



## **Clinical competencies of ICU nurses and the association of factors influencing the level of competencies in selected hospitals of Kamrup (Metro) Assam**

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### **Abstract**

**Background:** 'Competency' is an important word in health care settings. From a novice nurse to a proficient registered nurse whoever is assessing a newly admitted patient or feeding a patient in a unit or a student nurse in a nursing education program continuous clinical competence is essential for everyone. The definition of clinical competence clearly refers to individual competence. It is thought to involve many aspects of the nurses' professional attributes, including the individual's personality trait, level of education, experience in practice and health care management skill. ICU nurses are expected to have superior professional knowledge and skills, be familiar with modern technical equipment and dedicated to the patient. Requirements for working in ICUs differ from one country to another. Nurses previously registered just once, after graduation, but are now required to demonstrate continuing competence if they are to maintain their registration. At the same time, communities expect safe and competent health care as a right. To fulfil their expectation, nurses need to be professionally and clinically competent.

**Materials and Methods:** The present research study was conducted on 218 registered nurses selected by simple random sampling. The purpose of the study was explained to the nurses and written consent was taken from them and also assurance was given to maintain the confidentiality. The baseline data was collected from the samples using the structured interview schedule. Level of nurses clinical competencies was assessed by using the observational checklist and the factors influencing the clinical competencies of the ICU nurses was assessed by the Nurses competence scale (Rating Scale).

**Results:** As per the score of observation checklist and three longitudinal observations to assess the level of clinical competencies of ICU nurses, the maximum score of clinical competencies of ICU nurses are within the range of very good (38-48) with majority of nurses (84.86% in 1<sup>st</sup> observation, 74.31% in second observation and 68.34% in third observation respectively %) with an average mean  $\pm$  SD of  $44.87 \pm 3.04$ ,  $44.36 \pm 2.86$  &  $45.16 \pm 2.876$  respectively. There is no significant difference among the average of three observations made while assessing the level of clinical competencies of ICU nurses.

The factors especially teaching-coaching ( $37.66 \pm 10.06$ ; Range: 10-68), diagnostic functions ( $16.6 \pm 4.56$ ; Range 3-37) and work role ( $45.4 \pm 12.48$ ; Range: 0-58) has maximum score suggesting that these three factors had influence on the clinical competencies of ICU nurses. The factors especially teaching-coaching, diagnostic functions and work role are significantly influencing the level of the clinical competencies of ICU nurses.

There is significant association between the levels of clinical competencies of ICU nurses such as knowledge, experiences, environment, independence and work satisfaction with only four selected demographic variable i.e. age, usual length of shift duty the nurses work, average patient assignment and years of experience in the hospital.

The factor such as teaching-coaching is significantly associated with average patient assignment. Diagnostic functions' is associated with salary per month (in Rs.) of ICU nurses and work role is significantly associated with years of experience of ICU nurses.

**Conclusion:** The study concludes that the factors such as teaching-coaching, diagnostic functions & work role have maximum influences on the level of clinical competencies of ICU nurses.

**Keywords:** Clinical competencies, ICU nurses, teaching-coaching, diagnostic functions & work role

### **Introduction**

Nurses' competency includes core abilities that are required for fulfilling one's role as a nurse. Nurses are always challenged on how they can contribute to society as

professionals. They are expected to take professional responsibilities for continuously providing direct care, protecting individual lives and supporting activities of daily living.

A study was conducted by Notarnicola I *et al.* (2016)<sup>[1]</sup> on clinical competence in nursing: A Concept analysis. The findings of the study revealed that in nursing, clinical competence is a central issue for patient care and a clear understanding of the concept is critical for nursing education and nursing discipline. This concept analysis has defined clinical competence in nursing as a mix of skills, knowledge, attitude and abilities that each nurse must possess to perform acceptably those duties directly related to patient care, in a specific clinical context and in a given circumstances in order to promote maintain and restore the health of patients.

Professional communication competencies were only the significant predictors of nursing performance after socio demographic characteristics. In addition, the greater professional communication competencies of nurses were higher experience, higher educational level, more years of overall clinical and intensive care unit experience and higher monthly salary. The findings of the study indicate that communication skills- related training should be included in the practical education to improve nursing performance for the quality of intensive care. Karami A, Farokhzadian J & Foroughameri G<sup>[2]</sup> conducted a descriptive -analytic study to evaluate the nurses' professional competency and their organizational commitment as well as the relationship between these two concepts. Study was carried out in the hospitals affiliated with a University of Medical Science in the Iran. 230 nurses were selected using stratified random sampling. Data were gathered through socio demographic performa, competency inventory for registered nurse. (CIRM) and Allen Meyer's organizational commitment. Results showed that professional competency (Mean±SD: 2.82 ± 0.53, range 1.56- 4.00) and organization commitment (Mean±SD: 72.80 ± 4.95, range: 58-81) of the nurses were at moderate levels. There was no statistically significant correlational between professional competency and organizational commitment but there were significant differences in professional competency based on marital status (p=0.03) and work experience (p< 0.001).

**Materials and Methods**

The present study is based on descriptive survey design

where the investigator is interested to assess the level of clinical competencies of ICU nurses, identify the factors influencing nurses' clinical competencies in ICU. The factors could be theoretical knowledge, experiences, environment, independence and work satisfaction. The investigator is also interested to find out if any significant association is present or not between the level of clinical competencies and the demographic variables. The study was carried out in the selected ICU's of Health City Hospital, GNRC Hospitals, Hyatt Hospital and down town Hospitals of Kamrup (Metro) Assam. The sample size was 218 registered ICU nurses & sampling method used was simple random sampling. The tools used for data collection were Demographic Performa (to collect the baseline information), Level of nurses clinical competencies was assessed by using the observational checklist and the factors influencing the clinical competencies of the ICU nurses was assessed by the Nurses competence scale (Rating Scale). For the content validity & reliability the tool along with the statement and objectives is given to 5 experts'. Based on their expert opinion, modification is done. Nurse Competence Scale is a standardised scale used in the interest of public domain. The reliability of the tool is tested by using Guttman Split – Half Coefficient and 'r' was obtained 0.84 which indicated the tool is reliable. The investigator obtained a formal administrative permission from the Medical Director & the Nursing Superintendent of the selected Hospitals. The purpose of the study was explained to the nurses and written consent was taken from them and also assurance was given to maintain the confidentiality. The baseline data was collected from the samples using the structured interview schedule.

**Results**

Majority of nurses (43.6%) are in the age group of 25 -30 years, 85.3% nurses are female, 50.5% nurses are GNM. Majority of nurses (60.1%) works in the morning shift and their (61%) usual length of shift is 6 hours. Nurses (36.7%) get an average of two – three patient allocation. Majority (57.3%) nurses have 6months – 3 years of working experience in ICU. Majority (43.6%) of nurses under study has salary of Rs. 11000- 15000. Majority (81.2%) of nurses are unmarried and 87.2% has no children.

**Table 1:** Distribution of level of clinical competencies n=218

Score	1 <sup>st</sup> Observation		2 <sup>nd</sup> Observation		3 <sup>rd</sup> Observation		1 <sup>st</sup> Observation	2 <sup>nd</sup> Observation	3 <sup>rd</sup> Observation	P-value
	Frequency	%	Frequency	%	Frequency	%	Mean± S.D	Mean± S.D	Mean± S.D	
15-24	14	6.4	27	12.38	32	14.67	19.35± 3.348	18.88± 3.98	19.53±2.88	0.769 <sup>NS</sup>
25-37	19	8.7	29	13.30	37	16.97	32.73± 3.87	32.89±4.05	32.54±3.55	0.931 <sup>NS</sup>
38-48	185	84.86	162	74.31	149	68.34	44.87± 3.09	44.36± 2.86	45.16±2.876	0.314 <sup>NS</sup>

As per the score of observation checklist and consecutive three longitudinal observations, the maximum score of clinical competencies of ICU nurses are within the range of very good (38-48) with majority of nurses (84.86% in 1<sup>st</sup> observation, 74.31% in second observation and 68.34% in

third observation respectively %) with an average mean± SD of 44.87 ± 3.04, 44.36 ± 2.86 & 45.16 ± 2.876 respectively. There is no significant difference among the average of three observations made while assessing the level of clinical competencies of ICU nurses

**Table 2:** Range, Mean ±S.D of factors influencing clinical competencies of ICU nurses

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Teaching - Coaching	218	58.00	10.00	68.00	37.3532	10.06655
Diagnostic Functions	218	34.00	3.00	37.00	16.4083	4.56023
Work Role	218	58.00	.00	58.00	45.1514	12.48225
Valid N (listwise)	218					

Descriptive Statistics n=218

**Table 2:** Interprets that the factors especially teaching –coaching (37.66±10.06; Range: 10-68), diagnostic functions (16.6 ± 4.56; Range 3-37) and work role (45.4±12.48; Range: 0-58) has maximum score suggesting that these three factors had influence on the clinical competencies of ICU nurses.

Summary output					
Regression Statistics					
R Square				0.171834	
Adjusted R Square				0.144228	

  

Anova	df	SS	MS	F	Significance F
Regression	7	2141.051	305.8644	6.22460417	1.23E-06
Residual	210	10318.97	49.13796		
Total	217	12460.02			

**Table 3:** Association of the factors influencing clinical competencies and the level of competencies among the ICU nurses n=218

	Coefficients	Standard Error	t Stat	P-value	Inference
Intercept	93.12241	32.21439	2.890708	0.004247636	Not significant
Helping Role	0.165421	0.487834	0.339092	0.734879198	Not significant
Teaching - Coaching	-1.31747	0.487986	-2.69981	0.007503455	Significant**
Diagnostic Functions	0.996344	0.454076	2.194226	0.029315887	Significant**
Managing Situations	-0.64977	0.466012	-1.39433	0.16469156	Not significant
Therapeutic Interventions	-0.29852	0.450657	-0.66241	0.50843377	Not significant
Ensuring Quality	-0.05467	0.461631	-0.11843	0.905841637	Not significant
Work Role	0.200235	0.038873	5.150982	5.95528E-07	Significant **

\*\*Significant at  $p < .05$

Table no. 3: All assumptions followed by the regression model found to be valid and it interprets that  $H_1$  is established at  $p < .05$  5% level of significance; since the

factors especially teaching-coaching, diagnostic functions and work role are significantly influencing the level of the clinical competencies of ICU nurses.

**Table 4:** Association of level of clinical competencies of ICU nurses with selected demographic variables n=218

		Critical Care Nurse's Skill & Competency		Total	Chi Sq	df	Asym P	Fisher Exact P
		≤ Median	> Median					
Age	< 25 Yrs	47(38.8%)	23(23.7%)	70(32.1%)	7.80	3	.050	.050*
	25-30 Yrs	50(41.3%)	45(46.4%)	95(43.6%)				
	31-35 Yrs	11(9.1%)	18(18.6%)	29(13.3%)				
	>35 Yrs	13(10.7%)	11(11.3%)	24(11%)				
Gender	Male	14(11.6%)	18(18.6%)	32(14.7%)	2.10	1	.147	.179 NS
	Female	107(88.4%)	79(81.4%)	186(85.3%)				
Education	GNM	55(45.5%)	55(56.7%)	110(50.5%)	4.05	3	.256	.250 NS
	PB B.ScN	6(5%)	2(2.1%)	8(3.7%)				
	B.Sc. N	59(48.8%)	40(41.2%)	99(45.4%)				
	M.Sc. N	1(0.8%)	0(0%)	1(0.5%)				
Shift Duty	Morning	70(57.9%)	61(62.9%)	131(60.1%)	1.18	3	.758	.770 NS
	Evening	30(24.8%)	20(20.6%)	50(22.9%)				
	Night	8(6.6%)	8(8.2%)	16(7.3%)				
	Others	13(10.7%)	8(8.2%)	21(9.6%)				
Usual length of shift	6 Hrs	86(71.1%)	47(48.5%)	133(61%)	13.15	3	.004	.003**
	8 Hrs	28(23.1%)	37(38.1%)	65(29.8%)				
	10 Hrs	1(0.8%)	5(5.2%)	6(2.8%)				
	12 Hrs	6(5%)	8(8.2%)	14(6.4%)				
Average patient assignment	1-2	29(24%)	32(33%)	61(28%)	8.59	3	.035	.035*
	2-3	39(32.2%)	41(42.3%)	80(36.7%)				
	3-4	38(31.4%)	17(17.5%)	55(25.2%)				
	>4	15(12.4%)	7(7.2%)	22(10.1%)				
Years of experience in this hospital	6M - 3 Yrs	80(66.1%)	45(46.4%)	125(57.3%)	14.83	3	.002	.002**
	4- 6 Yrs	19(15.7%)	37(38.1%)	56(25.7%)				
	7-10 Yrs	14(11.6%)	8(8.2%)	22(10.1%)				
	> 10 Yrs	8(6.6%)	7(7.2%)	15(6.9%)				
Salary/ month (Rs.)	< Rs. 10000	2(1.7%)	0(0%)	2(0.9%)	2.84	3	.416	.501 NS
	Rs. 10000-15000	55(45.5%)	40(41.2%)	95(43.6%)				
	Rs. 16000-20000	30(24.8%)	31(32%)	61(28%)				
	> Rs. 20000	34(28.1%)	26(26.8%)	60(27.5%)				
Marital Status	Unmarried	99(81.8%)	78(80.4%)	177(81.2%)	0.07	1	.792	.862 NS
	Married	22(18.2%)	19(19.6%)	41(18.8%)				

No. of children	0	107(88.4%)	83(85.6%)	190(87.2%)	2.40	3	.494	.497 <sup>NS</sup>
	1	8(6.6%)	5(5.2%)	13(6%)				
	2	6(5%)	8(8.2%)	14(6.4%)				
	3	0(0%)	1(1%)	1(0.5%)				
Total		121(100%)	97(100%)	218(100%)				

\*\*Significant at  $p < .05$

H<sub>2</sub> is partially accepted at  $P < .05$ ; and at  $P < .01$ ; because there is significant association between the levels of clinical competencies of ICU nurses such as knowledge, experiences, environment, independence and work

satisfaction with only four selected demographic variable i.e. age, usual length of shift duty the nurses work, average patient assignment and years of experience in the hospital

**Table 5(a):** Association of factors influencing clinical competencies of ICU nurses with selected demographic variables

Model		Coefficients <sup>a</sup>			t	Sig.
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
1	(Constant)	36.816	7.236		5.088	.000
	Average patient assignment	-2.112	.877	-.178	-2.408	.017
	Years of experience in this hospital	.424	.296	.130	1.431	.154
	Salary/ month (Rs.)	.000	.000	.033	.452	.652
	Marital_Status	1.479	2.422	.062	.611	.542
	No. of children nurses's have	.091	1.544	.006	.059	.953

Dependent Variable: Teaching - Coaching \*\*Significant at  $p < .05$

H<sub>3</sub> is established at  $p < .05$ ; because there is a significant association of factors influencing clinical competencies of ICU nurses with selected demographic variables.

Factor such as teaching coaching is significantly associated with average patient assignments.

**Table 5(b):** Association of factors influencing clinical competencies of ICU nurses with selected demographic variables.

Model		Coefficients <sup>a</sup>			t	Sig.
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
1	(Constant)	14.049	3.308		4.247	.000
	Average patient assignment	.030	.401	.006	.074	.941
	Years of experience in this hospital	.004	.135	.003	.028	.978
	Salary/ month (Rs.)	34.086	6.436	4.288	4.129	0.000
	Marital_Status	-.132	1.107	-.012	-.119	.905
	No. of children nurse's have	.235	.706	.034	.333	.739

a. Dependent Variable: Diagnostic Functions \*\*Significant at  $p < .05$

H<sub>3</sub> is established at  $p < .05$ ; because there is a significant association of factors influencing clinical competencies of ICU nurses with selected demographic variables. A factor

such as diagnostic functions is significantly associated with salary/month.

**Table 5(c):** Association of factors influencing clinical competencies of ICU nurses with selected demographic variables

Model		Coefficients <sup>a</sup>			t	Sig.
		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
1	(Constant)	35.076	9.045		3.878	.000
	Average patient assignment	-.075	1.096	-.005	-.068	.946
	Years of experience	29.451	7.270	6.012	3.0217	0.000
	Salary/ month (Rs.)	.000	.000	.047	.639	.524
	Marital_Status	2.778	3.027	.094	.918	.360
	No. of children nurses's have	-1.327	1.930	-.070	-.687	.493

a. Dependent Variable: Work Role \*\*Significant at  $p < .05$

H<sub>3</sub> is established at  $p < .05$ ; because there is a significant association of factors influencing clinical competencies of ICU nurses with selected demographic variables. A factor such as work role is significantly associated with years of experience in ICU.

should have in clinical settings. Competence is a fundamental component of nursing care and plays an important role in the quality of services provided by nurses The present study results showed that majority of nurses (43.6%) are in the age group of 25 -30 years, 85.3% nurses are female, 50.5% nurses are GNM. Majority of nurses (60.1%) works in the morning shift and their (61%) usual

**Discussion**

Competence is one of the major requirements that the nurses

length of shift is 6 hours. Nurses (36.7%) get an average of two – three patient allocation. Majority (57.3%) nurses have 6 months – 3 years of working experience in ICU. Majority of the nurses has salary of Rs. 11000- 15000. Majority (81.2%) of nurses are unmarried and 87.2% has no children. As per the score of observation checklist and three longitudinal observations to assess the level of clinical competencies of ICU nurses, the maximum score of clinical competencies of ICU nurses are within the range of very good (38-48) with majority of nurses (84.86% in 1<sup>st</sup> observation, 74.31% in second observation and 68.34% in third observation respectively %) with an average mean  $\pm$  SD of  $44.87 \pm 3.04$ ,  $44.36 \pm 2.86$  &  $45.16 \pm 2.876$  respectively. There is no significant difference among the average of three observations made while assessing the level of clinical competencies of ICU nurses.

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There is significant association between the levels of clinical competencies of ICU nurses such as knowledge, experiences, environment, independence and work satisfaction with only four selected demographic variable i.e. age, usual length of shift duty the nurses work, average patient assignment and years of experience in the hospital

The factor such as teaching-coaching is significantly associated with average patient assignment. Diagnostic functions' is associated with salary per month (in Rs) of ICU nurses and work role is significantly associated with years of experience of ICU nurses.

The study findings were supported by a study conducted by Khomeiram, RT., Yepta, ZP., Kiger, A.M & Ahmadi, F (2006) [3] on 27 registered nurses in two university affiliated hospitals on professional competence: factors described by nurses as influencing their development. The findings suggested that the factors influencing the process of developing professional competence in nursing extend across personal and extra personal domains. Six descriptive categories were identified from the data: experience, opportunities, environment, personal characteristics, motivation and theoretical knowledge. An understanding of these factors may enhance the ability of nursing managers and educators to enable student and qualified nurses to pursue effective competency development pathways to prepare them to provide high standard of care.

The study findings were supported by a research study conducted by Zhang Z<sup>4</sup> on nursing competencies: personal characteristics contributing to effective nursing performance. Following the Mcber method, 50 experienced nurses were asked to report 82 valid critical incidents in their jobs. Ten competencies including interpersonal understanding; commitment, information gathering etc were identified. Skills, traits, motives and attitudes all contribute to effective nursing performance. It is required to develop nursing competencies and to provide realistic working behaviours for nursing education and management.

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