

Level of Competency and Need for Learning Strategies among ICU Nurses

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Abstract

Nursing in the context of client care includes the broader notions of professional development and competence. Nursing competence contributes to high quality care delivery, cost-effectiveness and more importantly better patient outcomes. This non-experimental design study sought to identify level of competency and need of learning strategy among ICU nurses using descriptive research approach. The subjects were taken from three hospitals termed as group 1, 2 and 3. A modified questionnaire, Competence Assessment, Planning & Evaluation Tool was used to score the nursing competencies on 10 domains related to human anatomical systems. The questionnaire was distributed to 10 nurses per hospital working in ICU, maximum score for each statement being 40 (well competent) and minimum score 10 (incompetent) in each domain. There was no statistical difference in the age group, education and experience of study subjects among all three groups except exposure to in-service educational programme ($p < 0.05$) and different groups scored differently. Significant difference was found in mean competence score among all 3 groups for some specific domains like procedures related to central nervous system, gastrointestinal system, cardio vascular system and endocrine system. Among demographical variables, competence score had a significant association with experience and exposure to training programme.

Nurses are accountable to the public to provide safe and quality care. They ensure that their practices and professional conduct meet legislative requirements and the standards of the profession. Nurses have significant contribution to make in the recovery of patients who have experienced critical illness. They need to build the competency to master information systems and use a wealth of knowledge to improve patient care (Bradshaw, 1998). Nursing competencies can lead to high quality care delivery, cost-effectiveness and more importantly better patient outcomes.

Zhang et al delineated the importance of studying nursing core competencies, as they would contribute to effective performance. Competency encompasses more than just a psychomotor skill. There exist various levels of competence but each of these has a minimum acceptable level (Brykezynski, 2002). Duffield et al (2006) generated a list of 149 nursing competencies by using the Delphi method as these are key elements for ensuring quality nursing care. The Competency Review Tool assists direct practice nurses to assess their knowledge of the competencies essential for safe, effective and ethical nursing practice.

The competencies also help nurses to reflect on how they demonstrate these basic competencies in their day-to-day practice, and to identify learning they may need to prepare for Practice Review. In the nursing profession, competency standards are used for nurses to measure their performance and prepare a professional development plan so that competence is maintained and enhanced (Buszta et al, 2009).

Need of the study

Providing optimal level of health care and ensuring patient safety has been a prime area of concern for nurses. In view of the unique characteristics, diverse needs of the critical ill patients and the higher severity of illness of patients, nurses need to enhance competence in terms of knowledge, skill and attitude to meet these challenges (Duffield et al, 2006). Therefore the present study made an effort to evaluate the level of competence among the nurses working in intensive care unit (ICU) by using Competency Assessment Planning & Evaluation (CAPE) tool.

Objectives

The objectives of the study were :

- ♦ To identify the level of competency and the spe-

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cific learning strategies among the nurses working in ICU,

- ♦ To compare the level of competence among the nurses working in selected ICUs, and
- ♦ To find the association of competence scores with selected demographic variables of the groups under study.

Assumptions

(i) Nurses working in ICU need to have specialised knowledge and skill, (ii) Nurses need to undergo structured educational modules in terms of theoretical and practical guidance to enhance their competency, (iii) Nurses working in ICU confront number of unavoidable factors which impede their competency.

Material and Methods

The design of present study was non-experimental type and used descriptive research approach. It was carried out in intensive care units of Northern Central Railways Hospitals, New Delhi, Lal Bahadur Hospital, Delhi and Metro Hospital, NOIDA in the month of August 2010. All the nurses working in intensive care units constituted the study population. Convenient purposive sampling was designed to select study subjects. The sample size was 10 nurses from each hospital working in ICU, thus making total to 30 subjects. The study subjects for Metro Hospital were presented as Group 1, Group 2 for Lal Bahadur Shastri Hospital and Group 3 for Railway Hospital. The nurses providing bed side care with more than one year of ICU experience were included. A semi-structured questionnaire (CAPE) tool with 10 domains (Basic procedures, Procedures related to Nervous system, Cardiovascular system, GI system, GU system, Respiratory system, Endocrine system, Musculoskeletal system, Reproductive system, and Haematological system) was developed (Tuhler et al, 1992). This tool had further 10 procedures in each domain, thus comprising of 100 items in 10 domains / parameters. To measure the responses given by subjects on level of competency they exhibit, each domain (10 procedure in each domain) was ranked for maximum score 40 to minimum score 10. The total questionnaire had 100 items and thus scores ranged from minimum 100 to maximum 400. Table 1 shows level of competency against the defined range of competency scores.

The tool was validated by experts in the field of critical care nursing. Reliability was checked

by Karl Pearson coefficient of correlation and its value was 0.975. Pilot study was conducted for checking the feasibility and practicality of the study.

Data was collected during the month of August 2010. As per ethical considerations, verbal consent from ICU nursing supervisor, the nurses providing direct patient care, present in morning and evening shift during study period were given the questionnaire for self assessment of their level of competence in terms of knowledge, skill and attitude. The anonymity of all subjects was maintained. The subjects were informed to fill their demographic data before filling the questionnaire. The last column of questionnaire was a multiple choice question regarding what learning strategy was required by the subjects to learn these competencies.

Results and Discussion

The data was analysed using descriptive and inferential statistics. The demographic characteristics showed that 70 percent subjects were in age group of < 30 years, 60 percent had hospital experience of < 5 years among all three groups. In context of gender, female had higher proportion (60% in group I, 50% group II, 70% group III); in education majority had General Nursing Midwifery diploma (90% in group I & II and 60% in group III). In regard to previous learning exposure related to intensive care nursing practices, all (100%) subjects had undergone training programme in group I, 20 percent in group II and 60 percent in group III.

Overall scores of questionnaire in each group showed that 50 percent (n=5) of the study subjects scored in the range of 200-299 (level of competence 2) and rest 50 percent score in range of 300-399 (level of competence 3) in group 1. In group II, 10 percent (n=1) of the subjects scored between 100-199 (level of competence 1) and 90% (n=9) scored between 200-299 (level of competence 2). On the other hand, 100 percent (n=10) of the study subjects scored between the range of 200-299 (level of

Table 1: Description of level of competency and competency score range

Level of competence	Scores range	Remarks
1	100-199	Limited knowledge, never performed the procedure and needed constant supervision
2	200-299	Adequate knowledge but person needs intermittent supervision to attain knowledge and skill
3	300-399	Person has adequate knowledge and skill but need standards to attain competency
4	400	Person is well competent to do the procedure according to professional standards

Table 2: Nurse's Competence scores for each domain among subjects

(Max score=40, min score=10 for each domain)

Domains	Competency scores			p-value	Group I vs Group II	Group I vs Group III	Group II vs Group III
	Group I Mean $\pm$ SD	Group II Mean $\pm$ SD	Group III Mean $\pm$ SD				
Basic procedures	32.8 $\pm$ 3.29	24.5 $\pm$ 3.09	26.3 $\pm$ 2.71	0.01	0.01*	0.01*	0.148
Procedure related to CNS*	35.5 $\pm$ 1.08	23.1 $\pm$ 2.54	26 $\pm$ 2.46	0.01	0.01*	0.01*	0.004*
Procedure related to CVS*	32.1 $\pm$ 2.60	21 $\pm$ 5.57	25 $\pm$ 4.38	0.01	0.01*	0.01*	1.00
Procedure related to respiratory system	31.5 $\pm$ 2.67	22.6 $\pm$ 4.29	25 $\pm$ 3.59	0.01	0.01*	0.01*	0.544
Procedure related to GI system*	32 $\pm$ 3.65	25 $\pm$ 1.77	26 $\pm$ 2.76	0.01	0.01*	0.01*	0.30
Procedure related to GU system*	31.7 $\pm$ 2.45	28 $\pm$ 3.47	27 $\pm$ 4.03	0.01	0.01*	0.131	0.12
Procedure related to endocrine system	30.9 $\pm$ 1.91	25.7 $\pm$ 3	26 $\pm$ 2.86	0.01	0.01*	0.01*	0.41
Procedure related to reproductive system	23 $\pm$ 4.02	26.5 $\pm$ 4.50	24.5 $\pm$ 3.65	0.164	1.00	0.19	0.59
Procedure related to musculoskeletal system	25.5 $\pm$ 5.03	27.4 $\pm$ 5.9	26.5 $\pm$ 5.10	0.736	1.00	1.00	1.00
Procedure related to haematological system	31.7 $\pm$ 3.02	30.5 $\pm$ 4.67	28.4 $\pm$ 3.02	0.29	1.00	0.37	0.96

* Significant at $p < 0.05$

CNS: Central nervous system; CVS: Cardio vascular system; GI: Gastro intestinal system; GU: Genito-urinary system

competence 2) in group III. The scores were further calculated for each domain among all three groups which are shown in Table 2.

One way analysis of variance (ANOVA) was used to measure the significance of difference between these groups by p value as shown in Table 2. Difference was separately calculated for group I & II, group I & III and group II & III. Domains like basic procedures, procedures related to CNS, CVS, respiratory, GI, Endocrine systems had significant difference between competence scores of group I & group II and group I & group III ($p = 0.01$ at, $p < 0.05$). On the other hand, no significant difference (at $p < 0.05$) was found among scores of domains like procedures related to reproductive system (p value 1.0 for group I & group II; 0.19 for group I & group III and 0.59 for group II & group III), musculoskeletal system ($p = 0.736$ for Group I & group II, 1.00 for group I & group III and group II & group III), haematological system ($p = 1.0$ for group I & group II, 0.37 for group I & group III and 0.96 for group II & group III).

The level of competence was derived according to competence scores. The difference among level of competence for each domain among all groups is shown in Figure 1.

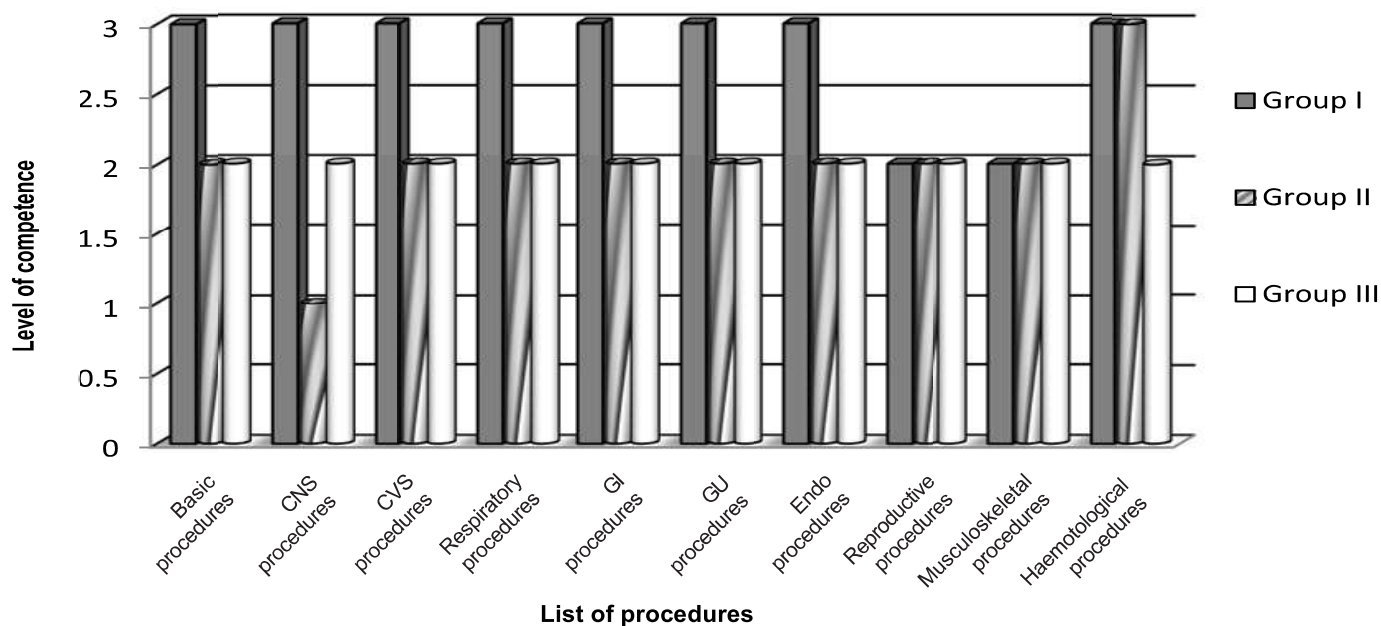
In order to enhance competency level, 37 percent subjects urged the need of in-service education programme and 63 percent subjects in conduction of workshops related to ICU procedures. To find out the association of competence scores with demographic variables, a significant association was found between variables like experience and exposure to educational programme at $p < 0.05$ level.

Discussion

The study sought to measure advanced clinical competences in three different hospitals located in Delhi and NCR. The tool (questionnaire) used in the study was CAPE with 10 domain and 100 items. A similar study was conducted by Health Care and Social Wel-

fare Department, Finland on the assessment and evaluation of advanced clinical competence of emergency department nurses using Nurse Clinical Competence Scale (NCCS) which has 60 items with 4-point scale. The study used the concept of ICU nurses self assessment on their competence level with varied age group, experience and exposure to in-service education programme among all three groups. In group I, 50 percent of the subjects needed intermittent supervision to attain knowledge and skill and rest 50 percent of the subjects had adequate knowledge and skill but needed standards to attain competency. In group II, 10 percent of the subjects were found incompetent in knowledge and skill and rest 90 percent need intermittent supervision to attain competence. Similarly in group III, all 100 percent of the subjects need intermittent supervision to attain competence. In comparison of competence scores for each domain among three groups (Table 2) there was significant difference among competence scores in group I & II and group I & III in parameters like basic procedures, procedures related to central nervous system, cardiovascular, and endocrine system. However, no significant difference was found (at $p < 0.05$) between the competence scores of domains like reproductive system, musculoskeletal system and haematological system in group I & II and group I & III and group II & III. The demographic variables like experience and exposure to in service educational activity were significantly associated with competence score. Interestingly, all 100 percent of the subjects in group I had undergone exposure to educational programme related to ICU procedures which proved to be an important factor for higher

Figure 1 : Level of competence for each domain among subjects in three groups



score in group I.

The findings given by Canadian Association of Critical Care Association showed that nurses working in specialised ICU with exposure of regular in service educational activities are more competent in terms of knowledge and skill than general ICU and emergency department nurses. A study conducted by Rogers et al 2002 on factors related to ICU nurses' competency level showed that inproportionate nurse patient ratio, lack of decision making in patient care, lack of interest, lack of adequate infrastructure and equipment and lack of training programme are major contributing factors (account for 50-60%) which ultimately affects quality patient care.

Conclusion

The study showed that subjects working in group I scored higher level of competence (50% subjects with level 3) than group II (90% level 2) and group III (100% level 2) in all the domains except domains related to reproductive, musculoskeletal and haematological system where the difference in score was found non-significant. Group II and group III had almost same competence level in all the domains. The study subjects emphasised the need of learning strategy in form of workshops or regular in service educational activities to update with ICU procedures.

Recommendations

- ◆ Nurses should be updated with regular training modules as per specialised area of working to enhance their competence and provide safe

quality patient care.

- ◆ There should be control on other important factors like adequate nurse patient ratio as per hospital norms, availability of necessary equipment and infrastructure, performance-based promotion, motivation and learning enthusiasm among nurses to provide well competent care. A minimum level of performance should be laid out for the nurses working in specialised units like ICU, which should be regularly appraised by unit in charge so as to provide competent care. Also, similar type of study can be done on large samples in different settings for generalisation of the findings. A quasi experimental study can be carried out to evaluate the effectiveness of competence-based programme in terms of nurse's outcome for ICU nurses.

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