Relationship between the personal characteristics of the critical care nurses and their competence

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Abstract

Background: Patient safety is impacted by the personality traits of critical care nurses and is correlated with their competence, ability to handle stress, and to manage with burnout. **This study aimed to** investigate the relationship between the personal characteristics of the critical care nurses and their competence. **Research design:** A descriptive cross-sectional research design was utilized. **Setting:** This study was conducted in intensive care unit at Al Mobara Hospital and Assiut University Main hospital from August 2022 until the end of February 2023. **Sample:** A convenience sampling of 186 critical care nurses who provide patient care were asked to participate in the study. 120 nurses responded to the online survey, which was distributed to them. **Tools:** Two tools were utilized in this study; personality characteristic of critical care nurses assessment and nursing competence assessment**. Method:** The researcher transmitted the online link of the questionnaire to participants in Telegram App group or via their professional email addresses for completing the questioner**. Results:** 69.2% of the studied nurses had an expert level of nursing competency**.** There is a significant positive correlation between extraversion as a personality characteristic of studied nurses and four nursing competencies (P value < 0.05). **Conclusion:** This study helped to clarify critical care nurses level of competence; most of them have an expert level of nursing competency, and this study validated the importance of personality characteristics in the development of critical nursing competence. **Recommendation:** More studies are essential to assess the variables influencing critical care nurses' competency.

Keywords: Competence, Critical care nurses & Personal characteristics

Introduction

Competence is the capacity to display the technical, critical thinking, interpersonal skills essential for job performance. Concerns about safety and the standard of nursing care have been extensively addressed in relation to nurse competency. Nursing competence is defined by the World Health Organization (WHO) as a framework of skills that represents knowledge, attitudes, and psychosocial and psychomotor components. The ability of a nurse to exhibit a range of qualities, including personal traits, knowledge, attitudes, values, and skills necessary to carry out nursing professional responsibilities, is a more comprehensive definition **(Bama et al., 2020)**

Both specialized and general nursing skills are necessary for critical care nurses working in the intensive care units. The capacity to promptly and effectively use decision-making (DM) in the face of a critical illness is the most crucial competency. The capacity to deliver high-quality, secure care at all times is also crucial **(Murshid, et al., 2021).**

Clinical competence and professional competence are two dimensions of critical care nursing competence. The three areas of clinical competence are nurse intervention (NI), clinical guidelines, and principles of nursing care (PNC). The four areas of professional competence are ethical activity, decision-making (DM), development work, and collaboration. However, there is still confusion on the definition, elements, assessments, and patient prognosis of critical care nursing competency. Patients and nurses are both affected by a nurse's competency **(Bahreini et al., 2011; Fayek, & Omar, 2016).**

Safety, health status, morbidity, and mortality of patients are directly impacted by the critical and emergency nurses' degree of competence. Lack of competency in nurses can have a number of unfavorable effects, such as frustration, work unhappiness, and attrition. As a result, continuously assessing of critical care nurses' competence is necessary for management and education in nursing profession. This will give nurse educators and managers a greater understanding of the field and enable them to improve the standard of nursing care **(Okumura et al., 2019)**.

Superior competence involves a number of aspects that cannot be fully resolved by the development of information and skills alone. Recent reports suggest that personal characteristics like emotional intelligence (EI) and personality factors may be linked to general nursing competency (**Heydari et al., 2016; Bock, 2020; Cuartero & Tur, 2021**).

Additionally, emotional intelligence and personality characteristics have been linked to nurses' job satisfaction and burnout (**Geuens et al., 2017**).

The most popular taxonomy for evaluating personality traits is known as the "big five personality model," which consists of five personality inventories: extraversion, agreeableness, conscientiousness, neuroticism, and openness to new experiences. This model has received widespread validation and is commonly utilized in medical research. This model is a helpful tool for examining how personality and ability are related (**Power & Pluess, 2015**).

Significance of the study

Emerging technology and medicines are continually being developed in the intensive care unit to help patients recover from their frequently life-threatening illnesses. To overcome the obstacles, critical care nurses must acquire and preserve competence in critical practice. As a means of enhancing nursing competency, focusing has traditionally been on gaining of medical and nursing information, the development of skills, and the improvement of logical thinking. In other words, enhancing nursing competence will enhance nursing care quality, which will enhance patient safety and nursing staff mental health (**Lakanmaa et al 2014 & Bock, 2020**). On this study, the researcher would explain the relationship between nurses' competence and their personality characteristics.

Aim of the study
This study aimed to explore the relationship between personal characteristics and critical care nurses competence.

Research questions
▪ What are the levels of nurses' competencies at critical care units?
▪ What are the relationship between critical nurses' competencies and their personal characteristics?

Subjects and Methods

Research design:
A descriptive exploratory research design was be utilized to conduct this study.

Setting:
This study was conducted in intensive care units (ICU) and emergency units at Al Mobara Hospital and Assiut University Main hospital. Intensive care units and emergency units at Al Mobara Hospital included general ICU (12 beds in 2 separate rooms, 2 head nurses, 20 nurses, and the nurse-patient ratio is 1:2), medical ICU (9 beds in 3 separate rooms, 2 head nurses, 15 nurses, and the nurse-patient ratio is 1:2), and medical emergency unit (17 beds in 6 separate rooms, 4 head nurses, 15 nurses, and the nurse-patient

ratio is 1:3). Intensive care units and emergency units at Assiut University Main Hospital included general ICU (16 beds in 4 separate rooms, 6 head nurses, 25 nurses, and the nurse-patient ratio is 1:3), trauma ICU (16 beds in 3 separate rooms, 5 head nurses, 20 nurses, and the nurse-patient ratio is 2:3), anesthesia intensive care unit (12 beds in 3 separate rooms, 7 head nurses, 20 nurses, and the nurse-patient ratio is 1:2), and medical emergency unit (60 beds in 4 separate rooms, 10 head nurses, 35 nurses, and the nurse-patient ratio is 2:3).

Subjects:
A convenience sampling of 186 critical care nurses responsible for caring for critically ill patients in ICUs and emergency units at Al Mobara Hospital and Assiut University Main Hospital was requested to take part in the study. The questionnaire was sent online, and 120 of the nurses responded it.

Tools of data collection:
Two tools were used by the researcher in this study after reviewing of the relevant literatures (**Okumura et al., 2019** & **Oshio et al., 2012**) to evaluate the association between personal characteristic and critical care nurses competence.

Tool (1): Personality characteristic of critical care nurses assessment tool:
This tool was adapted by the researcher after reviewing of the relevant literatures (**Oshio et al., 2012**) to assess the personal characteristic of critical care nurses. This tool consisted of two main parts:

Part (1): Demographic data
It was involved gender, age, education, number of years working as a nurse or in a critical care units and marital status.

Part (2): Personality traits assessment sheet
A Japanese version of the Ten-Item Personality Inventory (TIPI-J) adopted from (**Oshio et al., 2012**) to evaluate personality traits. There are two items for each dimension in the 10 items that make up the TIPI-J. For each dimension, one item is positively keyed and the other is negatively keyed. Items are rated on a 7-point Likert-scale ranging from 1 ''strongly disagree'' 7 to ''strongly agree''. The following Big Five personality traits was assessed: Extraversion (sociable and outgoing), Agreeableness (altruism and empathy), Conscientiousness (impulse control, planning and organizing), Neuroticism (psychological maladjustment and more experiences of unpleasant emotions), and Openness to Experience (imagination, curiosity, and intellectualism).

TIPI scale scoring ("R" denotes reverse-scored items):
Extraversion: 1, 6R; Agreeableness: 2R, 7; Conscientiousness; 3, 8R; Emotional Stability: 4R, 9; Openness to Experiences: 5, 10R.

Tool (2): Nursing competence assessment tool
Self-report The Critical Care Nursing Competence Questionnaire for Patient Safety (C3Q) adopted from **(Okumura et al., 2019)** to evaluate critical care nurses competence. The C3Q-safety has 22 items and each item was score utilizing a five-point Likert scale, with higher scores corresponding to better achievement. The 22 items were divided into four nursing competencies: decision-making (DM; seven items), collaboration (five items), nursing intervention (NI; five items), and principles of nursing care (PNC; five items).

Scoring system of level of competence:
The max score of nursing competence was 110 and divided to five level of competency as the following:
- Less 60% is novice level of nursing competency.
- 60- < 75% is the advanced beginner level of nursing competency.
- 75- < 80% is the competent level of nursing competency.
- 80- < 90% is a proficient level of nursing competency.
- 90% and more is the expert level of nursing competency.

Method:
This study was conducted on two phases:

Phase one: Preparatory phase:
- The researchers were started the study after evaluating relevant literature, including textbooks and journals.
- **Ethical** consideration**:**
  ⤷ Research proposal was approved from Ethical Committee in the Faculty of Nursing.
  ⤷ There is no risk for study subject during application of the research.
  ⤷ The study was following common ethical principles in clinical research.
  ⤷ An Official Permission to apply the study was obtained from the Assiut university hospital and El Mobara hospital responsible authorities after discussing the objective of the study.
  ⤷ Written consent was gained from critical care nurses that are willing to participate in the study. The studied nurses were asked to tick the box next to "Yes, I agree and this is my informed consent" on the online form in order to provide written informed consent for their involvement in the study.
  ⤷ Nurses will be assured that the data of this research will be utilized only for the aim of research.
  ⤷ Confidentiality and anonymity will be assured.
  ⤷ Nurses have the right to refuse to participate and or withdraw from the study without any rational any time.

- The researcher translated the questionnaire into Arabic and then into English for assessing validity and reliability.
- **Tool validity: A** panel of five specialists in critical care and emergency nursing at Assiut University evaluated the tools for relevance, clarity, and applicability. Based on their opinions, the researcher made some changes.
- **The reliability of the tools** were assessed by Cronbach`s Alpha to evaluate the consistency and stability of the tools (0.922, 0.923, respectively).
- **Pilot study:** A pilot study was conducted on 10% of nurses worked in previous mentioned setting to test the clarity, applicability of the questionnaire and to determine the time required to complete sheet and the essential modification was be done and the final form was created and these was be excluded from the sample of the study.

Phase (II): Data collection:
- The researcher created group in Telegram App and added all nurses worked in previously mentioned settings.
- All participants were informed of the study's purpose, and allowed time to answer any questions.
- The researcher created a Google account by going to www.docs.google.com. Once an account was created the researcher inserted the questions in the Google Form.
- The researcher send the link of the online questionnaire to participants in Telegram App group or via their professional email addresses for filling the questioner and explain how fill the form.
- The time need for filling this questioner was about 10 minutes.
- The whole duration for data collection took about 6 months from August 2022 until the end of February 2023.

Statistical analysis:
Using PC software, the researcher entered the data she had gathered. The Statistical Package for Social Sciences (SPSS) Version 22 was used for the statistical analysis. For qualitative variables, frequency and percentage descriptive statistics were used to present the data. The characteristics of the studied nurses were determined using the chi-square test. ANOVA was used to evaluate quantitative continuous data between more than two groups and independent samples. Independent samples t-test used to compare between two groups. The chi-square test was used to compare qualitative variables. The association between a personal trait and a critical care nurse's competency was examined using Pearson's correlation (r). The statistical significance was determined at a level of 0.05.

Results

Table (1): Demographic data of participants critical care nurses (N=120)

Demographic Characteristics	No	%
Gender		
Male	22	18.3
Female	**98**	**81.7**
Age		
From 20 < 30 years	**74**	**61.7**
From 30 < 40 years	29	24.2
From 40 < 50 years	17	14.2
Marital status		
Single	34	28.3
Married	**71**	**59.2**
Divorced	11	9.2
Widow	4	3.3
Residence		
Village	54	45.0
City	**66**	**55.0**
Education Level		
Nursing Diploma	16	13.3
Nursing Institute	44	36.7
Nursing Bachelor	**54**	**45.0**
Master	5	4.2
Specialized Diploma in Nursing	1	0.8
Number of years working as a nurse		
less than 5 years	31	25.8
From 5 < 10 years	**44**	**36.7**
from 10 < 15 years	13	10.8
15 years or more	**32**	**26.7**
Number of years working in a critical care units		
less than 5 years	**54**	**45.0**
From 5 < 10 years	**39**	**32.5**
from 10 < 15 years	21	17.5
15 years or more	6	5.0

Table (2): Mean Score of ICU nurse personality characteristics   according to (A Japanese version of the Ten-Item Personality Inventory (n=120)

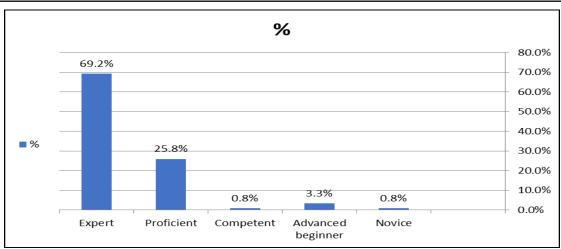| Personality characteristics	Max Score	Mean±SD	Range	Mean%
Extraversion	14	11.98±2.24	2-14	85.6
Agreeableness	14	8.98±1.87	5-14	64.2
Conscientiousness	14	8.04±1.45	3-14	57.4
Neuroticism	14	8.93±2.03	3-13	63.8
Openness to Experience	14	8.14±1.82	2-14	58.2

Figure (1): Percentage distribution of participant nurses according to their nursing competency level (n=120):

Table (3): Mean Score of critical care nurses competence Subdomains (n=120)

Nursing competence Subdomain	Max Score	Mean±SD	Range	Mean%
1. Decision making	35	32.52±4.24	7-35	92.90
2. Collaboration	25	22.48±3.43	5-25	89.93
3. Nursing intervention	25	23.31±2.61	5-25	93.23
4. Principles of nursing care	25	23.45±2.58	6-25	93.80
General Nurses competence	110	101.76±10.77	23-110	92.51

Table (4): Correlation Co-efficient between personality characteristics of studied nurses and nursing competence (n=120)

Items	Decision making	Collaboration	Nursing intervention	Principles of nursing care
Extraversion	**.593****	**.416****	**.609****	**.648****
Agreeableness	-0.090	**-.261-****	-0.053	-0.014
Conscientiousness	**-.186-***	-0.109	-0.050	-0.003
Neuroticism	-0.151	-0.152	-0.105	0.064
Openness to Experience	-0.060	0.054	0.140	0.139

Pearson's correlation   *Statistically Significant Correlation at P. value <0.05*
Statistically Significant Correlation at P. value <0.01

Table (5): Relation between personality characteristics   of the critical nurses and their demographic data (n=120)

Items	N	Personal characteristic Mean ± SD	P. value
Gender			
Male	22	56.27±13.42	0.104
Female	98	59.99±8.59	
Marital status			
Single	34	56.03±10.46	
Married	71	59.65±9.42	**0.022***
Divorced	11	65±6.71	
Widow	4	65.5±3	
Residence			
Village	54	56.67±10.73	**0.006***
City	66	61.47±8.22	

Items	N	Personal characteristic Mean ± SD	P. value
Age			
From 20 < 30 years	74	56.16±9.77	
From 30 < 40 years	29	65.59±4.99	**0.000***
From 40 < 50 years	17	62.29±9.64	
Academic qualification			
Nursing Diploma	16	59.38±8.33	
Nursing Institute	44	57.61±9.44	
Nursing Bachelor	54	60.04±10.25	0.094
Master	5	68.6±1.52	
Specialized Diploma in Nursing	1	47±0	
Number of years working as a nurse			
less than 5 years	31	54.52±7.42	
From 5 < 10 years	44	59.64±9.83	
from 10 < 15 years	13	58.54±13.11	**0.002***
15 years or more	32	63.81±7.9	
Number of years working in a critical care units			
less than 5 years	54	55.17±8.36	
From 5 < 10 years	39	61.92±9.86	
from 10 < 15 years	21	66.19±5.22	**0.000***
15 years or more	6	55.5±13.88	

Independent t-test quantitative data relation between the two groups-
- One-way ANOVA quantitative datarelation between the three groups or more
* Statistically significant differences at P. value <0.05

Table (6): Effect of demographic data on Nursing competence according to Univariate and Multivariate Linear regression model (n=120)

Demographic data	Univariate		Multivariate	
	Beta	**Sig.**	**Beta**	**Sig.**
Gender	0.180	**0.049**	0.165	0.070
Age	0.291	**0.001***	0.158	0.341
Marital status	0.151	0.100	-0.054	0.596
Residence	0.194	**0.034***	0.099	0.289
Education Level	0.046	0.619	0.115	0.200
Number of years working as a nurse	0.297	**0.001***	0.230	0.219
Number of years working in a critical care units	0.216	**0.018***	-0.058	0.694

* statistically Significant Factor at P. value <0.05   *** statistically Significant Factor at P. value <0.01*

Table (1): Regarding the characteristics of the nurses studied, the researcher sends the questionnaire to approximately 186 critical care nurses, and 120 patients respond. More than two-thirds of the nurses surveyed are female (81.7%), and more than half (61.7%) are aged between 20 and 30 years. (59.2%) of the participants are married and the highest percentage of them (45%) have a bachelor's degree in nursing. Regarding nursing experience, about (36.7%) of the participants have experience ranging from 5 to less than 10 years in nursing, while (26.7%) of them have about 15 years of experience in nursing. A total of 54 participants (45%) have been working as a critical care nurse for less than 5 years, compared to (32.5%) working as critical care nurses for 5:10 years.

Table (2): It is shown that the majority of the participants nurses are extraverted (85.6%), and (64.2%) of them are agreeableness.

Fig (1): This figure demonstrates that (69.2%) of the studied nurses have an expert level of nursing competency, while (25.8%) of them have a proficient level of nursing competency.

Table No. (3): It shows that the mean and standard deviation for the decision-making efficiency of the participating nurses is (32.52±4.24), while it is (22.48±3.43) for the cooperation efficiency. Regarding the efficiency of nursing intervention, the mean and standard deviation are (23.31±2.61) compared to (23.45±2.58) for the principles of nursing care efficiency. The mean and standard

deviation for general nurses' competence is (101.76±10.77).

Table (4): Shows that there is a significant positive correlation between extraversion as a personality characteristic of the studied nurses and four nursing competencies.

Table (5): This table clarifies that there is statistical significant correlation between studied nurses' personality characteristics and all demographic items except gender and academic qualification.

Table (6): It shows that gender, age, residence, number of years working as a nurse, and number of years working in critical care units are significantly associated with nurses' competencies (P value = 0.049, 0.001, 0.034, 0.001 and 0.018, respectively).

Discussion

The current study was conducted to evaluate the relationship between personal characteristics and competence of the critical care nurses at Al Mobara Hospital (general intensive care unit, medical intensive care unit, and medical emergency unit) and Assiut University Main Hospital (general intensive care unit, trauma intensive care unit, anesthesia intensive care unit, medical emergency unit). This section provides a short review of related results, and recommendations for future research.

Knowledge, performance, psychomotor and clinical problem-solving skills, together with a flexible attitude, are all components of competence. Nurses in critical care units play a key role in providing critical ill patients and their families with evidence-based, patient-centered care. As a result, they must be skilled in treating certain patient groups to uphold the standard of care **(Tongprateep, 2015).**

The present study explained that more than half of critical care nurses' ages ranged from 20 to 30 years because most of the nurses who work in intensive care units were new graduates from the Faculty of Nursing. These findings were supported by **Osman et al., (2019)** who found in their study "the relationship between Nurses' competencies and the quality of patient care at critical care units" that the majority of studied nurses had ages ranging from 20 to less than 30 years.

The present study presented that more than two-thirds of the participant's nurses were female. This is explained by the fact that female are more likely than men to work in the nursing field, and personal traits may influence competency. **Masatoshi et al., (2021),** study on "personality traits affect critical care nursing competence" confirmed these conclusions by revealing that the majority of the study sample consisted of females.

Regarding educational level, more than one-third of the study sample has a bachelor's degree in nursing

and has worked in critical care units less than 5 years. In the researcher's opinion, the hospital policy preferred to appoint nurses with bachelor's degrees in intensive care units due to the critical cases of patients who deal with them. As opposed to this, **Osman et al., (2019)**, who found that about three quarters of the study sample had associated degree in nursing.

Personality traits can shed light on potential behaviour patterns in individuals, which is useful for the organization. As a standalone characteristic scale for assessing personality traits, the Ten-Item Personality Inventory (TIPI-J) in Japanese was found to be extremely accurate **(Bainbridge & Smillie, 2022).**

According to the ten-item personality scale used in the current study, extraversion was shown to be a dominating personality attribute. In the researcher's opinion, a critical care nurse with a bachelor's degree, has a multi-tracked mind, a passion for routine, patient familiarity, closeness, and giving one patient at a time all of your focus. This was in contrast with **Bataweel (2023),** who reported that conscientiousness was the most prevalent personality attribute.

According to the current study's findings about nursing competency, more than half of the studied nurses had an expert level of nursing competency, while one quarter of them had a proficient level of nursing competency. This might be connected to the fact that critical care nurses must be competent to provide nursing care that meets the demands of patients with life-threatening diseases utilizing logical reasoning and precise nursing skills. The present study results were congruent with the study of **Shouryabi et al., (2017)**, as it showed that the majority nurses had high levels of clinical and professional competence in intensive care units.

On the same line, **Heydari et al., (2016)** documented that the most of nurses gave their overall nursing competence a good or very good rating. The findings of additional studies carried out in Iran and other countries of **Istomina et al. (2011); Bahreini et al., (2013); & Kajander-Unkuri et., al. (2014)**, which revealed that the nurses competence level was good. In addition, **Bahreini et al., (2011)** documented that majority of nurses rated their competence as good.

Results of the current study revealed that personality characteristics were positively correlated with nursing competence. This can be attributed to the characteristics of critical care nursing competency depend on personal characteristics traits, cognitive ability, orientation to ethical or legal practice, involvement in professional development, cooperation with other healthcare professionals, and teaching to patients and their families. This result was

in agreement with the findings of **Heydari et al. (2016),** who documented that the personality of the nurses is substantially connected with their degree of competence. On the other hand, **Masatoshi et al. (2021)** mentioned that each personality trait had a limited correlation with nursing competence.

In the present study, it was found that all demographic factors, with the exception of gender and academic degree, were statistically connected with the personality traits of the nurses. This is because age, marital status, and years of nursing experience all have an impact on person characteristics. This result was in accordance with a study conducted by **Ang et al. (2016)** who reported that demographic factors such age, gender, marital status, job title, shift work, and experience have also been found to have an impact on a person's level of depersonalization.

The current study summarized that there was a statistically significant correlation between the critical nurses' competence and demographic data such as age, gender, and previous nursing experiences. In the researcher's opinion, age, gender, and previous nursing experiences are essential factors in a nurse's personality that are correlated with a nurse's competency level. This result was similar to the result revealed by **Flinkman et al. (2016)** who reported a statistically significant relationship between demographic information, level of competence, and years of work experience. Also, these results were in line with, **Meretoja et al. (2015)** found a significant positive correlation between the degree of competence and demographic data, such as the work experience in the health care setting and length of experience in the recent work unit.

Conclusion:

Overall, this study helped to clarify the critical care nurses level of competence; most of them have an expert level of nursing competency, and this study validated the importance of personality characteristics in the development of critical nursing competence. Furthermore, this study concluded that nurses' personality characteristics were positively correlated with demographic data, which consequently affect critical care nurses competency.

Recommendations:

More studies are essential to assess the variables influencing critical care nurses' competency. Furthermore, more research is required to study the different personality characteristics of critical care nurses, which will improve overall nursing care in intensive care units.

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