses completed questionnaires during the COVID-19 outbreak, of which thirty-eight questionnaires were removed due to high missing value. The effective response rate of frontline nurses during the COVID-19 outbreak was 48.23% ($n=246$); the data of 506 nurses were used in the final analysis. After obtaining the necessary permits, one of the researchers interviewed nurses at their workplaces to complete clinical competency questionnaire.

Measurement

Socio-demographics

Socio-demographic information questionnaire included gender, age, marital status, education level, type of employment, income, work experience, shift type, ward type in department, amount of overtime, and history of illness.

Competency Inventory for Registered Nurses (CIRN)

The 55-item CIRN was developed and used by Liu et al. in China (Macau, China) to assess the nurses' clinical competence in different clinical settings. The inventory includes 7 dimensions: a) clinical care (10 items: 2, 3, 5, 9, 12, 15, 20, 24, 27 and 38), b) leadership (9 items: 13, 14, 28, 32, 33, 36, 39, 43 and 48), c) interpersonal relationships (8 items: 4, 18, 22, 23, 30, 34, 35 and 54), d) ethical/legal performance (8 items: 10, 11, 25, 31, 37, 44, 45 and 49), e) professional development (6 items: 6, 26, 29, 52, 53, and 55), f) coaching/training (6 items: 8, 17, 19, 40, 41 and 46), and g) desire for research / critical thinking (8 items: 1, 7, 16, 21, 42, 47, 50 and 51). The CIRN was scored on a five-point Likert scale ranging from 0 to 4 (0=lack of competence, 1=low competency, 2=limited competency, 3=sufficient competence, and 4=very high competence), with a higher score indicating a higher competency (high competency: 165–220, moderate competency: 110–165, and low qualification: less than 110). The total score of this questionnaire varies from 0 to 220.

Liu et al. reported Cronbach's alpha coefficient of 0.908 (ranging from 0.718 to 0.903) for the internal consistency

of CIRN questionnaire [36]. Ghasemi et al. (2014) in Iran translated this questionnaire into Persian and confirmed its validity and reliability by Cronbach's alpha coefficient of 0.87 for the whole CIRN questionnaire (0.88–0.97 for subscales) [37]. According to Zakeri et al. (2021), Cronbach's alpha coefficients for clinical care, leadership, interpersonal relationships, ethical/legal performance, professional development, coaching/training, desire for research/critical thinking and the overall scale were 0.88, 0.86, 0.85, 0.82, 0.84, 0.83, 0.84 and 0.97, respectively [38]. In the present study, Cronbach's alpha coefficients for the CIRN questionnaire was 0.94.

Data collection

After obtaining the necessary permits, the researcher went to the Ali-Ibn Abi-Talib Hospital in Rafsanjan city and started sampling. All eligible people were invited to participate in the study and they were asked to complete the questionnaire when they were ready. The data collection process was done during office hours and when the nurses had enough time to complete the questionnaire. The participant could answer the questions with the interviewer. Ali-Ibn Abi-Talib Hospital was the only hospital in Rafsanjan city dedicated to the care of COVID-19 patients.

Statistical analysis

We input the data into SPSS 24 to analyze them. Frequency, percentage, mean and standard deviation were used to define the dimensions of clinical competence and demographic characteristics. Independent t test was used to comparison of the clinical competency and its dimensions before and during the COVID-19 among nurses. Multivariate logistic regression was used to investigate the relationship between the variables of analysis and clinical competence of nurses. Significance level was considered to be 0.05.

Results

The samples before the COVID-19 outbreak included 260 nurses with a mean age of 32.98 ± 6.13 years. Most of them were female ($n=214$, 82.3%), married ($n=221$, 85.0%), employed ($n=157$, 60.3%), had a bachelor's degree in nursing ($n=235$, 90.4%), rotating shifts (236, 90.8%), and 5–10 years of work experience (122, 46.9%). The samples during the COVID-19 outbreak included 246 nurses with a mean age of 35.85 ± 7.68 years. Most of them were female ($n=166$, 67.5%), married ($n=183$, 74.4%), employed ($n=134$, 54.5%), had a bachelor's degree in nursing ($n=211$, 85.8%), rotating shifts (203, 82.5%), and 31–60 h of overtime per month (95, 38.7%) (Table 1).

Table 1 The relationship between participants’ demographic characteristics and clinical competency (before and during the COVID-19)

Group	Before COVID-19 (n = 260)			During COVID-19 (n = 246)		
	Frequency (Valid percent)	Mean (SD)	Statistical test/P value	Frequency (Valid percent)	Mean (SD)	Statistical test/P value
Gender						
Male	46 (17.7)	155.28 (28.89)	t = -0.40 (0.68)	80 (32.5)	158.00 (30.09)	t = -1.37 (0.17)
Female	214 (82.3)	157.34 (31.97)		166 (67.5)	163.88 (32.15)	
Age (yr.)						
≤ 30	99 (38.1)	154.22 (33.60)	t = -1.11 (0.26)	73 (29.7)	156.08 (26.98)	t = -2.07 (0.04)
> 30	161 (61.9)	158.67 (29.95)		173 (70.3)	164.45 (33.06)	
Marital status						
Married	221 (85.0)	156.43 (34.68)	t = -0.11 (0.90)	183 (74.4)	155.85 (28.43)	t = -1.79 (0.07)
Unmarried/other	39 (15.0)	157.07 (30.87)		63 (25.6)	164.07 (32.37)	
Education level						
Bachelor	235 (90.4)	157.39 (31.23)	t = 0.65 (0.51)	211 (85.8)	161.32 (31.72)	t = -0.79 (0.42)
Masters	25 (9.6)	153.08 (33.40)		35 (14.2)	165.88 (30.73)	
Type of employment						
Hired	157 (60.3)	157.68 (30.38)		134 (54.5)	163.38 (33.39)	F = 0.32 (0.73)
Contract recruiters ^a	68 (26.2)	159.07 (33.09)	H = 1.87 (0.39)	87 (35.4)	160.08 (30.20)	
Committed ^b	35 (13.5)	149.71 (32.46)		25 (10.2)	160.96 (26.34)	
Income (Million Toman)						
< 4	105 (40.4)	153.93 (34.75)	F = 1.10 (0.33)	16 (6.5)	171.37 (23.43)	F = 0.78 (0.46)
4 – 7	136 (52.3)	158.33 (28.27)		77 (31.3)	160.70 (31.97)	
> 7	19 (7.3)	164.05 (33.15)		153 (62.2)	161.62 (32.09)	
Work experience (yr.)						
< 5	75 (28.8)	156.17 (33.93)	F = 2.11 (0.09)	65 (26.4)	161.76 (27.00)	F = 3.32 (0.02)
5 -10	122 (46.9)	153.22 (30.05)		63 (25.6)	153.92 (30.15)	
11 – 15	35 (13.5)	163.74 (29.39)		63 (25.6)	161.46 (35.16)	
> 15	28 (10.8)	167.00 (30.68)		55 (22.4)	172.01 (31.83)	
Shift type						
Fixed	24 (9.2)	168.50 (30.53)	t = 1.89 (0.05)	43 (17.5)	160.79 (35.35)	t = -0.27 (0.78)
Rotating	236 (90.8)	155.80 (31.31)		203 (82.5)	162.22 (30.78)	
Ward						
Critical/intensive	73 (28.1)	158.35 (30.23)	H = 2.18 (0.33)	56 (22.8)	165.32 (29.64)	H = 0.92 (0.63)
Emergency	146 (56.1)	158.13 (32.22)		155 (63.0)	161.66 (31.92)	
Medical	41 (15.8)	150.41 (30.40)		35 (14.2)	157.97 (33.23)	
Overtime (h)						
0 – 30	24 (9.2)	162.83 (29.82)	F = 1.21 (0.30)	33 (13.4)	156.78 (28.09)	F = 1.09 (0.35)
31 – 60	59 (22.7)	158.20 (31.38)		95 (38.7)	163.62 (32.34)	
61 – 90	142 (54.6)	157.60 (31.96)		81 (32.9)	159.22 (32.13)	
> 90	35 (13.5)	148.34 (29.82)		37 (15.0)	168.37 (31.01)	
Illness						
Yes	41 (15.8)	162.46 (32.97)	t = 1.22 (0.22)	48 (19.5)	159.75 (32.67)	t = -0.54 (0.58)
No	73 (84.2)	155.94 (31.07)		198 (80.5)	162.51 (31.34)	

SD Standard Deviation, t Independent t test, F Analysis of variance, H Kruskal–Wallis H, a Annually contracted with payment similar to hired nurses, b It is obligatory to work for government for two years at a lower rate of pay

The mean scores of nurses’ clinical competency before and during the COVID-19 were 156.97 ± 31.40 and 161.97 ± 31.56 , respectively, with clinical care and professional development subscales receiving the highest and lowest scores. The interpersonal relationships ($p=0.03$) and desire for research/critical thinking

($p=0.01$) scores were significantly lower before the COVID-19 outbreak than during the COVID-19 outbreak. The nurses' total clinical competency scores did not change significantly before and during the COVID-19 outbreak ($p>0.05$) (Table 2). Before the COVID-19 outbreak, 11.9% had low, 52.7% had moderate, and 35.4% had high level of clinical competency, while during the COVID-19 outbreak, 5.7% had low, 52% had moderate, and 42.3% had high level of clinical competency ($\chi^2=5.66, p=0.01$) (Fig. 1).

We found no significant difference in demographic characteristics and clinical competency before the COVID-19 outbreak, while age and work experience had a significant association with clinical competency during

the COVID-19 outbreak ($p=0.009$) (Table 1). We used multiple regression with backward method for further analysis and included all variables with p -value <0.3 in the multivariate regression model. The results indicated a relationship between shift type and clinical competency before the COVID-19 outbreak, as well as between work experience and clinical competency during the COVID-19 outbreak (Table 3).

Discussion

The present study aimed to investigate nurses' professional competency and its correlates before and during the COVID-19 pandemic. The study results indicated no significant difference in the total scores of nurses' clinical

Table 2 Comparison of the clinical competency and its dimensions before ($n=260$) and during the COVID-19 ($n=246$)

Group Variables	Before COVID-19			During COVID-19			Independent t test	Effect size	P value
	Median	Mean	SD	Median	Mean	SD			
Clinical care	29.0	28.39	6.28	30.0	29.39	6.12	-1.82	0.16	0.06
Leadership	27.0	26.51	5.00	27.0	27.15	5.34	-1.37	0.12	0.17
Interpersonal relationships	23.0	23.03	5.02	24.0	23.94	4.68	-2.11	0.18	0.03
Ethical/legal performance	23.0	22.90	4.57	24.0	23.69	4.89	-1.87	0.16	0.06
Professional development	17.0	16.74	3.97	17.0	16.86	4.38	-0.31	0.02	0.75
Coaching/training	18.0	17.16	3.69	18.0	17.64	3.74	-1.45	0.12	0.14
Desire for research/critical thinking	23.0	22.21	5.00	23.0	23.28	4.84	-2.42	0.21	0.01
Total Clinical Competency	159.0	156.97	31.40	162.0	161.97	31.56	-1.78	0.15	0.07

SD Standard Deviation

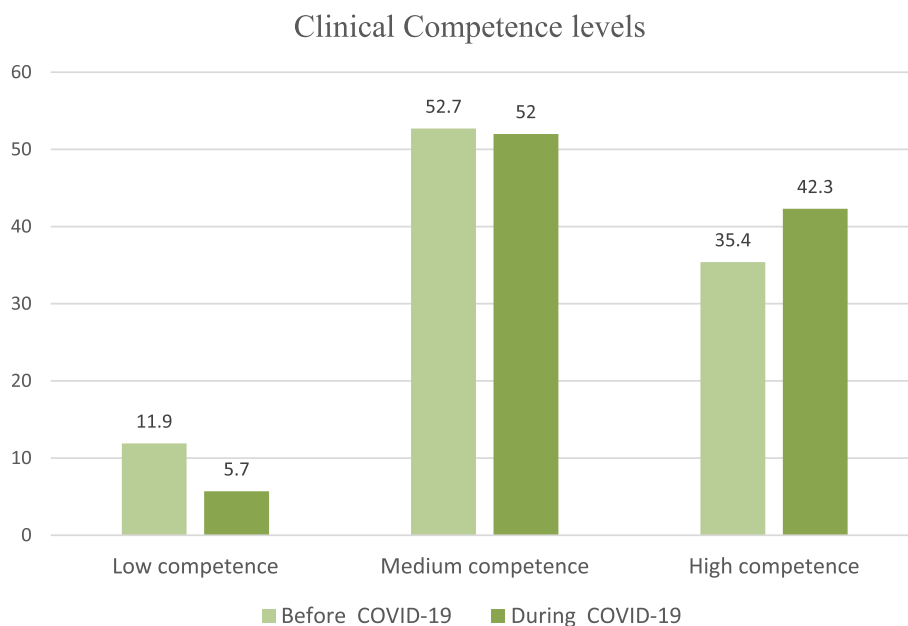


Fig. 1 The comparison of the levels of clinical competency before and during the COVID-19

Table 3 Multiple models of the associations between variables and clinical competency before and during the COVID-19 outbreak

Variable			B	SE ^a	β	T	P	95% CI Lower	95% CI Upper	R ²
Clinical competency	Before COVID-19	Constant	191.95	14.19	-	13.52	< 0.001	163.99	219.90	% 2
		Shift type	-13.37	6.67	-0.12	-2.00	0.046	-26.52	-0.22	
		Overtime	-0.133	0.07	-0.11	-1.79	0.074	-0.27	0.01	
	During COVID-19	Constant	151.01	11.08	-	13.62	< 0.001	129.18	172.85	% 2.6
		Work experience	5.14	1.93	0.181	2.65	0.009	1.32	8.96	
		Gender	7.88	4.30	0.117	1.83	0.068	-0.58	16.36	
		Income	-5.78	3.47	-0.113	-1.66	0.097	-12.62	1.05	

^a Standard error; CI, Confidence intervals for B; Work experience (1 = > 5, 2 = 5 - 10, 3 = 11 - 15, 4 = > 15); Shift type (1 = Fixed and 2 = Not fixed)

competence before and during the COVID-19 epidemic and nurses received moderate clinical competence in both situations. Ahmadi et al. (2022) supported our results and reported nurses' moderate clinical competence in the COVID-19 wards [21], but Alan et al. (2022) in Turkey found that nurses' professional competences in the COVID-19 wards were above the average level [39]. Different results may be due to the different research settings, hospital conditions, nurses' working conditions in the wards, and managers' supports from nurses in different dimensions during the epidemic.

Faraji et al. (2019) [40] and Jalali et al. (2019) [41], as well as Kalantary et al. (2016) [42] reported a high level of clinical competence among Iranian nurses working in intensive care units. Kajander-Unkuri et al. (2014) revealed good level of the clinical competence in newly graduated nursing students [43], but these studies were not consistent with the present study. Nurses' low clinical competence in our study may be due to their problems during the COVID-19 epidemic and their lack of time to acquire professional skills to care for these patients [44].

Low clinical competence among nurses working in the COVID-19 wards can be due to stressful working conditions, high patient mortality rates, and the need to have high skills. Labrague et al. (2021) reported an association between fears of COVID-19, decreased job satisfaction, and increased psychological distress. They mentioned a high level of fear of COVID-19 among nurses, who were not full-time and did not attend COVID-19 training courses. Labrague argued that nurses working in COVID-19 wards were at a higher risk of infection than the general population, so they were more afraid of transmitting the disease to their family members and friends. An increase in the number of admitted patients, social distancing, and quarantine might exacerbate this condition and affected clinical skills [45].

An important point in our study was that we found no difference in nurses' clinical competences before and after the COVID-19 epidemic and their clinical

competences did not decrease during the COVID-19 outbreak. This result suggests that nurses do their best to take care of patients even in critical conditions. Jang and Cho (2022) reported disaster nursing competencies correlated with age, nursing career, compassion satisfaction, and secondary traumatic stress [46]. Arshadi Bostanabad et al. (2022) reported clinical competency has been tied to nurse health and quality of care [47]. The review of the literature showed that although some studies have mentioned the clinical qualifications of nurses in the COVID-19 epidemic, no comparison has been made with before the crisis of the COVID-19, so there is a need for further investigation in this regard.

Our results indicated that the subscales of clinical care and professional development received the highest and lowest scores, respectively. The scores of interpersonal relationships and desire for research/critical thinking before the COVID-19 outbreak were significantly lower than that during the COVID-19 outbreak. Ahmadi et al. (2022) and Saadati et al. (2018) supported our results [21, 48]. Therefore, the ability to become empowered in clinical care was very important from nurses' perspectives, but their low scores of professional developments indicate that they must become empowered in other dimensions, particularly during the epidemics and crises because they spend most of their time taking care of patients and ignore other areas.

However, Fotohi et al. (2019) did not confirm our results because personal management and practical competence, and desire for research received the highest and lowest scores in their study [49]. Kalantary et al. (2016) did not support our study and reported that the quality assurance and occupational and organizational duties had the lowest and highest scores, respectively [42]. They did not conduct their study during the COVID-19 pandemic that might have a positive effect on nurses' practices, so the nurses participating in the present study focused on clinical care more. Another reason for different results is that nurses may set different priorities based

on their positions, type of hospital, type of management governing their workplaces and the wards where they are working.

The study results showed an association between shift type and clinical competence before the COVID-19 outbreak, as well as between work experience and clinical competence during the COVID-19 outbreak. Keshavarzi et al. (2021) demonstrated that the type of shift work had a significant relationship with nurses' overall clinical skills in neonatal intensive care units [50] (36). Arshadi Bostanabad et al. (2022) found a positive and significant relationship between the clinical competence and work experience of the nurses working in the intensive care unit who cared for patients with COVID-19 [51]. Faraji et al. (2019) also indicated a significant relationship between work experience and clinical competence [40]. Manoochehri et al. (2015) studied the clinical competence among nurses working in the hospitals affiliated to Hormozgan University of Medical Sciences in southern Iran and reported that experienced nurses were more clinically competent than novice nurses [52]. Liou et al. (2013) revealed that work experience increased clinical competence [53]; Istomina et al. (2011) believed that nurses' experience and training led to their professional developments, strengthened their learning, and increased their skills [54]. Blomberg et al. (2019) demonstrated that work experience insured development of clinical competency [55]. When allocating patients with sensitive conditions in different wards, including COVID-19, nurse managers must remember that nurses with more work experiences will be more clinically competent.

However, Bahreini et al. (2011) reported no significant relationship between work experience and clinical competence [56]. As studies on the COVID-19 are limited, further studies are necessary to determine the correlation between work experience and clinical competence during the COVID-19 outbreak. Qualitative studies with the aim of discovering the roots of unexpected results can be useful.

Limitations

This study had some limitations: we studied nurses living in a city in southeastern Iran, so the generalization of the results to other societies should be done with caution due to the cultural and social differences. Another limitation was the economic, social and cultural conditions of the participants, which were beyond our control. In the review of the literature, it was found that no study was found to examine the clinical qualifications of nurses during and before the COVID-19 outbreak, so caution should be taken in interpreting the results.

Conclusion

According to the study results, work experience can be one of the factors influencing the clinical competence among nurses. Nursing as a clinical discipline is developing and nurses are key members in various settings. Nurses must maintain their professional competences and evaluate and prioritize their clinical competence indicators to improve the healthcare system. Evaluation of clinical competence is particularly important in critical situations, which can improve patients' condition. Therefore, we suggest policymakers and nurse managers recognizing and increasing nurses' clinical competences, particularly in critical situations so that they can provide more correct and effective care to the patients. Future studies should focus on the recognition of factors and critical conditions affecting the clinical competence of nurses.

Acknowledgements

The authors thank the Clinical Research Development Unit, Ali-Ibn Abi-Talib Hospital, Rafsanjan University of Medical Sciences, Rafsanjan, Iran, for its support and collaboration.

Authors' contributions

M.A.Z., M.D., and N.R. contributed to the study design. M.A.Z., M.D., and T.H. provided critical feedback on the study and statistical analysis, and inputted to the draft of this manuscript. Y.S., S.M.H.R., and M.N. collected data. All authors have read and approved the final manuscript.

Funding

None.

Availability of data and materials

The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

All study protocols were approved by Ethical Committee of Rafsanjan University of Medical Sciences (IR.RUMS.REC.1397.213 and IR.RUMS.REC.1399.262). Nurses were given the necessary explanations about the study goals and importance, compliance with ethical requirements, voluntary participation and information confidentiality. After giving the necessary explanations, we received informed consent from the study participants, who then completed the questionnaires. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹Affiliated Hospital of Jiangnan University, Wuxi 214122, China. ²Social Determinants of Health Research Center, Rafsanjan University of Medical Sciences, Rafsanjan, Iran. ³Non-Communicable Diseases Research Center, Rafsanjan University of Medical Sciences, Rafsanjan, Iran. ⁴Faculty Member, School of Paramedicine, Department of Operating Room Technology, Rafsanjan University of Medical Sciences, Rafsanjan, Iran. ⁵Department of Surgical Nursing, Nursing and Midwifery School, Rafsanjan University of Medical, Rafsanjan, Iran. ⁶Clinical Research Development Unit, Ali-Ibn Abi-Talib Hospital, Rafsanjan University of Medical Sciences, Rafsanjan, Iran. ⁷Nursing Research Centre, Kerman

University of Medical Sciences, Kerman, Iran. ^aDepartment of Critical Care Nursing, Razi Faculty of Nursing and Midwifery, Kerman University of Medical Sciences, Haft-Bagh Highway, Kerman, Iran.

Received: 3 January 2023 Accepted: 5 May 2023

Published online: 07 May 2023

References

- Zakeri MA, Ahmadiania H, HossiniRafsanjanipoor SM. Clinical and epidemiological features of COVID-19 patients in Rafsanjan County, Iran: a secondary data based study. *J Occup Health Epidemiol.* 2022;11(2):99–105. <https://doi.org/10.52547/johe.11.2.99>.
- Aminizadeh M, et al. Quality of working life and organizational commitment of Iranian pre-hospital paramedic employees during the 2019 novel coronavirus outbreak. *Int J Healthc Manag.* 2022;15(1):36–44. <https://doi.org/10.1080/20479700.2020.1836734>.
- Safi-Keykaleh M, et al. Prevalence of postpartum depression in women amid the COVID-19 pandemic: a systematic review and meta-analysis. *Int J Gynecol Obstet.* 2022;157(2):240–7. <https://doi.org/10.1002/ijgo.14129>.
- Jamebozorgi MH, et al. Nurses burnout, resilience, and its association with socio-demographic factors during COVID-19 pandemic. *Front Psychol.* 2022;12:2484. <https://doi.org/10.3389/fpsyg.2021.803506>.
- World Healthcare Organization. Coronavirusdisease (COVID-19) Pandemic. [cited 2020]; Available from: URL :<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>.
- Tavan H, et al. Development and validation of a questionnaire to measure Iranian nurses' knowledge, attitude and practice regarding disaster preparedness. *J Clin Diagnostic Res.* 2016;10(8):IC06.
- Davarani ER, et al. Response capability of hospitals to an incident caused by mass gatherings in southeast Iran. *Injury.* 2022;53(5):1722–6. <https://doi.org/10.1016/j.injury.2021.12.055>.
- Molavi-Taleghani Y, Ebrahimpour H, Sheikhbardsiri H. A proactive risk assessment through healthcare failure mode and effect analysis in pediatric surgery department. *J Comprehensive Pediatr.* 2020;11(3):e56008. <https://doi.org/10.5812/compred.56008>.
- Khademipour G, et al. Crowd simulations and determining the critical density point of emergency situations. *Disaster Med Public Health Prep.* 2017;11(6):674–80. <https://doi.org/10.1017/dmp.2017.7>.
- Sheikhbardsiri H, et al. Qualitative study of health system preparedness for successful implementation of disaster exercises in the Iranian context. *Disaster Med Public Health Prep.* 2022;16(2):500–9. <https://doi.org/10.1017/dmp.2020.257>.
- Shi Y, et al. Knowledge and attitudes of medical staff in Chinese psychiatric hospitals regarding COVID-19. *Brain Behav Immunity-Health.* 2020;4:100064. <https://doi.org/10.1016/j.bbih.2020.100064>.
- Malakoutikhah, A., et al., The psychometric properties of the Persian version of the moral injury symptoms scale-health care professionals version. *Front Psychol.* 2022: 4803. <https://doi.org/10.3389/fpsyg.2022.978572>.
- Abdollahyar A, et al. Attitudes of Iranian nurses toward spirituality and spiritual care. *J Christ Nurs.* 2019;36(1):E11–6. <https://doi.org/10.1097/CNJ.0000000000000581>.
- Sheikhbardsiri H, et al. Observance of patients' rights in emergency department of educational hospitals in south-east Iran. *Int J Hum Rights Healthc.* 2020;13(5):435–44. <https://doi.org/10.1108/IJHRH-09-2019-0072>.
- Imanipour M, et al. The effect of competency-based education on clinical performance of health care providers: a systematic review and meta-analysis. *Int J Nurs Pract.* 2022;28(1):e13003. <https://doi.org/10.1111/ijn.13003>.
- Roudbari PR, et al. The relationship between clinical competency and job satisfaction of occupational therapists in Tehran. *Sci J Rehabil Med.* 2016;5(4):36–46. <https://doi.org/10.22037/JRM.2016.1100237>.
- Cruz SA, et al. Differing perceptions of preoperative communication among surgical team members. *Am J Surg.* 2019;217(1):1–6. <https://doi.org/10.1016/j.amjsurg.2018.06.001>.
- AdibHajbaghery M, EshraghiArani 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. <https://doi.org/10.29252/ijn.31.111.52>.
- Najafi B, Nakhaee M, Vagharseyyedin S.A. Clinical competence of nurses: a systematic review study. *Quarterly J Nurs Manag.* 2022;11(1):1–9 URL: <http://ijnv.ir/article-1-927-en.html>.
- Sheikhbardsiri H, et al. Workplace violence against prehospital paramedic personnel (city and road) and factors related to this type of violence in Iran. *J Interpersonal Viol.* 2022;37(13–14):NP11683–98. <https://doi.org/10.1177/0886260520967127>.
- Rudnicka E, et al. The World Health Organization (WHO) approach to healthy ageing. *Maturitas.* 2020;139:6–11. <https://doi.org/10.1016/j.maturitas.2020.05.018>.
- Lakanmaa RL, et al. Basic competence in intensive and critical care nursing: development and psychometric testing of a competence scale. *J Clin Nurs.* 2014;23(5–6):799–810. <https://doi.org/10.1111/jocn.12057>.
- Qoljae M Q.F., M A. Correlation between nurses' clinical competence and patients' satisfaction with nursing services. *J Nurs Midwifery School (Advances in Nursing and Midwifery).* 2017;18(63):2–9.
- Jafari H, et al. The Association of Competence and Critical Thinking in the Nurses in Imam Khomeini Hospital, Affiliated to Tehran University of Medical Sciences Iran. *Iran J Nurs.* 2019;32(121):28–40. <https://doi.org/10.29252/ijn.32.121.28>.
- Khodadadei N, Salehi S. Relationship between organizational commitment and nurses' clinical competency. *Quarterly J Nurs Manag.* 2018;7(1):18–28. (Persian) <http://ijnv.ir/article-1-546-en.html>.
- Ghorbani S, et al. Evaluation of clinical competence of novice nurses from the perspective of head nurses, a cross-sectional descriptive study in Mashhad University of Medical Sciences in 2019. *Quarterly J Nurs Manag.* 2021;10(1):60–67. (Persian) <http://ijnv.ir/article-1-816-en.html>.
- Ryan MS, Holmboe ES, Chandra S. Competency-based medical education: considering its past, present, and a post-COVID-19 era. *Acad Med.* 2022;97(3):S90.
- Zakeri, M.A., et al., Mental health outcomes among health-care workers during the COVID-19 outbreak in Iran. *Mental Health Rev J.* 2021: <https://doi.org/10.1108/MHRJ-10-2020-0075>.
- HossiniRafsanjanipoor SM, et al. Iranian psychosocial status and its determinant factors during the prevalence of COVID-19 disease. *Psychol Health Med.* 2021;20:1–12. <https://doi.org/10.1080/13548506.2021.1874438>.
- Zakeri MA, et al. The relationship between frontline nurses' psychosocial status, satisfaction with life and resilience during the prevalence of COVID-19 disease. *Nurs Open.* 2021;2021:1–11. <https://doi.org/10.1002/nop2.832>.
- Abdolkarimi M, et al. Resiliency and its Relationship with Secondary Traumatic Stress among Nursing Staff during COVID-19 Pandemic. *J Kerman Univ Med Sci.* 2022;29(4):385–94. <https://doi.org/10.22062/JKMU.2022.92014>.
- Zakeri, M.A., et al., Burnout, anxiety, stress, and depression among Iranian nurses: before and during the first wave of the COVID-19 pandemic. *Front Psychol.* 2021: 789737. <https://doi.org/10.3389/fpsyg.2021.789737>.
- Tomietto, M., et al., Nursing education: challenges and perspectives in a COVID-19 age. *Profession infermieristiche.* 2020. 73(3): <http://www.profinet.net/pro3/index.php/IN/article/view/796>.
- Liu, Z., et al., Mental health status of doctors and nurses during COVID-19 epidemic in China. Available at SSRN 3551329, 2020: Available at SSRN: <https://ssrn.com/abstract=3551329> or <https://doi.org/10.2139/ssrn.3551329>.
- Li H, et al. Nurses' core emergency competencies for COVID-19 in China: a cross-sectional study. *Int Nurs Rev.* 2021;68(4):524–32. <https://doi.org/10.1111/inr.12692>.
- Liu M, et al. Competency inventory for registered nurses in Macao: instrument validation. *J Adv Nurs.* 2009;65(4):893–900.
- Ghasemi E, et al. Psychometric Properties of Persian Version of the Competency Inventory for Registered Nurse (CIRN). *Iran J Nurs.* 2014;27(87):1–13.
- Zakeri MA, et al. Is nurses' clinical competence associated with their compassion satisfaction, burnout and secondary traumatic stress? A cross-sectional study. *Nurs Open.* 2021;8(1):354–63. <https://doi.org/10.1002/nop2.636>.
- Alan H, et al. Nurses' disaster core competencies and resilience during the COVID-19 pandemic: a cross-sectional study from Turkey. *J Nurs Manag.* 2022;30(3):622–32. <https://doi.org/10.1111/jonm.13552>.

40. Faraji A, et al. Evaluation of clinical competence and its related factors among ICU nurses in Kermanshah-Iran: a cross-sectional study. *Int J Nurs Sci*. 2019;6(4):421–5. <https://doi.org/10.1016/j.ijnss.2019.09.007>.
41. Jalali A, et al. Relationship between spiritual health and clinical competency of nurses working in intensive care units. *J Health Sci Surveill Syst*. 2019;7(4):183–7. <https://doi.org/10.30476/JHSS.2020.85749.1075>.
42. Kalantary S, et al. Determination of nurses' clinical competence in critical care ward in Golestan hospital. *Dev Nurs Health*. 2016;7(1):49–56 (Persian) <http://ndhj.lums.ac.ir/article-1-113-en.html>.
43. Kajander-Unkuri S, et al. Self-assessed level of competence of graduating nursing students and factors related to it. *Nurse Educ Today*. 2014;34(5):795–801. <https://doi.org/10.1016/j.nedt.2013.08.009>.
44. Cui S, et al. Impact of COVID-19 on anxiety, stress, and coping styles in nurses in emergency departments and fever clinics: a cross-sectional survey. *Risk Manag Healthc Policy*. 2021;14:585–94. <https://doi.org/10.2147/RMHP.S289782>.
45. Labrague L.J, de Los Santos J.A.A. Fear of Covid-19, psychological distress, work satisfaction and turnover intention among frontline nurses. *J Nurs Manag*. 2021;29(3):395–403. <https://doi.org/10.1111/jonm.13168>.
46. Jang, S.J. and S. Cho. Disaster nursing competencies of rural nurses during COVID-19: A cross-sectional study. *Collegian*, 2022: 1–15. <https://doi.org/10.1016/j.colegn.2022.09.007>.
47. ArshadiBostanabad M, et al. Clinical competency and psychological empowerment among ICU nurses caring for COVID-19 patients: a cross-sectional survey study. *J Nurs Manag*. 2022;30(7):2488–94. <https://doi.org/10.1111/jonm.13700>.
48. Saadati SM, et al. Comparison of pediatric nursing clinical competency from the viewpoints of nurses and headnurses in pediatric educational therapeutical center in guilan university of medical sciences, 2017–18. *J Sabzevar Univ Med Sci*. 2019;25(6):875–883 (Persian) http://jsuums.sinaweb.net/article_1150.html?lang=en.
49. Fotohi P, Olyai N, Salehi K. The dimensions of clinical competence of nurses working in critical care units and their relation with the underlying factors. *Quarterly J Nurs Manag*. 2019;8(2):1–9 (Persian) <http://ijnv.ir/article-1-575-en.html>.
50. Keshavarzi N, et al. Clinical competence and its relationship with job stress among neonatal intensive care unit nurses: a descriptive study. *Nurs Midwifery J*. 2021;19(7):527–38. <https://doi.org/10.52547/unmf.19.7.2>.
51. Bostanabad, M.A., et al., Clinical Competency and psychological empowerment among ICU nurses caring for COVID-19 Patients: a cross-sectional survey study. *J Nurs Manag*, 2022: 1–7. <https://doi.org/10.1111/jonm.13700>.
52. Manoochehri H, et al. Competence of novice nurses: role of clinical work during studying. *J Med Life*. 2015;8(Spec Iss 4):32–8.
53. Liou S-R, et al. The effects of a deliberate practice program on nursing students' perception of clinical competence. *Nurse Educ Today*. 2013;33(4):358–63. <https://doi.org/10.1016/j.nedt.2012.07.007>.
54. Istomina N, et al. Competence of nurses and factors associated with it. *Medicina*. 2011;47(4):33. <https://doi.org/10.3390/medicina47040033>.
55. Blomberg AC, Lindwall L, Bisholt B. Operating theatre nurses' self-reported clinical competence in perioperative nursing: a mixed method study. *Nurs Open*. 2019;6(4):1510–8. <https://doi.org/10.1002/nop2.352>.
56. Bahreini M, et al. Comparison of head nurses and practicing nurses in nurse competence assessment. *Iran J Nurs Midwifery Res*. 2011;16(3):227–34 <http://ijnmr.mui.ac.ir/index.php/ijnmr/article/view/471/311>.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Ready to submit your research? Choose BMC and benefit from:

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

At BMC, research is always in progress.

Learn more biomedcentral.com/submissions

