



Nurses' Competence and Job Related Factors among Nurses in University Hospitals: A Cross Sectional Descriptive Design

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DOI: 10.29252/anm-280305

Submitted: 30-12-2018

Accepted: 06-07-2019

Online-Published: 20-10-2019

Keywords:

Clinical Competence

Self-Assessment

Staff Development

Professional Competency, Nurse

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Cite this article as:

Mobasher Amini K, Rezaei B, Esmaeilpour Bandboni M. Nurses' Competence and Job Related Factors among Nurses in University Hospitals: A Cross Sectional Descriptive Design. Adv Nurs Midwifery. 2019;28(3):28-34.

Abstract

Introduction: Nurses' competence is a critical factor for providing safe and quality care and self-assessment is a key issue in maintenance of competence. This study was conducted to identify the level of competence and its associations with a number of job related factors.

Methods: A cross sectional study with descriptive design was conducted at seven university hospitals in Rasht during September 2015. This study included 230 nurses working in university hospitals who were selected using stratified sampling method. The majority of nurses was female and had a bachelor's degree. Nurses' competence was measured using a self-reported competency inventory for registered nurses (Persian version). Data was analyzed with Spearman correlation and Mann-Whitney-U test by SPSS-21 software.

Results: The average score of competence was in a high level with mean of 173.59 ± 26.72 (Range: 82-220). The highest and the lowest competence were in dimensions of 'ethical-legal performance' (3.23 ± 0.52) and 'Critical thinking/research aptitude' (3.11 ± 0.51), respectively. There were significant associations between nurses' competence and a number of job related factors, consisting work experience ($r = 0.30$; $P = 0.001$), monthly salary ($r = 0.23$; $P = 0.001$), working hours per month ($r = -0.18$; $P = 0.001$). In addition nurses who are working in the day shift reported higher competency, in comparison the rotating/night nurses ($P = 0.021$). The nurses who had permanent employment status reported higher competency, in comparison contract/temporary nurses ($P = 0.003$).

Conclusions: Nurses assessed their competence at a desirable level, which may be due to self-assessment tool. A number of job related factors was associated with nurses' competence. Considering that nurses have the lowest competency in the area of "critical thinking / research aptitude", it is suggested that nursing managers focus on planning of interventions in this area.

INTRODUCTION

In recent decades competence has been a major issue for all health-care providers [1] and its description and development has been a challenge [2]. Nurses' competence is a vital component for providing safety and quality care [3]. Competence is a complex issue which defining and evaluating is difficult [4]. Several methods have been used to define its concept and

describe the related factors [5]. Competence is defined as integrating values, attitudes, knowledge and skills in professional practice [3]. Competence is very important in meeting the patients' needs and nurses' roles [6]. The characteristics of competence include the integration of knowledge into practice, professional skills, care, communication, environment, motivation, experience,

critical thinking and professionalism, and the implications include self-confidence, safe practice and comprehensive care [7]. Various factors affect the attaining, preservation, and promotion of competence. The major factors are the psychological atmosphere of the ward, continuing education programs, available technologies, effective control, supervision, and management [8].

Benner (1984) believes that the best approach for competence assessment is self-assessment [9]. Since the competence is closely related to performance [10], its self-assessment is a beneficial managerial measure and helps nurses improve their performance by identifying strengths and weaknesses [11]. The importance of competence assessment as one of the key issues in maintenance of competence has been widely approved in the literature [3, 6, 12]. In order to planning for career development and continuous training, it is recommended that nurse managers assess competence and implement targeted interventions to ensure quality of care [10].

Presently, the first priority for nurse managers is improvement of the quality through enhancement of nurses' capabilities. Indeed, one challenge of health system is related to competence for optimal use. Therefore a systematic assessment of nurses' competence is a necessity [13]. The most studies have reported nurses' competence ranged from moderate to good level [14-16]. According to the past studies demographic, organizational and job related variables have been associated to the competence [3]. Among these variables, especially job factors are important. Nurses' shift work, especially night shift may affect nurses' physical and mental health and nurses' ability to provide quality of care [17]. Some studies have reported that clinical experience, educational level, employment, and training programs is related with competence [3, 10, 14, 18]. Determining these relationships can recognize strategies for in-service training and occupational development of nurses which may affect health care outcomes [1].

In the last decades despite progress in Iran's health system, nursing profession has been faced major challenges, such low social position and nurses' shortage [19]. Iranian nurses practice with a task-orientated approach, experience high job stress and have low job satisfaction [20]. Furthermore, in the recent years, nursing education in Iran has focused on theoretical education that could lead to the gap between knowledge and practice. While in the developed countries since 1994, competence-based education and evaluation has been a main priority [21]. In addition despite development in nurses' education level, Iranian people and the government have criticized the poor quality of health care provided by nurses [22]. Due to increasing in awareness and expectations of the Iranian society regarding the nursing care quality, the necessity of

competence importance has been felt more than ever [23].

For the first time in this study, nursing competency was measured using the Persian version of competency inventory for registered nurses (CIRN) in university hospitals. Understanding the factors affecting developing competence may help the nurse managers to train qualified nurses and promote quality of care. The competence assessment enables nurses to develop their career development pathways. The aim of this study was to evaluate the competence, and to determine the associations between competence and some job related factors.

METHODS

A descriptive and cross-sectional study was conducted in seven university hospitals in northern Iran during 2015. The population study included 1700 nurses working in general and special hospital wards. Data was gathered during December 2015. First, the list of nurses working in each hospital was made in collaboration with the hospitals' nursing manager. Then the nurses, who met the inclusion criteria, were identified. The sample size was calculated 251 nurses using the Cochran's sample size formula ($N = 1700$, $P=0.5$, $d=0.057$, $z = 1.96$). The participants were selected using stratified sampling method. First, each hospital was considered as stratum. Then, the number of samples in each stratum was considered in proportion to the stratum size. Final, in each stratum, samples were selected using simple random sampling.

The informed consent of the selected nurses was taken, and then the questionnaires were distributed. The study inclusion criteria's consisted of bachelor's degree or higher in nursing, willingness and informed consent to participate in the study, and one year or higher of clinical work experience. Incomplete questionnaires were excluded from the study. Ultimately a total of 230 registered nurses completed the questionnaire (response rate = 92%).

Data were collected using two questionnaires; demographic, and the competency inventory for registered nurses (CIRN). Demographic questionnaire had the questions including age, gender, marital status, education level, hospital ward, nurses' shift work, working hours per month, monthly salary and total work experience and clinical experience in the current unit.

The competency inventory for registered nurses was initially developed by Liu et al. (2007 and 2009) and was validated for registered nurses [24, 25]. Each dimension of this tool had at least six items and useful for teaching strategies, performance appraisals, recruitment, and assessment of learning needs [12]. This tool was produced as an objective tool for assessing competence in different clinical environments [25]. In present study the Persian version of CIRN which was validated by

Ghasemi, Janani, Dehghan -Nayeri, and Negarandeh (2014) was used after receiving the permission [26].

The CIRN has 55 items in 5-point Likert scale ranges from incompetent at all (score=0) to very competent (score=4). It has seven dimensions including clinical care, leadership, interpersonal relationships, legal/ethical practice, professional development, teaching-coaching, and critical thinking/research aptitude. The total score ranges 0 to 220 and high scores represent high competency. In order to ranking the competency, the total scores 0- 109, 110-165, and 166 to 220, represent low, moderate and high competence respectively [26]. In the initial version of CIRN, internal consistency Cronbach's α was 0.91 for the overall tool and 0.70-0.90 for the dimensions. The factor loading value across 55 items ranged from 0.31- 0.72 [25]. In Persian version, the content validity index was 0.94 for the tool and 0.83 to 0.95 for the dimensions. In addition Cronbach's α of the reliability was 0.97 for the scale and 0.68-0.87 for the dimensions through internal consistency method [26].

Descriptive statistics (mean, standard deviation, minimum, maximum) were used to distribution of continuous variables (age, total work experience, work experience in the current ward, working hours per month and monthly salary and competency), and frequencies and percentages were used to describe the categorical variables (competence level, gender, marital status, nurses' shift work, employment type, and education level). Any questionnaires with missing data were excluded from the analysis.

Due to the data had no normal distribution ($z=0.091$, $P=0.001$), and did not pass some assumptions that are required for liner regression analysis (i.e., normal distribution, zero conditional mean error, uncorrelated errors, normality residuals or errors), after we used nonparametric tests for data analysis. The correlation between clinical competence and continuous variables were tested using Spearman's correlation coefficient. Mann-Whitney U test was used to determine associations between competence score and the categorical variables. Data was analyzed using SPSS/21. Significance level was set at 0.05.

Therefore, the Ethical approval was obtained from the ethical committee (N: IR.GUMS.REC.1394.240). The participants were justified about the objectives of the study; all nurses were surveyed voluntarily and anonymously. The written informed consent was received from all nurses. Participants were also allowed to leave at any stage of the research. The questionnaires were anonymous and coded to classify hospitals and wards.

RESULTS

The age of participants ranged from 24 to 53 years, with an average 32.02 ± 7.11 years. The majority of nurses was female and had a bachelor's degree. More than half of nurses had permanent employment and working in general wards and

more than two-thirds of nurses worked on rotating shift work (Table 1). The mean score of competence was 173.59 ± 26.72 (Range: 82-210) and according in rating score of the scale considered in high level. Nearly two thirds of nurses (66.1%) reported their competence in high level and one-third (32%) reported it in a moderate level. The highest competence was in 'Legal/ethical practice' and 'leadership' while the lowest competence was in 'critical thinking/research aptitude' and 'professional development' dimensions respectively (Table 2). The married nurses reported higher mean score of competence (Mean 177.40 ± 24.75) than single nurses (Mean 166.17 ± 28.93) significantly ($P = 0.005$). Nurses working in day shift (Mean 180.79 ± 25.07) reported higher competence than nurses working at rotating shift (Mean 171.44 ± 26.88) significantly ($P = 0.021$). Furthermore, competence score of nurses with permanent employment (Mean 178.16 ± 24.86) were higher than nurses with contract/temporary employment (Mean 167.34 ± 28.02) significantly ($P = 0.003$). These results showed that the competence had significant relationships with nurses' shift work, employment type and marital status (Table 3, 4 and 5).

This study showed that competence positively correlated with total work experience ($P = 0.001$), work experience in current ward ($P = 0.001$), average monthly salary ($P = 0.001$), and age ($P = 0.001$). In addition there was a negative significant correlation ($P = 0.004$) between competence and average hours of working per month (Table 4). Nurses who worked more than 175 hours per month gained lower competence (Mean 164.68 ± 28.47) compared to nurses who worked lower 175 hours per month (Table 3 and 4).

Table 1: Personal and job related factors of registered nurses (n=230)

Variables	Mean $\pm$ SD* (Min- Max) N (%)
Age (Years)	33.0 $\pm$ 7.0 (24-53)
Work experience (years)	9.0 $\pm$ 6.1 (1-28)
Work experience in the present unit (years)	5.0 $\pm$ 4.1 (1-20)
Hours of working per month	170.56 $\pm$ 11.85 (140-200)
Gender	
Female	211 (91.7)
Male	19 (8.3)
Marital status	
Married	152 (66.1)
Single	78 (33.9)
Education level	
Bachelor's degree	219 (95.2)
Master's degree	11 (4.8)
Ward type	
General Ward**	126 (54.8)
Special Ward ***	104 (45.2)
Shift type	
Day shift	177 (76.0)
night /rotating shift	53 (23.0)
Employment	
Permanent	116 (50.6)
Contract	57 (24.7)
Temporary	57 (24.7)
Total	230 (100)

* SD: Standard Deviation

** General Wards including: Medical, Surgical, Pediatrics, Orthopedics, OB and GYN wards

**** Special Wards including: CCU, ICU, NICU, Hemodialysis, Emergency

Table2: Competency Level and Dimensions of it in Employed Nurses

Competence dimensions and level	Number of items	Min	Max	Mean Likert scale (0-4)	SD	Dimensions' ranking	N(%)
Clinical care	10	13	40	3.16	0.57	3	
Leadership	9	15	36	3.18	0.54	2	
Interpersonal relationships	8	9	32	3.14	0.51	4	
Legal/ethical practice	8	13	32	3.23	0.52	1	
Professional development	6	9	24	3.12	0.49	6	
Teaching-coaching	6	8	24	3.13	0.60	5	
Critical thinking/research aptitude	8	14	32	3.11	0.52	7	
Total competence scale	55	82	220	3.17	0.49	-	
Competence Level (score range)							
High (165-220)							152 (66.1%)
Moderate (110-165)							75 (32.6%)
Low (< 110)							3 (1.3%)

Table3: Scores of Nurses' Competence According to the Personal and Job Related Factors

Variables	Competence score Mean $\pm$ SD*
Work experience	
Lower than 5 years	163.24 $\pm$ 26.07
5- 10 years	175.55 $\pm$ 27.37
10- 20 years	182.20 $\pm$ 22.48
Higher than 20 years	182.87 $\pm$ 27.15
Working hours per month	
Lower than 155	170.43 $\pm$ 29.8
155-175	180.93 $\pm$ 22.63
175-200	164.68 $\pm$ 28.47
Gender	
Female	174.41 $\pm$ 26.66
Male	164.53 $\pm$ 23.65
Marital status	
Married	177.40 $\pm$ 24.75
Single	166.17 $\pm$ 28.93
Education level	
Bachelor degree	168.63 $\pm$ 31.74
Master degree	173.84 $\pm$ 26.50
Hospital ward	
General **	171.26 $\pm$ 27.67
Special (Intensive) ***	175.52 $\pm$ 25.86
Nurses' shift work	
Day (Morning) shift	180.79 $\pm$ 25.07
Rotating shift	171.44 $\pm$ 26.88
Employment	
Permanent	178.16 $\pm$ 24.86
Contract/ Temporary	167.34 $\pm$ 28.02
Total	173.59 $\pm$ 26.72

Table4: The Relationship between Personal Carestrictics and the NC

Variable	Statistical Test	Statistic	P- value
Age	Spearman's correlation	r = 0.314	P = 0.001*
Total work experience	Spearman's correlation	r = 0.304	P = 0.001*
Work experience in current ward	Spearman's correlation	r = 0.231	P = 0.001*
Working hours per month	Spearman's correlation	r = -0.189	P = 0.004*
Monthly salary	Spearman's correlation	r = 0.236	P = 0.001*
Marital status	Mann-Whitney U	4598.50	P = 0.005*
Gender	Mann-Whitney U	1510.00	P = 0.075
Nurses' shift work	Mann-Whitney U	3709.00	P = 0.021*
Hospital ward	Mann-Whitney U	6017.00	P = 0.287
Employment type	Mann-Whitney U	4957.50	P = 0.003*

* P < 0.05

DISCUSSION

In present study, the competence in university hospitals was investigated through self-assessment method and its relationships with some job related factors were assessed. The findings showed that two third of nurses reported their competence in high level. Similarly, more international [1, 13-16] and national studies [8, 27, 28]

have reported competence in good or excellent level using self- assessment tool. For example, Heydari et al. (2016) showed that majority of nurses rated themselves as "good" and "very good" [27]. Also, Cruz et al. (2017) measured a very good competence in all the categories for clinical competence of nurses with the highest scores

in “managing situations” [14]. Inconsistent with the present study, in the study by Mirlashari et al (2016), nursing competence is reported in moderate level [21]. In Iran, unlike developed countries, although nurses' education level have increased in last decades and nurses' competence have reported in high level in past researches, but people and the government have criticized the poor quality of care provided by nurses [22]. This issue may be related to the nursing education and health services system or due to lack of motivation and job satisfaction, job burnout, low duration and quality of retraining course, poor social position and nursing shortage [19, 20].

The nurses' practice environments are often very complex and require highly competence and qualified nurses [15]. “Nurses, like all professionals, gain public trust through competence, credibility and accountability” [29]. Although the level of competence directly affects the quality of care [30] but it is not the only factor which determines the quality of patient care. It seems that despite the high level of Iranian nurses competency reported in pervious researches, yet the quality of nursing care is not well. Self-reported method has been considered essential to competence assessment and maintenance, and confidence in the work environments [6] but other approaches, such as observation may be more useful than self-assessment in evaluating the competence [12].

Knowing the level of competence and its related factors can help nurse managers to improve the professional competence of nurses through assigning proper duties and implementing in-service training programs [27]. Although some studies have shown that there has been no significant difference between nurses' self-assessment and supervisors' assessment but it seems more researches is needed in Iranian context. Competence has multiple dimensions, so its assessing requires multi-approach tool.

In present study nurses reported their highest competence in 'legal/ethical practice' and 'leadership' dimensions. Different tools have been used to assess the competence in previous studies, and a few studies have used the CIRN tool. Similarly, in more studies the highest competence has been reported in this dimension [10, 14, 27]. For example, Meretoja et al. (2015) reported that all nurses were most competent in patient-related nursing tasks, in maintenance of professional competence and in ethical care [10]. Also Heydari et al. (2016) and Cruz et al. (2017) showed the highest scores of nurses' competence was in “managing situations” [14, 27]. However in the study by Komeili-Sani et al (2015) the highest competence was reported in 'teaching-coaching' dimension [28]. The difference in findings may be due to different tool and nurses' different views and expectations regarding their roles and skills.

Ethical competence is a major part of competence that is formed based on an individual development process

in society and the structures of personal, educational, and functional values [31]. The importance of ethics is related to which idea that believes nursing profession was founded on ethics [31, 32]. Moreover, due to the presence of violence, anxiety, job dissatisfaction, distress, and ethical contradictions in the nursing practice, nurses needs high ethical competency [31]. The high ethical competence can help nurses in providing health care with ethical aspects in a stressful hospital environment.

In this study, the lowest competence was reported in “critical thinking/research” and “professional development”. Similarly Meretoja et al. (2015) have reported the lowest nursing competence in these dimensions [10]. In contrast, several studies reported the lowest competence in 'ensuring quality' dimension [14, 27, 28].

Differences in these findings may be due to the different tools and different conditions and skills of the nurses studied. In present study, competence had a significant correlation with job related factors (i.e. total work experience, work experience in current ward, monthly salary) and a number of personal factors (i.e. age). In addition nurses who are working in the day shift reported higher competency, in comparison the rotating/night nurses, and nurses who had permanent employment status reported higher competency, in comparison contract/temporary nurses. In addition competence had a significant negative correlation with working hours per month. Although these correlations were not strong, it was statistically significant. The more studies using self-assessment tool have shown competence were significantly associated with work experience [2, 3, 14], age [3, 10], education level [3, 14, 33], permanent employment [3], work experience in current ward [8] and marital status [14]. However in other studies age, gender, marital status, education level [27], total work experience and work experience in current ward [8] were not associated with competence. In past studies there was expected theoretically, systematic correlation between the work experience and competence based on Benner's framework [3, 9, 30]. Higher work experience will result in greater proficiency, and so, competency and mastery [28]. Nursing manager's skills to make and keep positive working environments can promote novice nurses' professional growth [16]. Changes in nurses' working conditions may improve nurses' health-related lifestyles and may improve professional development [34]. According to the results, nurses with more working hours per month reported lower competence. It seems that due to the nursing shortage in Iran, despite the fact that young and novice nurses have not sufficient competence, they have to work a lot of working hours per month. While nurses with a high level of work experience and competence, they are usually at the managerial position such as head nurse and supervisor,

and working lower hours per month. This reality can threaten the quality and safety of nursing care for patients.

Nursing practice is inherently stressful and challenging [14]. Nurses' competence is acquired through interaction with other professionals, in daily nursing activities and through formal education [2] and it directly influence the quality of nursing care [30]. Novice nurses need to support and professional opportunities for competence development [15]. Knowledge of relationships between competence and job related factors can identify strategies for the training, maintenance and promotion of nurses' professional development and potentially impact on patient care outcomes [1]. But most hospital managers are not concerned about creating an effective policy for nurses' development [2].

Since competence was assessed using a self-reported tool, competence level may be more than realistic and this is a limitation. For the more accurate assessment of competence, assessment by colleagues, head nurses and the supervisors is suggested.

CONCLUSIONS

This study provided data that could lead to improvements in nursing competence and practice. Based on this study, the improvement of clinical competence of nurses in the fields of 'critical thinking/research' is necessary. Regarding the relationships between some job factors (e.g., monthly working hours, monthly salary, nurses' shift work, and employment type) with competence, it seems modification or improvement of these factors may be effective in enhancing nurses' competence. Based on present study, Iranian nurses especially novice nurses, due to nursing shortage, are forced to have high working hours with high workload and low monthly salary. This issue can lead them to chronic fatigue, dissatisfaction, burnout, and health problems and affected their competence and ultimately lead to weak quality of nursing care. The findings of present study could be helpful in planning managerial interventions for clinical competence development. Further research is recommended.

Ethical Consideration

This study was approved by the ethical committee of Isfahan University of Medical Sciences (N: IR.GUMS.REC.1394.240).

Acknowledgments

This article has been extracted from a master's thesis of nursing. Much appreciation goes to the Research Deputy of research of Islamic Azad University, Isfahan Branch who undertook the funding of this study (N: 23810403932043) and the nurses who participated in the study.

Conflict of Interest

The authors declare no conflict of interest in this study.

Funding

This study was funded by the Islamic Azad University, Isfahan (Khorasgan) Branch.

Authors' Contributions

Study design: Khadijeh Mobasher Amini, Behrooz Rezaei, Mohammad Esmailpour Bandboni. Data collection: Khadijeh Mobasher Amini, Behrooz Rezaei, Mohammad Esmailpour Bandboni. Statistical analysis of data: Khadijeh Mobasher Amini, Behrooz Rezaei. Revision of the manuscript: Khadijeh Mobasher Amini, Behrooz Rezaei, Mohammad Esmailpour Bandboni.

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