

Medication Activity Frequency, Competency and Educational Needs among Nurses

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Abstract

This study is performed in order to comprehend the medication activity frequency, competency and educational needs, and analyse the elements that affect the perceived competency. The subjects for this study are 216 nurses and the collected data by using SPSS 18.0 program. In nurses' needs for medication education, 'Recording the contents of medication' shows the highest score 6.74(± 12.642), 'Understanding of medication according to the patient's age and gender' shows the lowest, 5.68(± 9.011). From this result, we can infer that we will need to search for a scheme that can fortify the clinical education related to medication for the nurses. And nurses should maintain and improve their competency through continuous and systematic medication education

Keywords: Competency, Medication Activity Frequency, Educational Needs

1. Introduction

The medication is the most traditional and the widest treatment so to become the most core prevention and remedy for diseases¹. Especially, since nurses are in mutual relations for 24 hours a day with patients as providing direct cares to them, the hospital should pay attentions on the nurse work related to the safety control². In order for a nurse to provide safe and good quality care to the patient, the medication of a nurse is very important. Medication is one of the nurse's most important and basic skills. Moreover, the increase of drug variety, the action and side-effect of drug, the change in the medication method/path, the use of new devices related to drug and others caused by the change in the medical service system and the development of medicine require sufficient medication capability for any nurse³.

Therefore, the medication activity performed with accurate knowledge and capability becomes one of utmost important responsibilities for nurses. However, most medication errors accounting for the highest proportion of all medical malpractices⁴ are said to occur when medication capacity is not enough and medication error not only for

mistake to the nurse and cause a huge loss to the medical institution⁵ and therefore, it is important that nurse have enough medication capacity to prevent administration errors and provide safe nursing care.

That is, medication is one of the main duties of nurses and requires the most time and accounts for more than 20% of all nursing duties from simple medication to education for drug implementation, effect evaluation and records etc.². Nurses responsible for the medication should acquire accurate knowledge on the action and side-effect, the medication method and the pharmacokinetics regarding the relevant drug before providing drug to the patient to prevent any error on the medication. Medication accidents frequently occurring recently become the critical cause to initiate general people's distrust on medical institutions. Such accidents also are possible to cause fatal results to patients so that significant negative impacts are resulted to hospitals causing the responsibilities for mistakes to individual nurses. When a medication error occurs, the incident should be resolved first through the systematic approach. However, the report and the search for the solution regarding the accident do not emerge on the surface because of the

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fear on the accusation and the responsibility be receive by the revealing of accident in society⁵. While errors on the medication may occur in various courses, the role of nurse is very important since the final performer of medication is the nurse⁶. Such medication error is very critical since its prevention reduces unnecessary medical costs and protects the life of patient⁷.

Until now, most previous studies are about medication errors of nurses so in this study, we are to analyse the frequency of administration activities of nurses and examine the ability to perform administration subjectively to identify the needs for nurses' medication education.

2. Methodology

2.1 The Study Design

This study is a cross-sectional descriptive survey to identify the degree of needs for nurses' administration education and determine relevant factors. General hospital nurses were randomly selected as subjects of this study and data have been collected from March 10 to March 21, 2014.

2.2 The Study Subject and the Sampling Method

Subjects of this study are 216 nurses at C national university hospital in the scale of 1,000 beds or more located in D Metropolitan City. The approval for the study is acquired by explaining on the purpose and the procedure of the study to the nursing department before distributing the questionnaires. For the specific selection criteria, nurses who understand the purpose of this study, agree to participate as the study subject and perform the medication nursing in the general and the special wards of the relevant hospital at the time of survey in March, 2014 are selected.

2.3 The Study Tool

For this study, measurement tools for the frequency of medication activity, the objective capability for medication performance and the need for medication education developed by Lee, Ye Eun³. The creditability of each tool at the time of development is Cronbach's alpha >0.90 while the creditability of test-retest is >0.80. In this study, Cronbach's alpha of frequency scale of medication activity is 0.949, Cronbach's alpha of the objective capability for medication performance is 0.997 and Cronbach's alpha of the need for medication education is 0.993.

2.4 The Analysis Method

For this study, the statistic process of collected data is analysed by using SPSS 18.0 Program as followings: The general characteristics of nurses are researched through the frequency analysis. And, the average and the standard deviation are calculated to find the medication activity frequency, the objective capability for medication performance and the need for medication education. T-test and One-way ANOVA are performed to find differences in medication activity frequency, the objective capability for medication performance and the need for medication education according to general characteristics of the nurses. To find relationships among the medication activity frequency, the objective capability for medication performance and the need for medication education, Pearson's Correlation Coefficients are calculated. The above statistical significance is tested with the level of $\alpha=0.05$.

3. Findings

3.1 The General Characteristics of Subjects

216 female nurses subjected in this study show in Table 1. First, the average age is 29.62(± 6.13) years. Nurses in the ages of 25-29 years take the largest portion as being 73 nurses (33.8%). For the religion, 111 nurses (51.4%) answer as none taking the largest portion. For the final school, the university graduates are 99 nurses (45.8%) to be the largest. For the marital status, 147 nurses (68.1%) are unmarried taking the largest. For the position, 205 nurses (94.9%) are at the normal position to be the largest. For the department, 176 nurses work at the general ward (81.5%) to be the largest. The average career show to be 77.21(± 71.38) months while 112 nurses under 5-years (51.9%) taking the largest portion. For the cause to become a nurse, 90 nurses (41.7%) answer to have selected the nurse according to the self-will taking the largest portion.

3.2 The Medication Activity Frequency

The average medication activity frequency of the nurses show to be 4.54 ± 0.65 . On items, 'Fluid Therapy' (5.37 ± 0.88) shows the highest frequency followed by 'Intravenous Injection' (5.29 ± 1.01), '6 Rights Check' (5.22 ± 0.94), 'Asepsis Application on the Drug Preparation' (5.16 ± 0.88), 'Patient Chart Check on Drugs' (4.97 ± 0.95), 'Narcotics Control' (4.97 ± 1.05) and 'Drug Safety Control' (4.93 ± 1.00) in order (Table 2). Differences in the medication activ-

Table 1. The general characteristics of subject

Characteristics	Divisions	Frequency	%
Age	20-24 years-old	50	23.1
	25-39 years-old	73	33.8
	30-34 years-old	44	20.4
	35 years-old or older	49	22.7
	M±SD	29.62±6.13 years-old	
Region	Protestant	71	32.9
	Buddhism	13	6.0
	Catholic	19	8.8
	None	111	51.4
	Others	2	0.9
Final School	Professional College Graduate	65	30.1
	University Graduate	99	45.8
	In Graduate School	25	11.6
	Graduate School Graduates	27	12.5
Marital StatusPosition	Married	69	31.9
	Unmarried	147	68.1
Position	General nurse	205	94.9
	Chiefnurse	8	3.7
	Head nurse	3	1.4
Department	General ward	176	81.5
	Special department	40	18.5
Nursing Career	Less than 5 years	112	51.9
	5-9 years	48	22.2
	10-14 years	37	17.1
	15 years or longer	19	8.8
Application Cause for Nursing	M±SD	77.21±71.38 months	
	Self-will	90	41.7
	Others' recommendations	65	30.1
	Job security	47	21.8
	Academic score	8	3.7
	Aptitude, interest and others	6	2.8
Total		216	100.0

ity frequency according to general characteristics of the nurses are as Table 3. For the age level, nurses of 30-34 years-old show the highest medication activity frequency. For the final school, the high level of medication activity frequency is shown in the order as Graduate School or higher (4.73 ± 0.75), Professional College Graduate (4.53 ± 0.59) and University Graduate (4.44 ± 0.61) with the significant statistic difference ($F=3.403$, $p=.035$). For the position, General Nurse shows the higher medication activity frequency compared to Chief/Head Nurse, but with no significant difference. And no significant difference is found for the department, the career and the application cause for nursing.

3.3 The Objective Capability for Medication Performance

The objective capability for medication performance of the nurses is scored with the 6 points at the highest as in Table 4. The average level of objective capability for medication performance is 5.10 ± 0.74 shown to be relatively higher. For items, the capability of '6 Rights Check' (5.39 ± 0.97) shows the highest level followed by 'Asepsis Application on the Drug Preparation' (5.28 ± 0.88), 'Intravenous Injection' (5.24 ± 0.98), 'Understanding on Cautions, Side-Effects and Prohibition for Drug' (5.23 ± 0.76), 'Patient Chart Check on Drugs' (5.22 ± 0.86), 'Narcotics

Table 2. The medication activity frequency

	Items	M±SD
1	Drug Amount Calculation	4.38±1.17
2	Medication Time Calculation	4.63±1.17
3	6 Rights(Patient, Drug, Amount, Path, Time and Record) Check	5.22±0.94
4	Allergy Check	4.69±0.98
5	Patient Chart Check on Drugs	4.97±0.95
6	Asepsis Application on the Drug Preparation	5.16±0.88
7	Fluid Therapy	5.37±0.88
8	Blood Transfusion	4.48±1.29
9	Intravenous Injection	5.29±1.01
10	Intramuscular Injection	4.44±1.29
11	Subcutaneous Injection	4.55±1.20
12	Intradermal Injection	4.16±1.38
13	Local Medication (Skin, Eye, Nose, Ear, Rectum, Vagina and etc.)	3.38±1.29
14	Fixed Amount Inhaler Medication	3.72±1.32
15	Central Venous Catheterization(CVC)Management	3.98±1.28
16	Infusion and Syringe Pump Use	4.09±1.24
17	Drug Safety Control	4.93±1.00
18	Narcotics Control	4.97±1.05
19	Drug Training Performance	4.80±1.03
20	Patient Support for Drug Therapy Performance	4.76±0.97
21	Effect Evaluation of Drug Training	4.47±1.14
22	Effect Evaluation of Drug Treatment	4.60±0.99
23	Patient Conditions before/after Medication	4.86±0.87
24	Monitoring on Clinical Levels	4.69±1.16
25	Record of Drug Treatment Description	4.69±1.07
26	Report on Medication Accident	2.85±1.68
27	Medication Error Prevention	4.75±1.03
28	Interdisciplinary(Colleagues Nurses, Doctors and Pharmacists) Communication regarding Drugs	4.5±1.10
29	Drug Related Information Check through Advice	4.21±1.12
	Total	4.54±0.65

Control'(5.22±0.94) and 'Drug Safety Control'(5.21±0.91) in the order of higher performance capability. In the meanwhile, the performance capability of 'Understanding of Medication according to the Age and the Gender of Patient'(4.80±0.80) show to be the lowest followed by 'Local Medication'(4.89±1.04) and 'Fixed Amount Inhaler Medication'(4.89±0.99) in the order of lower performance capability

The result on the objective capability for medication performance according to general characteristics of the nurses shown in Table 5. First, for the age, the nurses show higher objective capabilities for medication performance as in the age order of 35 years-old or older (5.33±0.62),

30-34 years-old (5.18±0.82), 25-39 years-old(5.10±0.69) and 20-24 years-old (4.80±0.79) referring the trend that higher age shows higher objective capability for medication performance along with the significant statistic difference ($F=4.790$, $p=.003$). According to the result of post-verification, the nurses in the ages of 35 years-old or older, 30-34 years-old and 25-39 years-old are found to have significantly higher objective capabilities for medication performance than the nurses in the ages of 20-24 years-old.

For the final school, the nurses show higher objective capabilities for medication performance as in the order of Graduate School or higher (5.36±0.54), Professional

Table 3. The medication activity frequency according to the characteristics of subjects

Division		N	M±SD	t or F	Duncan Test
Age	20-24 years-old	50	4.44±0.48	0.592	a<c
	25-39 years-old	73	4.57±0.64		
	30-34 years-old	44	4.61±0.70		
	35 years-old or older	49	4.53±0.75		
Final School	(a) Professional College Graduate	65	4.53±0.59	3.403 [*]	
	(b) University Graduate	99	4.44±0.61		
	(c) Graduate School or higher	52	4.73±0.75		
Position	General nurse	205	4.56±0.60	1.038	
	Chief/Head nurse	11	4.18±1.19		
Department	General ward	176	4.55±0.65	0.364	
	Special department	40	4.50±0.64		
Career	Less than 5 years	112	4.46±0.58	2.297	
	5-9 years	48	4.73±0.69		
	10-14 years	37	4.57±0.57		
	15 years or longer	19	4.40±0.95		
Cause for Application	Self-Will	90	4.54±0.72	-.031	
	Other than Self-Will	126	4.54±0.59		
Total		216	4.54±0.65		

* $p < .05$

College Graduate (5.09 ± 0.69) and University Graduate (4.97 ± 0.84) with significant statistic differences ($F=4.820$, $p=.009$). According to the result of post-verification, the nurses having the background of Graduate School or higher are found to have significantly higher objective capabilities for medication performance than nurses graduated from professional colleges or universities.

For the position, Chief/Head Nurses (5.50 ± 0.49) show higher objective capabilities for medication performance than General Nurses (5.08 ± 0.75) with significant statistic differences ($t=-2.738$, $p=.017$).

For the nursing career, the nurses show higher objective capabilities for medication performance as in the order according to their careers of 15 years or longer (5.40 ± 0.64), 5-9 years (5.26 ± 0.78), 10-14 years (5.20 ± 0.79) and less than 5 years (4.95 ± 0.70) with significant statistic differences ($F=3.655$, $p=.013$). According to the result of post-verification, the nurses having careers of 15 years or longer show significantly higher objective capabilities for medication performance than the nurses having careers of less than 5 years.

For the department, Special department nurses are found to have higher objective capabilities for medication performance than General ward nurses with no significant differences.

3.4 The Medication Training Demand

The need for medication education for the nurses is scored with the 6 points at the highest as in Table 6. The level of average objective capability for medication performance is 5.05 ± 0.65 to be relatively higher. For the items, the training demand on '6 Rights Check' (5.31 ± 0.81) followed by 'Intramuscular Injection' (5.25 ± 0.74), 'Blood Transfusion' (5.25 ± 0.79), 'Intravenous Injection' (5.24 ± 0.78), 'Asepsis Application on the Drug Preparation' (5.21 ± 0.82), 'Subcutaneous Injection' (5.21 ± 0.81), 'Narcotics Control' (5.19 ± 0.81) and 'Intradermal Injection' (5.17 ± 0.84) as in the order of higher training demand.

3.5 The Medication Activity Frequency, the Objective Capability for Medication Performance and the Medication Training Demand

The result of correlation analysis to find the relationship among the medication activity frequency, the objective capability for medication performance and the need for medication education for the nurses shown in Table 8. First, the medication activity frequency of the nurses is found to have significant positive (+) correlations with

Table 4. The objective capability for medication performance

Items	M±SD
1 Understanding of Medication according to the Age and the Gender of Patient	4.80±0.80
2 Understanding of Drug related Medical Terms and Abbreviation	5.08±0.85
3 Understanding of Medication Path according to Drug Shape	5.12±0.84
4 Understanding of Drug Action and Treatment Effect	5.13±0.74
5 Understanding on Cautions, Side-Effects and Prohibition for Drug	5.23±0.76
6 Drug Amount Calculation Medication Time Calculation	5.11±0.85
7 6 Rights(Correct Patient, Drug, Amount, Path, Time and Record) Check	5.12±0.91
8 Understanding of Prescription	5.39±0.97
9 Allergy Check	5.13±0.93
10 Patient Chart Check on Drugs	5.14±0.87
11 Asepsis Application on the Drug Preparation	5.22±0.86
12 Blood Transfusion	5.28±0.88
13 Intravenous Injection	5.19±0.94
14 Intramuscular Injection	5.24±0.98
15 Subcutaneous Injection	5.14±1.06
16 Intradermal Injection	5.16±1.03
17 Local Medication (Skin, Eye, Nose, Ear, Rectum, Vagina and etc.)	5.08±1.06
18 Fixed Amount Inhaler Medication	4.89±1.04
19 Central Venous Catheterization(CVC) Management	4.89±0.99
20 Infusion and Syringe Pump Use	5.13±0.87
21 Drug Safety Control	5.10±0.90
22 Narcotics Control	5.21±0.91
23 Drug Training Performance	5.22±0.94
24 Patient Support for Drug Therapy Performance	5.06±0.87
25 Effect Evaluation of Drug Training	5.00±0.89
26 Effect Evaluation of Drug Treatment	4.99±0.88
27 Patient Conditions before/after Medication	5.03±0.89
28 Monitoring on Clinical Levels	5.13±0.90
29 Record of Drug Treatment Description	5.00±0.91
30 Report on Medication Accident	5.04±0.92
31 Medication Error Prevention	4.94±0.98
32 Interdisciplinary(Colleagues Nurses, Doctors and Pharmacists)	5.12±0.92
33 Communication regarding Drugs	5.02±0.93
34 Drug Related Information Check through Advice	5.00±0.87
Total	5.10±0.74

the objective capability for medication performance ($r=.362$, $p<.001$) as well as the need for medication education ($r=.489$, $p<.001$) referring that the nurses with higher medication activity frequencies have higher medication performance capabilities and higher demands on the medication training.

It is also found that significant positive (+) correlation exists between the objective capability for medication performance and the need for medication education ($r=.500$, $p<.001$) referring that the nurses with higher objective capabilities for medication performance have higher demands on the medication training.

Table 5. The Objective capability for medication performance according to subjects' characteristics

Division		N	M±SD	t or F	Duncan Test
Age	(a) 20-24 years-old	50	4.80±0.79	4.790**	a<b
	(b) 25-39 years-old	73	5.10±0.69		a<c
	(c) 30-34 years-old	44	5.18±0.82		a<d
	(d) 35 years-old or older	49	5.33±0.62		
Final School	(a) Professional College Graduate	65	5.09±0.69	4.820**	a<c
	(b) University Graduate	99	4.97±0.84		b<c
	(c) Graduate School or higher	52	5.36±0.54		
Position	General Nurse	205	5.08±0.75	-2.738*	
	Chief/Head Nurse	11	5.50±0.49		
Department	General Ward	176	4.55±0.65	-.342	
	Special Department	40	4.50±0.64		
Career	(a) Less than 5 years	112	4.95±0.70	3.655*	a<d
	(b) 5-9 years	48	5.26±0.78		
	(c) 10-14 years	37	5.20±0.79		
	(d) 15 years or longer	19	5.40±0.64		
Cause for Application	Self Will	90	5.07±0.80	-.466	
	Other than Self Will	126	5.12±0.70		
Total		216	5.10±0.74		

* $p < .05$, ** $p < .01$

4. Discussion

Only positive (+) correlations are found among the medication activity frequency, the objective capability for medication performance and the need for medication education of the nurses. The study of Gang, Ji Yeon⁸ shows a similar result to this study result for showing the significant correlation between the training intervention performance capability and the performance frequency in the survey on the training intervention performance capability and the performance frequency with nurses at emergency rooms. Therefore, to improve the objective capability for medication performance, it is considered that the help should be provided for nurses to be ready with the medication performance capability through periodical and systematic trainings focusing on the activities with low frequencies.

Significant differences are found in the objective capability for medication performance for nurses according to general characteristics including the age, the final school, the total career and the current position. This outcome is similar to the results of report in the previous studies related to the capability⁸⁻¹⁰ that the age, the final school and the total clinic career show statistical significance

with the capability and the result of report in the previous study¹⁰ analyses the nursing capability and the related factors of nurses that the clinical career is the influential factor for the nursing capability of nurses.

In the study of Lee, Ye Eun¹¹, the result of research on the need for medication education according to general characteristics of nurses shows significant differences according to the age, the final school, the total career, the current position and the department while the group of 25 years-old or younger, new nurses with careers less than 1 year in general positions shows the highest training demand. The nurses in this group recognize the objective capability for medication performance as low. However, this study shows that as the objective capability for medication performance is higher, the nurses show higher demands on the medication training. Through such result, a training for each of career level is found to be required for nurses.

This study shows the understanding capability of medication according to the age and the gender of patient shows to be the lowest in the objective capability for medication performance of nurses. The inadequacy of drug amount calculation is presented as a cause for the medication error as in the results of previous studies^{12,13}.

Table 6. The medication training demand

Items	M±SD
1 Understanding of Medication according to the Age and the Gender of Patient	4.87±0.77
2 Understanding of Drug related Medical Terms and Abbreviation	4.91±0.75
3 Understanding of Medication Path according to Drug Shape	4.91±0.78
4 Understanding of Drug Action and Treatment Effect	4.97±0.80
5 Understanding on Cautions, Side-Effects and Prohibition for Drug	5.01±0.80
6 Drug Amount Calculation Medication Time Calculation	5.04±0.82
7 6 Rights(Correct Patient, Drug, Amount, Path, Time and Record) Check	5.31±0.81
8 Understanding of Prescription	5.09±0.77
9 Allergy Check	5.04±0.81
10 Patient Chart Check on Drugs	5.11±0.80
11 Asepsis Application on the Drug Preparation	5.21±0.82
12 Blood Transfusion	5.25±0.79
13 Intravenous Injection	5.24±0.78
14 Intramuscular Injection	5.25±0.74
15 Subcutaneous Injection	5.21±0.81
16 Intradermal Injection	5.17±0.84
17 Local Medication (Skin, Eye, Nose, Ear, Rectum, Vagina and etc.)	4.99±0.88
18 Fixed Amount Inhaler Medication	4.99±0.88
19 Central Venous Catheterization(CVC) Management	4.92±0.84
20 Infusion and Syringe Pump Use	5.05±0.82
21 Drug Safety Control	5.10±0.82
22 Narcotics Control	5.19±0.81
23 Drug Training Performance	5.09±0.82
24 Patient Support for Drug Therapy Performance	5.02±0.80
25 Effect Evaluation of Drug Training	4.95±0.85
26 Effect Evaluation of Drug Treatment	5.02±0.82
27 Patient Conditions before/after Medication	5.09±0.78
28 Monitoring on Clinical Levels	4.97±0.87
29 Record of Drug Treatment Description	5.02±0.86
30 Report on Medication Accident	4.88±1.00
31 Medication Error Prevention	5.02±0.85
32 Interdisciplinary(Colleagues Nurses, Doctors and Pharmacists) Communication regarding Drugs	4.97±0.81
33 Drug Related Information Check through Advice	4.92±0.85
Total Objective Capability for Medication Performance	5.05±0.65

5. Conclusion

This is a descriptive survey to identify frequency of medication activities, medication ability and needs for medication education of nurses.

The study results are as follows: The frequency of medication activities was found to be in the order of prevention of medication errors, medication education performance,

intradermal injection, fluid therapy, intravenous injection and ability to perform medication in the order of intravenous injection, dose calculation, drug injection time calculation, intradermal injection, drug education and it turned out that there are differences in frequency and capacity of actual administration activities of nurses.

Finally, needs for medication education were found to be in the order of recording the contents of medica-

Table 7. The Medication training demand according to subjects' characteristics

Division		N	M±SD	t or F	Duncan Test
Age	(a)20-24 years-old	50	4.79±0.67	7.495*	a<c
	(b)25-39 years-old	73	4.94±0.65		a<d
	(c)30-34 years-old	44	5.23±0.59		b<c
	(d)35 years-old or older	49	5.30±0.57		b<d
Final School	(a)Professional College Graduate	65	4.92±0.67	8.348*	a<c
	(b)University Graduate				b<c
	(c)Graduate School or higher	99	4.96±0.64		
Position	General nurse	205	5.03±0.66	-1.805	
	Chief/Head nurse	11	5.39±0.50		
Department	General ward	176	5.03±0.66	-1.010	
	Special department	40	5.14±0.59		
Career	(a)Less than 5 years	112	4.85±0.61	7.862*	a<b
	(b)5-9 years	48	5.18±0.75		a<c
	(c)10-14 years	37	5.30±0.53		a<d
	(d)15 years or longer	19	5.35±0.50		
Cause for Application	Self-will	90	5.08±0.71	-.031	
	Other than Self-will	126	5.03±0.61		
Total		216	5.08±0.71		
			5.03±0.61		

* $p<.001$ **Table 8.** The medication activity frequency, the objective capability for medication performance and the medication training demand

Division	The Medication Activity Frequency	The Objective Capability for Medication Performance	The Medication Training Demand
The Medication Activity Frequency	1		
The Objective Capability for Medication Performance	.362*	1	
The Medication Training Demand	.489*	.500*	1

tion, understanding of drug action and treatment effect, intramuscular injection, applying aseptic technique in preparation of drug, intradermal injection. Based on the results of this study, it was found that continuous and individualised medication education is necessary for nurses and it can be said that medication education related programs need to be developed and applied in the future.

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