

A Time-Motion Study to Assess the Workload of Nurses in Medical Units in a Selected Multispecialty Hospital at Kozhikode

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Abstract

A time-motion study was undertaken to find out the workload of nurses in medical units at a multispecialty hospital in Kozhikode (Kerala), and to assess the workload of nurses on direct and indirect patient care. A quantitative non-experimental approach with descriptive survey design was adopted with Von Bertalanffy's General System model as a framework. Data was collected from 45 nurses through simple random sampling using a personal data sheet, nursing care time motion chart and nursing care activity categorisation chart. Analysis revealed that nurses spent most the time (53.9%) on indirect patient care activities. Only 31.9 percent of the total mean was spent on direct patient care. Also, 14 percent of mean time was spent by nurses on just walking when performing different patient care activities. Maximum time was spent on documentation in the patient file (18.4%) and other patient care activities (18%). Nurses spent 12 percent of their mean time per day on medication administration; the same amount of time (9%) was spent by nurses on handover as well as system work. Also, four percent of time per day was spent on communication with the health care team. Only little time (3%) than provided (8%) was utilised by nurses as personal time. Nurses spent two percent of their time each on official phone calls, procedure preparation and article replacement..

Key words: Nurses' workload, Direct patient care, Indirect patient care

Nurses face many challenges at work due to the unclear job description and the excessive and unequal nursing workload. The lack of fair distribution of workload among nurses negatively affects the quality of patient care and their motivation level. The appropriateness of nursing workload is an important factor in ensuring the safety and quality of care for patients. This time limitation leads to ineffective training and supervision of new nursing staff (Moosazadeh et al, 2015). Therefore, conducting studies to analyse the workload of nurses is important. In a hospital setting, nurses almost always have a heavy workload, which in turn includes various direct and indirect patient care activities. So, exploring the workload of nurses would help to lay a foundation for planning and utilisation of nurses in medical units.

Time motion studies assess the workload of nurses. Such studies are gaining more importance in the discipline of nursing. Only few such studies have been conducted in the Indian scenario, where nurses struggle with the heavy workload.

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Need of the study: Nurses face many challenges due to the unclear job descriptions and excessive, and unequal workload which negatively affects the quality of patient care and their motivation level. Research also collaborates it (Griffith et al, 1999). A cross-sectional observational time and motion study was therefore undertaken in a selected multispecialty hospital at Kozhikode to assess the care and non-care-related activities among critical care nurses.

Objectives

The study was conducted to:

- Find out the workload of nurses in medical units,
- Identify the time spent by nurses for direct patient care in medical units, and
- Identify the time spent by nurses for indirect patient care in medical units.

Assumptions

- The workload of nurses includes direct and indirect patient care.
- Nurses may spend a large proportion of their work hours on indirect patient care.

- Indirect patient care may affect the time spent on direct patient care.

The theoretical framework was the general system model by Von Bertalanffy.

Review of Literature

As related to time-motion studies

Time-motion study may be used to assist in finding the most efficient method of doing work, and to assist in training individuals to understand the meaning of time-motion. Health personnel and hospital caregivers must be trained on efficient use of their time and energy with the accountability of interruptions and events (Weigl et al, 2009).

A study on hospital environment to assess how healthy personnel spend their time, in real-time and in real work contexts demonstrated that health personnel spent more than three-quarters of their time on clinical practice-related activities, but less than one-fifth of all health practice time was spent on activities defined as patient care activities. Three other activities accounted for the majority of outpatient practice time: documentation, care coordination, and medication administration. Only 7.2 percent (31 min) of clinical time was dedicated to patient assessment and recording of vital signs. Of all reported time, 6.6 percent (36.3 min) was categorised as waste (Chang et al, 2009).

A study was done to identify drivers of inefficiency in nursing work processes and nursing unit design. Three subcategories accounted for most of nursing practice: time documentation (35.3%; 147.5 min), medication administration (17.2%; 72 min), and care coordination (20.6%; 86 min). Patient care activities accounted for 19.3 percent (81 min) of nursing practice time, and only 7.2 percent (31 min) of nursing practice time was considered to be used for patient assessment and reading of vital signs (Kakushi et al, 2014).

A study on time allocation, direct patient contact, and simultaneous activities in hospital was carried out; an observation instrument for time-motion studies in hospital settings was developed and tested. Hospital physicians spent 25.5 percent of their time at work in direct contact with patients. Most time was allocated to documentation and conversation with colleagues and nursing staff. Physicians performed parallel simultaneous activities for 17-20 percent of their work time. Communication with patients, documentation, and conversation with colleagues and nursing staff were the most frequently observed simultaneous activities (Kakushi et al, 2014).

As related to the workload of nurses

Nursing workload definitely affects the time that a nurse can allot to various tasks. Under a heavy workload, nurses may not have sufficient time to perform tasks that can have a direct effect on patient safety. Heavy nursing workload can influence the care provider's decision to perform various procedures (Desjardins et al, 2008).

A descriptive/exploratory study on direct and indirect nursing care time in an intensive care unit was conducted at a private hospital. The nursing activities score classification system was used to estimate the direct care time, and electronic health records were used to estimate the indirect care time. The findings indicated that the average nursing care time was 29.5 hours, consisting of 27.4 hours of direct care and 2.1 hours of indirect care per patient/day (Yu et al, 2019).

An observation study performed to assess the workload of nurses showed that 58 percent of time was spent on indirect care activities of the patient. The most frequent activities/interventions of nurses were communication (44.1%), walking (24.3%) and documentation (15.8%).

Material and Method

The present study was a non-experimental quantitative one with a descriptive survey approach aimed to assess the workload of nurses in medical units of a selected multispeciality hospital in Kozhikode. The study subjects included 45 nurses selected through simple random sampling. The study was conducted in medical units of Baby Memorial Hospital, Kozhikode. The target population consisted of all nurses working in medical departments. The accessible population consisted of all nurses working in the medical departments of the selected multispeciality hospital at Kozhikode.

Data Collection Instruments

The tools used for the study were validated by experts and included:

Personal data sheet: A structured questionnaire prepared by the investigator consisted of nine questions to elicit background information such as age, gender, marital status, educational qualification in nursing, and experience in the concerned area of practice.

Nursing care time motion chart: This tool was prepared by the researcher to record the activities of the nurse being documented by the observer and consisted of recording start time, end time and total time of every activity.

Nursing care activity categorisation chart: The tool consisted of direct and indirect patient care categories prepared by the researcher.

Stopwatch: A calibrated stopwatch was planned as a tool to check the time taken for various activities by nurses.

Data Collection Process

After obtaining administrative permission and institutional ethical committee clearance, informed consent was taken from participants, and they were asked to fill out the personal data sheet. After explaining all the aspects of the study data was collected from each participant by direct observation, using the tools.

Results

Description of demographic characteristics of nurses

The mean age of the nurses was 27.3 years. The majority of nurses (97.8%) were females. More than half (55.60%) of nurses had the qualification of BSc Nursing, while 33.3 percent had a diploma in nursing. Only 11.1 percent had a post-basic BSc nursing qualification. Out of 45 nurses, three (6.7%) had an experience of less than one year, 19 (42.2%) had an experience of one to three years, 10 nurses (22.2%) had an experience of six years, and 13 nurses (28.9%) had experience of more than six years.

More than half of nurses (51.1%) had the opinion that all shifts had the same workload, while 26.7 of nurses had perceived that the morning shift had more workload. Also, 15.6 percent of nurses had the opinion that the night shift had more workload, while according to 6.7 percent thought that evening shift had more workload.

More than half of nurses (51.1%) had the opinion that there was no duplication in documentation, while the remaining 48.9% had the view that there was a duplication in the documentation. Majority of nurses (80%) viewed that workload affected their family life. Only 15 (33.3%) nurses were of the opinion that they get an adequate break during duty hours. More than half (57.8%) of the nurses could never leave duty on time.

Analysis of the workload of nurses

Table 1: Analysis of the workload of nurses during all shifts (N=45)

Activities of nurses	Mean time percentage			Total mean Percentage
	Morning shift	Evening shift	Night shift	
Direct patient care activities	30.96	32.39	32.35	31.9
Indirect patient care activities	55.48	56.18	47.63	53.09
Personal activities	1.6	2.03	1.59	1.76
Walking	11.9	9.4	18.43	13.25

Table 1 shows that the mean time spent by nurses for direct patient care during the morning shift was 30.96 percent, 32.39 percent in evening shift, and only 32.35 percent during night shift. During the morning shift 55.48 percent of meantime was spent for indirect patient care, 56.18 percent during the evening shift, and 47.63 percent for night shift. A notable finding was that on personal activities, nurses spent only 1.76 per cent of their mean time (morning shift 1.6%; evening shift 2.03%, and 1.59% for nurses in night shift).

The mean time spent by nurses on just walking was 11.9 minutes during the morning shift, 9.4 percent during the evening shift and 18.43 percent during the night shift.

Also, the total mean time percentage for direct patient care activities was only 31.9 percent while the mean time percentage for indirect patient care was 53.09 percent. Also, 1.76 percent of the time was spent as personal time. But 13.25 percent of the mean time was spent on walking showing that the nurses spent the most of their time on indirect patient care activities.

Thus, the analysis of the workload of nurses during all shifts revealed that the majority (53.09%) of time was spent by nurses on indirect patient care, while only a very minimal time (1.76%) was spent on personal activities. Also, 31.9 percent of the time was spent by nurses on direct patient care activities, which was almost the same in all shifts.

Table 2 shows that in a day maximum time was spent by nurses on documentation in the patient file (18.4%), which in fact took one-fourth of the mean time (25.2%) during the night shift and 17.7% per cent and 15.9 percent during the mean time during evening and morning shift, respectively. The same percentage of mean time (18%) was spent by nurses on other patient care activities during a day. It is ironic to note that 14 percent of the time per day were spent by nurses walking to do different patient activities. Also, 12 percent of the mean time per day was spent by nurses on medication administration.

The same amount of time (9%) was spent by nurses on handover and system work in a day. But in this maximum time for handover was spent during the evening shift (10.7%), and the maximum time for system work was spent during the morning shift (14.5%). Similarly, the same amount of time (4%) was spent by nurses in a day for learning activities as well as communication with the health care team; of these, maximum time was spent on learning activities during

Table 2: Activity-wise analysis of the workload of nurses (N= 45)

Activities of nurses	Mean percentage of time			Mean time percentage per day
	Morning shift	Evening shift	Night shift	
Medication administration	10	14.1	11.9	12
Teaching patients and family members	0.99	0.6	0.55	0.6
Other patient care activities	19.8	17.7	19.9	18
Handover	9	10.7	7.4	9
Coordinating care activities	4.8	5.8	1.9	4
Communication with the health care team	4.5	3.6	3.5	4
Official phone calls	2.5	1.8	2.2	2
Learning activities	1.6	7.9	0	4
Documentation in the patient file	15.9	17.7	25.2	18.4
Procedure preparation and article replacement	1.6	3.07	1.25	2
System work	14.5	7.3	6.14	9
Walking	12.8	11.3	18.56	14
Personal time	2.01	5.73	1.5	3

the evening shift (7.9%) and communication with the health care team during the morning shift (4.5%). Out of the allotted eight percent of personnel time, only three percent was utilised by nurses. Official phone calls, as well as procedure preparation and article replacement, took away two percent of the mean time per day. Out of it, the maximum time on official phone calls was spent during the morning shift (2.5%) and on procedure preparation and article replacement during the evening shift (3.07%).

Analysis of the time spent on different direct patient care activities by nurses

Table 3 shows that during all shifts maximum time in direct patient care activities was spent by nurses on patient care itself, maximum in the morning shift (61.91%) and least time being in the evening shift (54.05%). The second time-consuming activity of nurses among direct patient care activities in all shifts was medication administration. But it is to be noted that nurses spent very little time on educating patients and

Table 3: Distribution of direct patient care activities of nurses in all shifts (N= 45)

Direct patient care activities	Mean time percentage			Mean time percentage
	Morning shift	Evening shift	Night shift	
Medication administration	34.5	43.85	38.98	39.11
Teaching patients and family members	3.59	2.1	1.22	2.3
Other patient care activities	61.91	54.05	59.8	58.59

families in all shifts, the least time being in the night shift (1.22%) and the maximum mean time being in the morning shift (3.59%).

Analysis of the time spent on different indirect patient care activities by nurses

Table 4: Analysis of indirect care activities of nurses in all shifts (N=45)

Indirect patient care activities	Mean time percentage			Mean time percentage
	Morning shift	Evening shift	Night shift	
Handover	16.69	19.29	15.55	17
Coordinating care activities	5.03	10.65	4.3	5.6
Communication with the health care team	8.1	6.37	7.2	7
Official phone calls	4.88	3.29	4.7	4
Learning activities	3.47	13.6	0	8.5
Documentation in the patient file	33.01	31.17	52.7	38.9
Procedure preparation and article replacement	3.07	2.14	2.67	2
System work	25.75	13.49	12.88	17

Table 4 shows that the majority of time for indirect patient care was spent on documentation, out of which the maximum time was spent during the night shift (52.7%). System work took away one-fourth (25.75%) of the morning shift, while it took 13.49 percent and 12.88 percent in the evening and night shifts, respectively. Handover time was higher during the evening shift (19.29%) compared to the morning shift (16.69%) and night shift (15.55%). Similarly, the time for coordinating care activities was also more during the evening shift (10.65%). Almost the same amount of time was spent during the morning shift (8.1%), evening shift (6.37%), and night shift (7.2%), communicating with the health care team. Similarly, almost the same time was

spent during the morning shift (3.07%), evening shift (2.14%), and night shift (2.67%) for procedure preparation and article replacement as well as for official phone calls. Learning activities took 13.6 percent of evening shift time and 3.47 percent of morning shift time, while it was absent during the night shift.

Discussion

The study aimed to determine the amount of time nurses spent on specific direct and indirect nursing care activities and to identify the workload of nurses as such. This would help to make the most effective utilisation of available manpower.

An observational study on the workload of nurses revealed that 58 percent of the time was spent on indirect patient care activities, among which 15.8 percent of the time was for documentation, while 24.3 percent of the time was spent on walking, and 42 percent of the time was spent on direct care activities. Similarly, in the current study, the findings revealed that nurses spent 53.09 percent of their total time was spent for indirect patient care activities while 31.9 percent of the time on direct patient care activities, and 13.25 percent of the time on walking.

A study conducted to reorganise nursing work on surgical units revealed that nurses spent 32.8 percent of the time on direct patient care activities, 55.7 percent of the time on indirect patient care activities, and 2.5 percent of the time on personal time. Similarly, in the present study, nurses spent 31.9 percent of the time for direct patient care, 53.09 percent of the time for indirect patient care, and also 1.76 percent of the time as personal time.

In a study to assess the work pattern of neurology nurses in a Chinese hospital, 28.5 percent of the time was spent on communication and 28.3 percent on documentation. In contrast, in our study, nurses spent the most of their time (52.7%) on documentation and 7.2 percent on communication with health care professionals.

In an observation study to measure and analyse clinical nursing workload in an acute care hospital in Singapore, the most of the medical nurses' time was spent on documentation (18%) and medication administration (18%). Similarly, in the present study, 18.4 percent of the time was spent by nurses on documentation and 12 percent of the time on medication administration (Moosazadeh et al, 2015).

Recommendations

A similar study can be conducted (1) with a large number of subjects, (2) to prepare a patient

classification system, and (3) to identify the workload of nurses in supervisory roles. A comparative study can be carried out on the workload of nurses in intensive care units and wards.

Conclusion

Nurses spend the most of their time (53.9%) on indirect patient care activities, and only 31.9 percent on direct patient care activities. They spend 14 percent of their mean time on walking. In a day maximum time was spent by nurses on documentation in the patient file (18.4%), 18 percent on other patient care activities. They spend 12 percent of mean time per day on medication administration and 8 percent on handover and system work. Also, nurses spent four percent of their time daily on learning activities, as well as on communication with the health care team. Of the 8 percent of the time was allotted as personal time, nurses utilise only 3 percent. Official phone call, procedure preparation and article replacement took 2 percent of the mean nurses' time per day.

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