HOSPITAL NOTES

Nursing Resource Utilization Based on Activity Score

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Introduction

Nursing personnel in the hospital play key role in delivery of health care services. Resource crunch is the limiting factor to achieve efficient and effective service. Shortage of nurses is currently a problem in several countries and an important question is therefore how one can increase the supply of nursing staff (1, 2). Shortage of professional staff in a hospital can drastically increase operating costs and compromise the quality care (3). It may not always be true that the more manpower will yield more output. Deployment of nursing personnel in ward areas always remained a controversial matter and is considered as the major causes of inter-personnel conflicts in hospitals. It is a tedious task to carry out healthcare delivery for the masses without rationalizing human resources in the form of reallocation and redeployment of health care personnel (4).

Approximately 60-70% recurring budget of government owned hospital is consumed for the salary of human resource. Managerial efficiency dictates to achieve maximum output by utilizing minimum input and optimum utilization of the manpower. Nursing component deployed in any speciality ward is approximately 50- 60% of the total manpower strength of the ward. They deliver direct medical/ nursing care. In view of shortage of the manpower special attention to be paid while we think about the deployment & utilization, some innovative methodology to be worked out which enhances the deployment and cuts the cost (5,6,7) Health care is labour intensive and staffing costs are often a major focus of the health sector. There is a tendency for staffing to be regarded as part of the problem of cost containment and staffing costs are the often a major focus of heath sector reform (8). Very often it has been observed that doctors are much interested to deploy maximum number of nurses for their ward and management feels that it is not true but proportionate number of nurses to be deployed in each ward depending upon direct/ indirect nursing care involvement in that particular ward. Under such situation sometime to be devoted to plan and coordinate the care,

a hospital wide programme to be developed and implemented to improve the nursing assistant use and productivity (9). A similar shortage situation was faced at SGPGI of Medical Sciences, Lucknow, U.P., India due to non availability of suitable nursing staff. Therefore hospital administration was bound to go far a study to assess the nursing workload in each ward and deploy accordingly later on with following objectives. To identify the various types of direct and indirect nursing care activities rendered to the indoor patients to asses the optimum work load specific to specility care and to frame the criteria for deployment of the nursing staff in various wards to have optimal utilization of manpower.

Materials and Method

The study was conducted at a Tertiary Care Medical institute having about 24-speciality department with 600 beds in 2005. The Medical Services are rendered by about 150 faculties, 250 Senior Residents, 600 nursing personnel, 175 technical and other support staff. The hospital has about 150000 outdoor, 23000 indoor patients and 6000 operation per year. The annual bed occupancy is around 73%. It also performs around 1100000 investigations per year. The study was undertaken for a period of one month, during April-May, 2005. All wards of the hospital were included in the study. During study period critical observations were made on each nursing activities by the trained investigators. Bed compliment and bed occupancy from daily census report, available with the nursing officer was collected every day. The nursing care activities were categorized in two major groups i.e. direct nursing care and indirect nursing care. Twenty-five direct and four indirect activities were identified for the purpose of study and these are presented in *table-1*. Based on the extent of involvement of the nursing personnel, points were allotted to each activity in the range of 0.25 to 4.0. The allotment of activity point for each type of activity was based on past experience, direct/ indirect involvements, time devoted and skill used by nurses. The work load score was defined by the number of activities

performed multiplied by its score. The information regarding all these activities was collected on daily basis, for the entire period of study. Maximum and minimum workload ward areas were thus identified based on total activity scores obtained and accordingly areas for optimal and minimal utilization of nursing personnel were also identified.The study was repeated during July- August 2006 to asses the consistency of findings of first study. Differences in two studies were identified and reasons for the same were also recorded and are discussed.

Results

The bed strength, activity score, estimated requirement of nursing manpower is presented in *table 2.* Overall BOR in both the studies for selected wards was 71.04 and 70.64 respectively. This ranges from 43.75 to 98.66. The total activity score in both studies was 1827.89 and 2208.89 respectively. The range of activity score was 43.96 to 186.1. Based on activity score MICU, Gastro Medicine- A and Nephrology-A wards were ranked among the first 3 wards in both studies. While the ranking of these wards based on BOR was not consistent. According to activity score Immunology, Hematology, RT and Genetics are ranked lowest among 3 wards in both the studies. It is observed that BOR over both studies has remained almost same (within 10%) in most of the wards except a few e.g. MICU, Urology-A Neurology-A. It was also noted that in some wards there was decline in BOR but increase in activity score (Med Gasrto-A and B, Surg Gasrto-A, Nephrology-B Neurology-A and urology-B). Nursing deployment in both the study was same, which ranges from 10-13 where as based on the activity score the estimated requirement was projected from 5 to 17and 6 to 19 in first and second study respectively. The finding reveals that some areas such as MICU, Nephrology- A, Medical Gastroenterology,

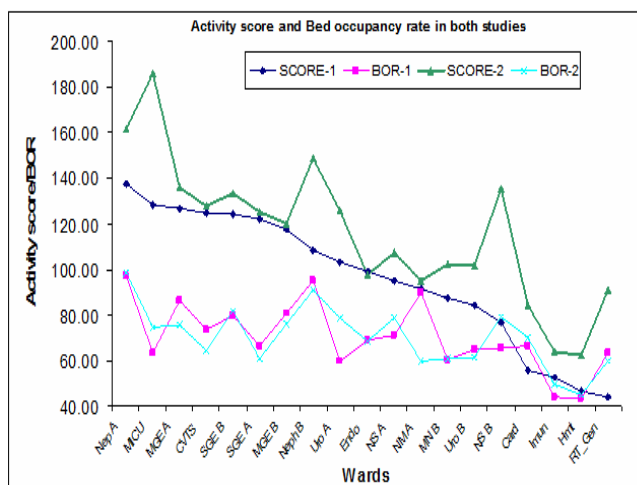### Fig 1. Bed Occupancy Rate and Activity Score

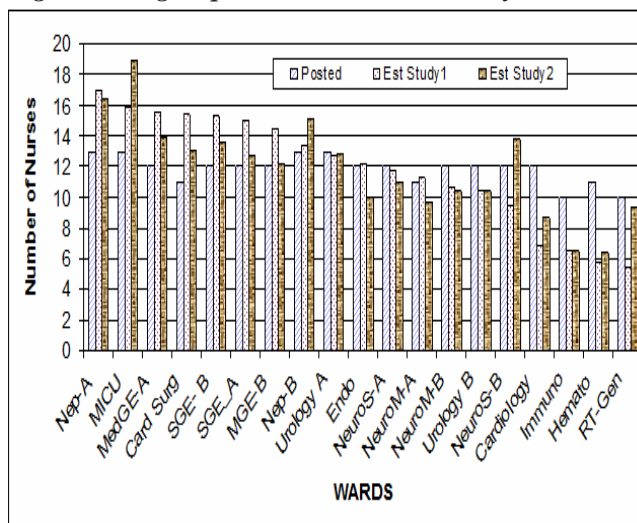### Fig 2. Nursing Requirement Based on Activity Score

Table 1. Scores for Various Nursing Activities

Sl.	Activity	Point allotted	Sl.	Activity	Point allotted
	Direct Activity*				
1.	IV. fluid infusion	0.5	18.	Pre-coma state	1.0
2.	CVP line	1.0	19.	Unconsciousness state	2.0
3.	Blood/component transfusion	1.0	20.	Cardiac arrest	4.0
4.	Oxygen inhalation	1.0	21.	Death	5.0
5.	Intubation/ventilator	2.0	22.	ECG in ward by S/N	0.25
6.	Monitor only	0.75	23.	Investigation within the ward	0.25
7.	Infusion pump	1.0	24	Sample collection routine investigation	
8.	Ryle's tube	0.5		Upto 10 /day	1.0
9.	Urinary catheter	0.5		Upto 20 /day	2.0
10.	Chest drainage tube	1.0		Above 20 /day	3.0
11.	Other drainage	0.5	25.	Sample collection urgent investigation	as above
12.	Bed sore	1.0		**Indirect Activity**	
13.	Wound dressing	1.0	1.	Bed making for complete ward	2.0
14.	Intake-output measurement	0.5	2.	TPR charting for complete ward	2.0
15.	Pre-operative procedure	0.5	3.	Drug distribution for complete ward	1.0
16.	Post-operative procedure	1.0	4.	Prepare tray for CSSD	1.0
17.	Other procedures on ward patients	1.0		* points allotted are for each activity	

Table 2. Activity Score, Bed Occupancy, Deployed and Estimated Number of Nurses During Both Periods of Study

SL	Name of the ward	Bed Strength	No of Nurses posted	First Study			Repeat Study		
				Activity Score	BOR (%)	Est Nurse1	Activity Score	BOR (%)	Est Nurse
1	Nephrology A	30	13	137.70	97.12	17	161.75	98.66	16
2	MICU	22	13	128.68	63.32	16	186.10	74.77	19
3	Med Gastroenterology A	30	12	127.00	86.67	16	136.05	76.00	14
4	Cardiac Surgery	30	11	125.00	73.64	15	128.00	64.66	13
5	Surg Gastroenterology B	30	12	124.10	80.00	15	133.75	82.00	14
6	Surg Gastroenterology A	30	12	122.10	66.67	15	125.25	61.16	13
7	Med Gastroenterology B	30	12	117.70	80.76	14	120.20	76.33	12
8	Nephrology B	30	13	108.28	95.15	13	148.82	91.33	15
9	Urology A	30	13	103.60	59.85	13	126.05	78.83	13
10	Endocrinology (Med+Surg)*	30	12	99.30	69.21	12	98.00	68.47	10
11	Neuro Surgery A	30	12	95.10	71.10	12	107.43	78.66	11
12	Neurology A	30	11	91.43	89.86	11	95.30	60.00	10
13	Neurology B	30	12	87.33	60.65	11	102.23	61.16	10
14	Urology B	30	12	84.50	64.85	10	102.08	61.33	10
15	Neuro Surgery B	30	12	76.93	65.50	9	135.57	79.60	14
16	Cardiology	30	12	55.68	66.67	7	84.70	70.33	9
17	Immunology	30	10	52.95	43.95	7	64.03	49.66	7
18	Hematology	24	11	46.55	43.75	6	62.58	45.00	6
19	Radiotherapy+Genetics*	30	10	43.96	63.50	5	91.00	60.10	9
	All	556	225	1827.89	71.04	225	2208.89	70.64	225

Cardiac Surgery require more nurses and some of the areas like Cardiology, Immunology, Hematology and Radiotherapy require less nurses *(Table 2, Fig.1 & 2)*.

Discussion

Based on above facts it is revealed that however the workload of the nursing care may increase with increase in the bed occupancy but the BOR is not directly proportional to the workload of the ward. Therefore the BOR is not the key factor in assessing the workload of nursing care in the ward as it does not have direct correlation with the utilization of nursing personnel. Moreover the workload depends upon the activities involved in patient care such as criticality/ severity of the patient, which is possible even in low BOR. Therefore activity score appears to be better criteria for allocation and utilization of nursing manpower. These findings are based on statistical analysis but may be cumbersome to implement. There are several other considerations which are to be kept in mind such as nursing fatigue, administrative work, leave reserve and compensation for prolonged night duties. Therefore more studies would be needed to assess the impact of these additional factors. This study is a systematic attempt focusing at the nursing personnel utilization based on their professional involvement with the patients. The study reveals that bed occupancy rate (BOR) is not the only factor responsible for increase in nursing care load. There are several other factors that increase the load of care such as criticality or severity of the patient. The findings of study suggest that reallocation of staff be done based on the activity score of the individual ward. The study and the criteria (activity point) for the study can be taken as a model by other hospitals for assessing the nursing personnel allocation and the utilization

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