



ACTIVITY ANALYSIS OF NURSING STAFF WORKING IN SURGICAL ICU OF A TERTIARY CARE MULTISPECIALTY HOSPITAL OF DELHI

Medical Science

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ABSTRACT

Background: Rapidly evolving medical science, with high cost of patient care mandates optimization of all resources including the human resource and nursing staff forms the backbone of this system. The whole process demands measurement of nursing workload in order to determine nursing staff requirements in any medical care centre. Activity analysis is an accepted scientific tool to measure the category of work being performed by the workforce across all the industries.

Aim: To carry out an Activity analysis of the Nursing staff working in a Surgical Intensive Care Unit of a tertiary care multispecialty hospital in Delhi.

Objectives: To carry out activity sampling of nursing staff functioning in surgical ICU and to determine whether the reallocation of work is possible for efficient use of their time while in patient care.

Materials & Methods: The activity sampling of nursing staff involved in surgical ICU was carried out for a period of 8 days, 19 to 20 Mar 2018 with a pilot study of 2 days. Data collection was carried out for 06 days. The activity sampling technique was applied for clock period of 24 hours. Based on the findings of pilot study, minimum sample size was calculated to be 157, but 576 observations were made to increase the statistical power of the study. Activities were coded and recorded for the data collection.

Results: Total productive time observed was 90% and 90% as nonproductive activities. Patient care complex got maximum recording as compared to the share contributed by other activities. The percentage activities contributed by patient care were that of 57.6% (13.8 hrs) of total time taken for nursing care. Off station activities were found very less i.e. 0.8% of total activities and Clerical activities, Administrative activities & supply & maintenance activities were recorded as 13.6%, 5.2% & 4 % respectively.

Conclusion: Nursing staff devoted their maximum time in activities related to patient care. However, it is recommended that activities related to patient care can be further increased by reducing the time devoted to other Non-patient care activities like administrative, clerical and non-productive. Proper job identification and job distribution is a mandatory prerequisite for optimal use of Human resource. Automation by improving the Hospital information System of the hospital can help reduce the burden of tedious documentation process and improve patient care.

KEYWORDS

INTRODUCTION BACKGROUND:

- Intensive care unit is the most complex patient care area of a hospital that is staffed and equipped to look after critically ill patients with potentially reversible lesions who are unable to communicate their needs or who require extensive nursing care and almost constant observation regardless of diagnosis, sex and economic status. The patients admitted here generally have dysfunction or failure of one or more organs, particularly Respiratory and Cardiovascular systems. Patients usually require intensive monitoring, and most need some form of mechanical or pharmacological support such as mechanical ventilation, renal replacement therapy, or vasoactive drugs.
- The Alma Ata declaration of 1978 pronounced the cherished goal for all nations of world i.e. "Health for All" by year 2000 [1]. In 1980, the Govt of India, appointed the working group to draft a strategy for achieving the above goal by year 2000 [2]. In order to achieve the above objective the resources are needed to meet the health care needs of the community. No nation in developing world, however rich, is rich enough to meet the needs for all health care activities hence the requirement to utilize the resources optimally. The basic resources required for providing efficient health care activities are [3]:
 - Human resources.
 - Money & Material.
 - Time & Information.
- The identification of the nursing staff requirements in an intensive care unit (ICU) environment is relevant not only for nursing care planning but also for appropriate management of human resources. Decisions for resource allocation based solely on evidence of efficacy of medical care are not rational decision making. The care that is harmful or ineffective should not be gratified medically & socially [4].
- High costs of intensive care as well as quality of care and patient safety, demands measurement of nursing workload in order to determine nursing staff requirements. It is also important to be aware of the factors related to high patient care demands in order to help forecast staff requirements in intensive care units (ICUs). Medical decision-making for resource allocation is a

complex process that frequently obscures the true rationale of choice [4].

- The staffing norms suggested for health care personnel are one doctor per 3,500 populations, & one nurse & one auxiliary nurse mid wife each for 5000 population [5]. As per Shetty, Committee appointed in by Central Council of Health in year 1954, the recommended nurse patient ratio should be one per three beds in teaching hospitals & one per five beds in other hospitals [6]. However, in many of the hospitals especially in government hospitals the present state is beyond the prescribed norms.
- The WHO expert committee on nursing services defines nursing services as a part of total health care organization which aims to satisfy the nursing needs of community. The nursing care required for prevention of disease, promotion of health & is required in the interest of his mental & physical comfort by reason of the disease from which he is suffering [7].
- In hospital the nurse patient ratio varies with type of patient receiving care, designing of inpatient area (Open vs closed ICU, availability of isolation cubicles & shape of ICU like semicircular vs rectangular type, & provision of equipments for observation of critically ill patient from distant location) where the health care is provided, volume of patient load receiving health care services & skill of nurses involved for providing health care services.
- In area like ICU, where the works are more demanding & challenging, the nursing staff required for care should have highest qualities of competence & character. There is a wide range of nursing care in ICU that includes observation of patient, the basic care of patient, the care & observation of apparatus, recording & interpretation of vital parameters & the emotional support of patients & their relatives. [8].

Nursing Norms in ICU.

- The nurse patient ratio in ICU should be adequate enough to the meet the needs of critically ill patients. Most of the hospital today follows the Staff inspection unit norms in our country which recommends the Nurse patient ratio to be 1:1 [9]. The recommended nurse patient ratio varies between 1:1 & 1:2 during day & evening shifts & between 1:2 & 1:3 on night shift [10]. A Swiss estimate requires the ratio of 2 to 2.5:1 in 6 to 8 bedded ICUs & 1 to 1.5:1 in 12 bedded ICU [10]. BIS recommends one staff

- nurse/nursing sister for every bed of ICU [10].
12. The Intensive care is synonymous with 1:1 nurse patient ratio [11]. Following factors should be taken into account while assessing appropriate staffing level in ICU:
 - Patient throughput, case-mix and dependency.
 - Nursing staff skill-mix and experience.
 - Medical staff skill and availability.
 - Unit layout.
 - Training requirements.
 13. In order to compensate the annual & professional leave, sickness & maternity leave, the nurse patient bed ratio should be minimum of 6.3 WTE per bed & may be enhanced up to 7 per bed if full complement of bed is to be maintained at all time [13].
 14. In order to reduce the work stress & associated absenteeism among nurses the adequate nurse patient ratio & judicious implementation of nursing duty in shift should be essential for maintaining quality of care to critically ill patient. When the working week of 36 hours, the day pass not exceeding six & the night pass of eight hours is adapted, a staff increase may be expected. As noted by a British observer that whenever standard working hours & absenteeism are taken into account the relationship of nurses with one bed have been worked out as 4.3:1. The same by another UK writer have been formulated as 4.25:1 with taking consideration of holidays & occasional absences [12].

Need for work study:

15. According to Putsep, the question of quality of health care is the question of supervision & better management of available resources. In order, to do so, there is a mandatory need to analyse the jobs presently carried by the nurses & to reallocate the jobs, depending upon their relative importance, so that an administrator can be able to get efficient utilization of knowledge, technical skills & expertise of nursing staff involved in providing care to critically ill patients. This can be possible through applying a well established tool i.e. "work study" which gives information about both productive & nonproductive nursing activities which helps in redesigning of nursing allocation for obtaining better patient care.
16. Larkin stated that work study is a management service based on method study and work measurement, which are used in the examination of human work in all its contexts which lead to the systematic investigation of all the resources and factors affecting the efficiency and economy of the situation being reviewed, in order to effect improvement.
17. Work study is the systematic examination of the methods of carrying on activities so as to improve the effective use of the resources & to set up standard of performance for the activities being carried out (ILO). The principal techniques used to measure work are as follows:
 - (a) Pre-determine motion time system
 - (b) Time study
 - (c) Analytical estimating
 - (d) Activity or work sampling

Activity sampling & Nursing services:

18. Derbyshire, in her solo study, as well as in the study along with Subhadra, used activity sampling to analyse the activities of nursing personnel.
19. Time motion study, was conducted on a sample of 30 nurse shifts at a Montreal hospital. The sample was observed by trained observers who timed nurses' activities for their entire working shift using hand held personnel digital assistant. The activities were grouped into direct patient care, indirect patient care, non nursing & personal activities. Break & meal time were excluded from the denominator of total worked hours. The main activity categories observed were 32.8% for direct care, 55.7% for indirect care, 9% non nursing tasks & 2.5% personal activities. The three activities like communication among health personnel, medication preparation & documentation were comprised of 78.9% of indirect care time. The author concluded that the time motion studies are a useful method of monitoring appropriate use of nursing staff, & may provide results that assist in restructuring nursing task.
20. Activity sampling involves intermittent & instantaneous observation of activities being carried out by workers under observation. The observations are carried out at certain regular

interval. Lesser is the time interval between observations, more reliable is the study. This type of study reveals following information:

- (a) General picture of type of activities performed by each category of personnel.
- (b) Distribution of type of activities at times when they are observed.
- (c) The activities that consume most time.

21. The steps adopted in activity sampling are:

- (a) Recording of activities at certain regular interval.
- (b) Tabulation of observed activities.
- (d) Analysis of tables and inferences drawn with respect to the productive and Non Productive nature of activities performed.

22. Based on the above back ground, it was decided to carry out an activity analysis of the Nursing staff in Surgical Intensive Care Unit of a tertiary care multispecialty hospital in Delhi.

AIM & OBJECTIVES OF STUDY

Aim

To carry out an Activity analysis of the Nursing staff in a Surgical Intensive Care Unit of a tertiary care multispecialty hospital in Delhi.

OBJECTIVES

1. To carry out activity sampling of nursing staff functioning in surgical ICU.
2. To determine whether the reallocation of work is possible for efficient use of their time.

METHODOLOGY

1. The work measurement study of nursing staff involved in surgical ICU of a tertiary care multispecialty hospital in Delhi was carried out for a period of 8 days 19 to 20 Mar 2018.

Study Period: Pilot study (2 days) – 19 & 20 Mar 2018, Data collection (06 days) – 21 to 26 Mar 2018. The activity sampling technique was applied for clock period of 24 hours.

2. The details about activities related to job of nursing staff were obtained through interview of Senior Administrative Nurse, Medical & Nursing Staff of Surgical ICU. Through interview, the information related to ward routine, shift system & functions of nursing staff in detail were obtained. One week in advance surgical ICU was frequented to establish rapport & to minimise the Hawthorne effect, to the extent possible & to identify various tasks performed by nursing staff in this unit. The tasks observed were grouped into eight categories as suggested in Darbyshire.

3. The details about grouping of activities for this study are elucidated as under:

- (a) Patient care basic
 - (i) Hygiene care
 - (ii) Comfort
 - (iii) Nutrition
 - (iv) Body part
 - (v) Social aspects
- (b) Patient care complex
 - (i) Noting of health status
 - (ii) Preparation for procedure
 - (iii) Carry out procedure
 - (iv) Assisting in procedure
 - (v) Supportive care
 - (vi) Preparation of chart

© Administration

- (i) Related with internal organization of unit
- (ii) Supervision assessment
- (iii) Nursing coordination

- (d) Clerical work
 - (i) Paper work
 - (ii) Oral communication

- (e) Housekeeping
 - (i) Light housekeeping
 - (ii) Heavy housekeeping

- (f) Maintaining supply & eqpt
- (i) Medicine supply
- (ii) Linen supply
- (iii) Housekeeping
- (iv) Maintaining inventory
- (v) Indenting drugs
- (vi) Checking drugs
- (vii) Checking diet

- (g) Off station: When workers are not present in unit
- (i) Accompanying patient
- (ii) Unit message
- (iii) Stand by

- (h) Non productive care
- (i) Personal care

- (ii) Reporting on-off duty
- (iii) Meal time
- (iv) Personal hygiene
- (j) Training & Education

4. Pilot study was conducted for 2 days i.e. 19 and 20 March 2018 to records observation for calculation of sample size. After which the actual data collection was done. 24 hours observations were recorded by dividing the total period into 3 parts. The observation for 1st 8 hrs period was recorded on 21 & 22 Mar 2018 (7 am to 3 pm). The observations for 2nd 8 hrs shift were recorded on 23 & 24 Mar 2018 (3 pm to 11 pm). The observations for last 8 hrs shifts were taken on dt 25 & 26 Mar 2018 (11 pm to 7am).
5. Under each group of activity, the code number of individual items of observation was marked. The serial number of listing, being mentioned under each group above, was used as the code number. After the record of observation for a period of 24 hrs, the same were tabulated & computed to draw inferences.
6. **Sampling method** : In this study the sampling method adopted was non probability sampling ie, consecutive sampling of Nursing staff working in the surgical ICU and activity sampling at the time of study was carried out.
7. **Determination of sample size** : To determine the productive and non-productive activities of Nursing staff in Surgical ICU, the first 100 observations of activities performed were recorded as a pilot study.

Productive activities – 89 (89%)

Non Productive activities – 11 (11%)

8. Minimum sample size is calculated by using the formula suggested by Curie R.M and Faraday.

$$N = 4 \times p(100-p)/L^2$$

N = total Number of observation made

L = Limit of the permitted variation (+/- percentage variation)

P = Observed % of time spent on the particular activity

To determine N, first 100 observations were made in the pilot study. The data was tabulated and analyzed to calculate the percentage (p) devoted to activity (productive activities) considering the value of “L” as +/- 5 %. In activity sampling most commonly used standard is the 95% confidence limit [13].

9. Based on the above formula minimum sample size was calculated as.

N = Total Number of Observation

L = limit +/- 5%

p = 89 % (Productive activity)

$$N = 4 \times p(100-p)/L^2$$

N = $4 \times 89(11)/5^2 = 156.64 = 157$ Observations

* Minimum sample size is 157

OBSERVATIONS & DISCUSSION

1. The hospital had a total of 132 Nursing staff posted. Out of this posted strength, 14 are mostly held as administrative appointments like chief Matron, assistant Matron, Administrative Matron, Matron Family wing, Matron OT and ICU complex of hospital etc & the posts are being handled by senior nursing officer. At any given time, about 30% nurses are on leave, courses

etc. Therefore about 70% nurses are found available in hospital for providing patient care.

2. Working shift of nurses in surgical ICU: The nursing officers in ICU work in three shifts of 8 hrs each. There are two nurses available in each of the three shifts at any given point of time. So there are two nurses per 10 beds available to work, thus the effective nurse patient ratio followed in the ICU of this tertiary care hospital under study is 1:5.
3. Duty off: The nursing staffs that are on night duty are given one day off for each week of night duty at the end of their weekly duty. On the other hand nursing staff on day duty are given two day off at the end of their monthly duty.
4. The above fact reflects that the nurse patient ratio is very far from ideal 1:1 ratio. So, the effective patients load per nurse in this ICU is very high. Although, there are number of trainee nurses working in the ICU who provide little help in jobs but still fail to compensate the ideal nurse patient ratio as mentioned above.

OBSERVATIONS OF ACTIVITY SAMPLING:

5. Minimum sample size for the study was calculated as 157. However, a total of **576 observations** made were during the total 24 hrs period to increase the statistical power of study. The details are being mentioned as under:

- (a) Observation during 1st 8 hr shift on 21 & 22 Mar 2018 (7am to 3pm) $(2 \times 134) = 268$
- (b) Observation during 2nd 8 hr shift on 23 & 24 Mar 2018 (3pm to 11pm) $(2 \times 96) = 192$
- (c) Observations during 3rd 8 hr shift on 25 & 26 Mar 2018 (11pm to 7am) $(2 \times 58) = 116$

Total = 576

Note: Symbol * indicates number of nursing staff available in surgical ICU.

6. Distribution of staff time on various groups of activities: Details are given in table as under & figure No-2.

S. No.	Group of activity	No. of observations	Percentage	Time wise distribution (in Hrs)
1.	Patient care Basic	132	22.8	5.47
2.	Patient care complex	201	34.8	8.35
3.	Clerical duty	78	13.6	3.26
4.	Non productive	58	10	2.4
5.	Supply & maintenance	30	5.2	1.24
6.	Administrative	23	04	0.96
7.	Education	16	2.8	0.67
8.	House keeping	34	06	1.44
9.	Off station	4	.8	0.19
Total		576	100	23.98 = 24 hrs (approx)

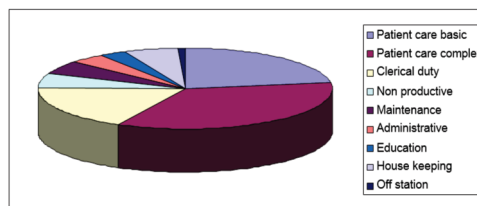


Figure-2: Group wise distribution of Nursing staff activities in ICU

7. The table & figure-2 reflects that the activity share in respect of Patient care complex got maximum as compared to the share contributed by other activities. The percentage activities contributed by patient care (both patient care complex & basic) was that of 57.6% (13.8 hrs) of total time taken for nursing care.
8. The total non productive time observed was that of 10%. It means that 90% productive activities were shown by nursing staff in surgical ICU.
9. Off station activities were found very less i.e. 0.8% of total activities observed. In all 2 occasions the nurses went to medical ICU to assist staff & to take emergency medicine. Therefore, these activities are also considered productive.
10. Clerical activities, administrative activities & supply & maintenance activities were of 13.6%, 5.2% & 4 % respectively.

11. Non productive activities that involve personal care like rest & relaxation, meal time, reporting on & off time were that of 10% of total observed activities in 24 hrs.

Patient Care Basic:

12. The total of 132 observations was done under the heading of patient care basic. The details are mentioned in table as under:

S. No.	Group of activity	No. of observations	Percentage	Time wise distribution (in Hrs)
1.	Hygiene care	29	21.05	1.15
2.	Comfort	30	22.81	1.24
3.	Nutrition	16	12.28	.67
4.	Body part	30	22.81	1.24
5.	Social aspect	27	21.05	1.15
Total		132	100	5.47 hrs (approx)

Under this group of activities the activities related with care of body part, patient comfort & patient hygiene was observed more. Activities related to social aspects were also noticed substantially. However, the activities related with nutritional care i.e. feeding of patients were found less i.e. 12.28% of total Patient Basis Care activities.

Patient Care Complex:

13. The distribution of this group of activities into various elements is as under:

S. No.	Group of activity	No. of observations	Percentage	Time wise Distribution (in Hrs)
1.	Noting of health status & accompany spl round	40	19.32	1.69
2.	Preparation for procedure	37	18.18	1.53
3.	Carry out procedure	20	10.23	0.85
4.	Assist in procedure	23	11.36	0.94
5.	Supportive care	37	18.18	1.51
6.	Charting	44	21.60	1.83
Total		201	100	8.35 hrs (approx)

Under this group of activities the activity element related with charting was found highest (21.6%) than the other elements. Involvement of nurses to carry out procedure & for assisting in procedure were found least as compared to the other activity elements.

14. For noting of health status & specialist round, the time spent was 19.32% of total complex patient care time.

15. The procedure carried by nurses are mostly Ryle's tube aspiration, suction, administration of oxygen, antibiotic sensitivity test & injection of antibiotic, IV line insertion, introducing & removing urinary catheter, etc. The complex procedures like lumbar puncture, making CVP line, applying oxygen inhalation line; plural aspiration etc are found to be mainly conducted by Resident Medical Officer. For these procedures nurses was found assisting the Medical Officer in ICU.

Clerical Duty

16. The activities related with clerical duty are basically divided into paper work & oral communication. The details are mentioned in table as under:

S. No.	Group of activity	No. of observations	Percent age	Time wise distribution (in Hrs)
1.	Paper work	60	75	2.44
2.	Oral communication	19	25	0.82
Total		79	100	3.26 hrs (approx)

17. The clerical activity related to paper work was accounted for 75% of total activities. These activities are paper work related with preparing investigation form & maintaining indent & expense book, inventory register, writing of report book, specimen dispatch book, sister's duty report book, urgent indent book, bacterial testing records & fumigation records.
18. The clerical activities related to oral communication were mostly pertaining to administrative purpose & patient care purpose. The works related with oral communication were accounted for 25% of total clerical work. The nurses were found communicating on

telephone for demand of ambulance vehicles for shifting in step down wards of hospital, calling for specialists for care of emergency cases, calling for paramedical staff for X-ray, ECG & collection of samples for lab test & for getting urgent lab investigation reports on telephone. For administrative purpose, they were found involved in passing instructions to administrative staff, paramedical staff, other trainee nurses, getting instructions from MOs & specialists & other higher authority & through telephone with Principal Matron office.

Administration

19. The details of activities related with administration are mentioned in table as under:

S. No.	Group of activity	No. of observations	Percentage	Time wise distribution (in Hrs)
1.	Internal organization unit	9	40	0.38
2.	Supervision assessment	9	40	0.38
3.	Nursing coordination	5	20	0.20
Total		23	100	0.96 hrs (approx)

House keeping

20. The details of activities related to housekeeping are mentioned in table as under:-

S. No.	Group of activity	No. of observations	Percent age	Time wise distribution (in Hrs)
1.	Light duty	20	59	0.85
2.	Heavy duty	14	41	0.59
Total		34	100	1.44 hrs (approx)

21. The observations of elements related with house keeping activities were divided into light duty & heavy duties. The nurses were found involved mainly in light duty activities having total of 20 observations (equivalent to 0.84 Hrs). The heavy housekeeping activities (41% equivalent to 0.59 hrs) were performed mainly by Nursing assistants & Medical assistant thus these two personnel assist nursing staff for housekeeping activities.

Supply & maintenance activity

22. The details of observations recorded in respect supply & maintenance are being mentioned in table as under:

S. No.	Group of activity	No. of observations	Percent age	Time wise distribution (in Hrs)
1.	Medicine & nursing items	3	7.71	0.096
2.	Condemning items	2	7.69	0.095
3.	Maintaining inventory	2	7.69	0.095
4.	Indenting drugs	5	15.38	0.190
5.	Checking drugs	14	46.15	0.572
6.	Checking diet	4	15.38	0.190
Total		30	100	1.24 (approx)

23. The Nursing Staff spent 46.15% of their time i.e (0.572 hrs) in checking drugs for the required details before taking medicine in stock & before dispensing it to patients. Indenting drugs and checking diets accounted for 15.38% each.

Educational activities

24. The hospital also carries lot of education & training courses for its staff. Therefore, Nursing staff were found involved in teaching activities for Trainee Nurses and Paramedic. Total numbers of observations in respect of educational activities were noted to be 17 ie 2.8% of observation.

Off-Station duty

25. The activities related to Off-station duty were being performed mainly by Medical Assistants. Therefore, the observations related with Off-station duty were very less. Only 4 (0.19 Hr) observations were noticed in respect of Off-station duty. Off-station duty involves activities like accompanying patient during transport, unit message involvement & keeping stand by.

Non productive activity

26. Total observations noticed in respect of Non Productive Activities were 58 in numbers. The details of observations related to Non

Productive Activity elements are being mentioned in table as under:-

S. No.	Group of activity	No. of observations	Percent age	Time wise distribution (in Hrs)
1.	Personal	25	42	1
2.	Reporting on-off duty	10	17	0.408
3.	Meal time	4	08	0.192
4.	Personal hygiene	19	33	0.792
		58	100	2.4 hrs (approx)

27. The Nursing staff spent 42% of their Non Production time in personal affairs which accounted for 1 hr of the Non Productive Time. Amount 33% of the observation were related to personal hygiene, which is a positive activity pertaining to infection control in patient care.

Summary & Recommendations

1. The activity sampling of Nursing staff in Surgical/ICU of a tertiary care hospital in Delhi, were conducted into three shift over a period of 8 days (2 days Pilot studies + 6 days data collection) from 19 Mar 2018 to 26 Mar 2018.
2. A pilot study of 2 days (19 and 20 Mar 2018) was conducted in order to get the number of production and Non Productive Activities performed by the Nursing staff posted in the Surgical ICU. Based on the findings of pilot study the minimum sample size work up to 157 (89% Production and 11% Non production). However, A total of 576 observation were recorded to improve the statistical power of study.
3. The nursing officers in surgical ICU spent 57.6% of total time in direct patient care activities, comprising of 34.8% complex patient care & 22.8% basic patient care.
4. The proportion of time spent in productive activities was that 90% (518 observation/ 216 hrs) which is higher than other workers findings. It was due to low nurse patient bed ratio & the patients admitted in ICU were that of surgical cases that required more care.
5. The proportion of time required for direct nursing care of critically ill patients in this study was that of 13.82 hrs, out of total 24 hrs, which accounts for about 505 observations in the duty time. The study also revealed that approx 10% of the stipulated duty time was spent on non production activities which is on the higher side. A logical and careful titration between the activities accounting for the Non productive part can proportionately increase the time available for productive patient care activities.
6. Clerical duties accounted for 13.6% i.e 79 observation out of 576 amounting to 3.26 hrs of the stipulated duty time which bring out the facts that a substantial part of the working hours (7.5%) is spent is carrying out documentation in respect of the patient care. Automation by improving the Hospital information System of the hospital can help reduce the burden of tedious documentation process in every part/ interface of the hospital.
7. The education activities were accounted 2.8% of total activities observed. It was quiet low & needs to be upgraded for a tertiary care hospital where training of paramedics is conducted regularly. The nursing staff in surgical ICU were assisted by trainee Medical assistant & trainee nurses. Training can be further improved by use of information technology in the hospital which is mandatory in view of the rapidly evolving Medical science and the pressure to keep pace with it.
8. From the Activity Sampling of the Nursing staff carried out, it was seen that all the staff devoted their maximum time in activities related to patient care. However, it is recommended that activities related to patient care can be further increased by reducing the time devoted to other Non-patient care activities like administrative, clerical and non-productive.
9. It is also recommended that to reduce the nonproductive activities carried out by the Nursing staff proper job identification and job distribution is a mandatory prerequisite so that maximum time can be made available and devoted for Patient care activities which will go a long way in improving patient satisfaction levels.

REFERENCES

1. Park K, Park's Textbook of preventive & social medicine, 19th edition, Year Feb 2007, M/s Banarsidas Bhanot, Jabalpur, Page-10.
2. World Health Organisation, year 1978, Health for All Serial Number 1.
3. NIHE Research report II: "Study of nursing & ancillary personnel in inpatient units of a hospital". New Delhi, 1976.
4. Gordon D. Rubenfeld, Resource allocation in the Intensive Care Unit, Chapter-252, Text Book of Critical Care, 5th edition, year 2005, Elsevier Saunders, Page: 2153-2155.

5. Directorate General of Health Services. "Hand Book of Health Statistics of India-1985. Govt of India Press, New Delhi.
6. Report of Committee to review conditions of Service, emoluments etc of Nursing Professionals (Shetty Committee)-1954, extract published in Indian Nursing Year Book 1983-1984, P, C-6.
7. Clinical, Diagnostic & Therapeutic Services, Indira Gandhi National Open University School of Health Sciences, PGDHHM-04, Jul 2005, Page: 16.
8. Putseps Ervin, Modern Hospital International Planning Practices, 1979, Page 362-361.
9. Clinical, Diagnostic & Therapeutic Services, Indira Gandhi National Open University School of Health Sciences, PGDHHM-04, Jul 2005, Page: 37.
10. Indian Standard of Basic Requirement For Hospital Planning, Part 2 up to 100 Bedded Hospital, IS 12433 (Part 2):2001, Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi, Page: 46.
11. Guidelines on Admission to and Discharge from Intensive Care and High Dependency Units, Table 1; para 7.1, Department of Health, March 1996.
12. Putseps Ervin, Modern Hospital International Planning Practices, 1979, Page 362-363.
13. Kanawaty G (ED). Introduction to Work Study. 4th ed. Geneva : International Labour Office 1992; 9, 19-20, 247-248.