A study of the time utilization of administrative nurses in a large tertiary care teaching hospital in Northern India

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Research Article

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Abstract

Introduction

Nurses form the backbone of the health care system, and their role is vital in health care delivery in terms of promotion, prevention, treatment, care and rehabilitation. Nurse managers play a key role in the coordination of patient care and ensure quality nursing care. Apart from this, they also perform staff management, document administrative activities and supervise hospital substore activities. Efficient and effective nursing administration is essential for smooth hospital functioning and delivery of safe patient care. (2)

Methods

Study design: Observational

The estimation of time utilization by administrative nurses in different tasks was carried out in two phases. In the first phase, a questionnaire was developed for the self-reporting of various activities that were carried out by various administrative nurses. In the second phase, an activity sampling with a total of 316 hours of observations and 15,344 nursing activities was recorded across the hospital to estimate the actual time distribution and time utilization of administrative nurses.

Results

Administrative nurses spent a major portion of their time in store management (28%), staff management (23%), and documentation (21%) but much less time for patient care supervision and teaching activities, i.e., 4–8% of the total time available in a day.

Conclusion

The activity sampling study identified that administrative nurses spent most of their time in three major activities: store management, staff management and documentation. It may be emphasized to deliver more attention in patient care supervision and teaching.

Practitioner Points

> What is currently known about the subject matter

- Nursing can be described as both an art and a science; a heart and a mind.
- Efficient and effective nursing care is essential for smooth hospital functioning and delivery of safe patient care.
- Administrative nurses are nursing professionals who have knowledge of leadership practices and may refer to a number of management, supervisory and executive titles, viz. Nurse Manager, Nurse
Administrator or Nursing Supervisor

- Nurse managers play a key role in the coordination of patient care and ensuring its quality in addition to ward management activities such as the maintenance of stocks, communication with clinicians, and human resource management at the ward level.

What this paper adds

- Nurses perform different types of activities apart from ward management, viz. store management, documentation, and liasoning various activities
- Nurse managers spent a significant portion of their time in staff management (23%) and documentation (26%) but much less time in patient supervision and teaching activities (4–6%).
- The study showed that administrative nurses spent more time in store management and documentation.
- Activity sampling showed that the time for direct or indirect patient care, teaching and research activities was very low.

Implications of study findings for practitioners

- The actual time distributions of administrative nurses per task were different from the self-reported pattern of time allocation
- A complete time motion study is required to exactly quantify employees’ work distribution.
- The time for patient care supervision, teaching and research activities to be increased for better nursing administration in healthcare
- This study may be used to plan the staffing of nurses to deliver effective and efficient nursing care to the community.

Introduction

Nurses and doctors form the backbone of the health care system. They constitute two-thirds of the health workforce in India. Their central role in health care delivery in terms of promotion, prevention, treatment, care and rehabilitation is highly significant (1). Nursing can be described as both an art and a science; a heart and a mind. At its heart lies fundamental respect for human dignity and intuition for the patient’s needs. They are highly valued for specialized knowledge, care, skill in improving the health status of the public and ensuring safe, effective and quality medical care to the sick and needy.

Nursing administration is a broad term that encompasses nursing professionals who have knowledge of leadership practices. Nursing administration or leadership may refer to a number of management, supervisory and executive titles, including:

- Nurse Manager
- Nurse Administrator
Nurse managers play a key role in the coordination of patient care and ensuring its quality in addition to ward management activities such as the maintenance of stocks, communication with clinicians, and human resource management at the ward level. Efficient and effective nursing care is essential for smooth hospital functioning and delivery of safe patient care. Nurses perform different types of activities that can be grouped into basic nursing, technical care, ward administration and other activities. Nurse managers play a key role in the coordination of patient care and ensure quality nursing care. Apart from this, they also perform staff management, document administrative activities and supervise hospital substore activities. Taking all these factors into account, it is imperative to evaluate the utilization of administrative nurses in any hospital. This can also be used to plan the staffing of nurses to provide effective and efficient nursing care to the community.

Methodology

Study design: Observational

A prospective study was conducted on administrative nurses at the All India Institute of Medical Sciences for a period of two years from 2017 to May 2019. Data regarding the organization structure and job deployment of nurses working at the All India Institute of Medical Sciences were gathered from the Chief Nursing Officer and the NS and DNS offices of various centers. Interviews with nurses and reviews of records such as office orders, duty registers, assignment registers and other documents were performed to enumerate the managerial role. The estimation of time utilization by administrative nurses in different tasks was carried out in two phases. In the first phase, a questionnaire was developed by referring to the current job description of nurses in AIIMS hospital, the hospital manual for government hospitals developed by the Ministry of Health and Family Welfare, and taking inputs from different cadres of administrative nurses. There were 478 administrative nurses in AIIMS Hospital, New Delhi, and the sample size was calculated from this group using a sample size table. As per the referral table, the total sample size was calculated and was equally distributed among different centers as per the proportion of the administrative nurses deployed in these centers. According to the reference table, the recommended sample size for a population of 500, with a 95% confidence interval and a ± 5% margin of error, corresponded to 217, and the same number was distributed across different centers with respect to the proportion of sample size. A total of 246 responses were received from administrative nurses against the required sample size of 217.

After performing a detailed review of the literature, the sample size for the activity sampling was estimated using the formula $N = \frac{4pq}{d^2}$. 

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- Nursing Supervisor
- Director of Nursing
- Chief Nursing Officer (CNO)
where $N =$ sample size needed, $P =$ prevalence of the most common activities, $q = 1-p$, and $d =$ absolute error.

In the pilot study, it was found that the prevalence of administrative activity was approximately 25–30%; considering a 95% confidence level and an absolute error of 5%, the minimum sample size required for activity sampling was 300. As per a literature review of similar studies, 300 hours of observations was kept as the standard duration for the activity sampling. This duration was helpful for adequate representation of all tasks and was proportionally distributed among various cadres of administrative nurses across the hospital. As per the literature, observation of nurses by using activity sampling was made; observations were made at multiple intervals at a stretch of 2 hours in a single setting. At a time, the researcher observed 2–3 administrative nurses who were positioned nearby, and multiple tasks were recorded in a coded manner. The same activities were recorded as repeated activity after an interval of 10 minutes. A total of 316 hours of observation against the required sample size of 300 hours was made. Overall, 15,344 activities of administrative nurses were recorded during activity sampling across AIIMS.

**RESULTS**

Out of 4449 total nurses working in AIIMS hospital, the major population was junior nurses called ‘Nursing Officers’, who were approximately 82.66% in strength, and the next highest cadre was ‘Senior Nursing Officer’ (4.61%); these two categories looked after bedside patient care. A total of 7.62% of the nursing population were sister in-charges, and they mainly performed store management along with patient care supervision, documentation and management of subordinate staff. Assistant nursing superintendents (ANS) were 4.15% of the total strength, and they were the heads of patient care units, such as wards or ICUs. Chief nursing officers (CNOs), nursing superintendents (NSs) and deputy nursing superintendents (DNSs) contributed to 1% of the total nursing manpower of AIIMS Hospital, and they were responsible for human resource management, policy administration and research.

It was found that for every 13-bedside nurse, one in-charge sister was deployed. When the number of administrative nurses was correlated with the number of beds, it was also found that for every 82 beds, there was one DNS, such that there was one ANS for every 14 beds and one in-charge nurse for every 8 beds.

*Position for Table 1

**Table 1 Overall proportion of different categories of nurses in AIIMS**
<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategories</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bedside nurses</td>
<td>Nursing officer, Senior nursing officer</td>
<td>3691</td>
</tr>
<tr>
<td>2. Administrative nurses</td>
<td>Sister in-charge, Assistant nursing superintendent, Deputy nursing superintendent, Nursing superintendent, Chief nursing officer</td>
<td>478</td>
</tr>
<tr>
<td>3. Clinical coordinator nurses</td>
<td>Heart failure nurses, Wound care nurse, Breast clinic coordinator, Stoma care nurse</td>
<td>172</td>
</tr>
<tr>
<td>4. Managerial nurses</td>
<td>Nursing informative system, Infection control nurse</td>
<td>93</td>
</tr>
<tr>
<td>5. Clinico-Managerial nurses</td>
<td>Trauma nurse coordinator, Transplant coordinator</td>
<td>21</td>
</tr>
<tr>
<td>6. Health education nurse</td>
<td>Diabetic educator, Nursing educator, Eye bank nurse</td>
<td>14</td>
</tr>
<tr>
<td>7. Store management</td>
<td>Central linen facility nurse, OT store nurse</td>
<td>18</td>
</tr>
<tr>
<td>8. Diagnostic service nurses</td>
<td>In EMG, CT, TMT rooms etc.</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>4341</td>
</tr>
</tbody>
</table>
Table 2- Comparison of AIIMS nursing manpower against number of beds

<table>
<thead>
<tr>
<th>Category</th>
<th>AIIMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bed Nurse</td>
<td>1.7 nurses for every bed</td>
</tr>
<tr>
<td>2. Sister in-charge</td>
<td>1 in-charge for every 8 beds</td>
</tr>
<tr>
<td>3. Assistant Nursing Superintendent (A.N.S)</td>
<td>1 ANS for every 14 beds</td>
</tr>
<tr>
<td>4. Deputy Nursing Superintendent (D.N.S)</td>
<td>1 DNS for every 300 beds</td>
</tr>
<tr>
<td>5. Nursing Superintendent (NS)</td>
<td>1 NS for every 573 beds</td>
</tr>
<tr>
<td>6. Chief Nursing Officer (CNO)</td>
<td>1 C.N.O for 2290 beds</td>
</tr>
</tbody>
</table>

When comparing the currently available nursing manpower against the number of beds, it was found that AIIMS had 1.7 bed nurses for every bed, one sister in charge for every 8 beds and one ANS for every 14 beds.

**Results for Objective: 2**

The second objective was to estimate the current pattern of time utilization of administrative nurses. It was carried out in two phases.

I. **Self-reporting by administrative nurses.**

II. **Activity sampling**

The majority of in-charge nurses (30–40%) were appraised that they spend an average of 15 to 30 minutes per day on each task, which was asked in the questionnaire. The activities reported by them were patient care, store management, documentation and staff management. Approximately 30% of in-charge nurses reported that they spent more time in teaching activities, i.e., 30 to 60 minutes per day.

Assistant Nursing Superintendents (ANS) recorded their daily activities as follows: they take an average of 15 to 30 minutes per day for every activity, such as patient care, ward upkeeping, documentation and teaching activities. They also described that they spend more time, i.e., 30 minutes to 1 hour, on ward management and teaching activities.
In summary, administrative nurses reported that they spend more time on patient care supervision, general administration, staff management, store activities and teaching but less time on activities such as social and personal activities.

Table 3 shows the actual activities that were observed by the researcher; the major part of the time by the in-charge nurses was used for store activities, followed by documentation. It also depicts that they may spend much less time on patient supervision and teaching activities, but more time was consumed on nonproductive activities and idling. The major part of the time of ANS (Assistant Nursing Superintendent) was used for documentation, mainly for making and managing duty rosters. The next most common time-consuming activity was staff management. Again, they spent much less time on patient supervision and teaching activities, but more time was spent on nonproductive activities and idling.

<table>
<thead>
<tr>
<th>Administrative tasks</th>
<th>Sister In-charge</th>
<th>ANS</th>
<th>DNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Patient Care Activities</td>
<td>8%</td>
<td>6%</td>
<td>4%</td>
</tr>
<tr>
<td>2 Patient related communication</td>
<td>5%</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>3 General administration</td>
<td>6%</td>
<td>5%</td>
<td>12%</td>
</tr>
<tr>
<td>4 Documentation</td>
<td>16%</td>
<td>26%</td>
<td>26%</td>
</tr>
<tr>
<td>5 Up keep</td>
<td>6%</td>
<td>7%</td>
<td>2%</td>
</tr>
<tr>
<td>6 Staff Management</td>
<td>8%</td>
<td>23%</td>
<td>32%</td>
</tr>
<tr>
<td>7 Store &amp; Inventory Management</td>
<td>28%</td>
<td>3%</td>
<td>1%</td>
</tr>
<tr>
<td>8 Teaching</td>
<td>4%</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>9 Social personal needs</td>
<td>12%</td>
<td>11%</td>
<td>10%</td>
</tr>
<tr>
<td>10 Idling</td>
<td>7%</td>
<td>10%</td>
<td>8%</td>
</tr>
</tbody>
</table>

*Position for Table 3*

In the case of DNS & NS, they spent more time on staff management and documentation, mainly for leave management, i.e., receiving, verifying and sanctioning different kinds of leave applications that were put up by nursing staff. However, again, these higher cadre nurses also spent much less time on patient supervision and teaching activities, but more time was spent on nonproductive activities and idling.

* position for Fig. 1 to show the comparative differences in time utilization

**Discussion**
The deployment of nurses in different patient care and administrative cadres was assessed. Nursing at AIIMS hospital is a centralized professional cadre in terms of recruitment and other policies. During the study period, there were 4449 nurses employed in the institution to care for the patients reporting to this hospital and its specialty centers. Among them, 841 nurses were of cadre grade I, and 3438 were of cadre grade II. In the present study, 478 administrative nurses from five major centers of the institute were studied: Main Hospital, the Cardio-Nuero Centre, Dr. RP Centre for Ophthalmic Sciences, JPNA Trauma Centre and Dr. BRA Institute of Rotary Cancer Centre. While the government staff norms, the Staff Inspection Unit (S.I.U.) recommends one staff nurse for every six beds, AIIMS had 1.7 nurses for every bed. However, in the case of higher level administrative nurses, AIIMS had a shortage of Nursing Superintendent and Chief Nursing Officer against the standard norms. In the present study, nearly 61% of the study population was an in-charge sister (Sister grade 1HR), 30% was an ANS, 6% was a DNS and NS was 1.5% of the total population.

**Self-reporting** by administrative nurses regarding their time distribution was evaluated by a self-administered questionnaire that was distributed among all cadres of administrative nurses working in different centers of AIIMS. The time allocation (mean value) by administrative nurses in each and every managerial task was calculated, and it was found that sister in-charge spent more time in i) store and inventory management, which requires at least 90 minutes per day, i.e., approximately 19% of daily nursing time. ii) Patient care supervision, which contributes to 17% of the total time (80 minutes in a day), and iii) teaching activities, which consume 14% of the daily time (69 minutes). In the case of Assistant Nursing Superintendent (ANS), the time distribution was as follows; the major time-consuming activities were i) general administration and staff management, both of which consume approximately 80 minutes per day, i.e., approximately 17% of the total duty hours in a day. Patient care activities consumed 70 minutes, i.e., 15% of the total time.

**Work sampling or activity sampling** studies have been performed to evaluate the real-time distribution of different administrative tasks, such as patient care supervision, patient-related activities, store management, general administration, and teaching. In self-reporting, the administrative nurses reported that they were spending more time in patient care, general administration and teaching. However, during observation/activity sampling, it was found that the actual time spent in patient care and teaching was much less than that spent in staff management and documentation.

Sister in-charges expended their major portion of time in store management (28%) and documentation (16%) but spent much less time on patient care supervision and teaching activities (4–8% of total available duty time in a day). ANS spent a significant portion of its time in staff management (23%) and documentation (26%) but much less time in patient care supervision and teaching activities (4–6%). DNS also follows the same pattern as ANS, i.e., 25–30% of time for staff management and documentation but negligible time in patient care supervision and academic or teaching activities. The managerial nurses spent a high amount of time on nonproductive activities and idling (12–20%)
The actual time distribution was different from the self-reported pattern of time allocation. It was apparent that the foremost portion of time in the case of Sister in-charge nurses was spent in store management and documentation, while in the case of ANS and DNS, it was spent in staff management and documentation. In every observation, the time for direct or indirect patient care, teaching and research activities was very low.

A time and motion study conducted with nurse managers in South Africa (2015) stated that nursing unit managers spent approximately 26% of their time on direct patient care, 16% on hospital administration, 14% on patient management, 4% on teaching, 13.4% on support and communication, 4% on managing stock and equipment, 11.5% on staff management, and 12% on miscellaneous activities (3).

A comparable study in a medical ward in Australia (2008) found that nurses spent 33% of their time in direct patient care (4), while another Australian study in two wards of a teaching hospital found that nurses spent 37% of their time with patients (5). Similarly, a Belgian study found that nurses spent 32.2% of their time on direct patient care (6), while a similar proportion of 32.8% was found in a Montreal hospital study among surgical nurses.

In the present study, administrative nurses were not doing any direct patient care as observed in the studies conducted outside, but the time distribution in staff management and teaching of the South African study was correlated with the observations of the current study. The time allocation for store and inventory management in this study was very high (25–30%) when compared to the results shown in the South African study (4).

**Limitations**

An observational study of administrative nurses provides an overview of activities executed by administrative nurses, but it may not reflect every activity undertaken, nor does it identify the proportion of time spent undertaking more than one activity at a time. Occasionally, when a nurse was undertaking two or more tasks at once, it was difficult to distinguish the primary activity, and clarification was needed. Second, the activity sampling technique used was direct observation; however, it was always possible that those being observed changed their behavior because of the study. The same nurses were observed multiple times per observation period and were also observed multiple times during data collection. Classic inferential statistics could not be used to rule out chance as a reason for the observed differences.

**Conclusion**

Nurses are the backbone of any healthcare organization, and it is thus imperative to evaluate their professional performance. In self-reporting, the administrative nurses reported that they spent more time on patient care supervision, general administration, staff management, store activities and teaching but negligible time on nonproductive activities such as social and personal needs. However, the actual time
allocation was different from the self-reported pattern of time distribution. It was apparent from the activity sampling that a major portion of the time was spent by Sister in-charge nurses in store management and documentation, while in the case of ANS and DNS, it was staff management and documentation. In every observation, the time for direct or indirect patient care and teaching and research activities was very low. It may be emphasized to deliver more attention in patient care supervision and teaching.

**Abbreviations**

1. AIIMS - All India Institute of Medical Sciences
2. ANS - Assistant Nursing Superintendent
3. CNO - Chief Nursing Officer
4. DNS - Deputy Nursing Superintendent
5. NS - Nursing Superintendent
6. ICU - Intensive Care Unit
7. MHA - Master of Hospital Administration
8. MBBS - Bachelor of Medicine, Bachelor of Surgery
9. MDHA - Master of Dental Health Administration
10. HR - Human Resources

**Declarations**

1. **Ethics Approval and Consent to Participate:** Ethical approval for this study titled "A Study of Time Utilization of Administrative Nurses in a Large Tertiary Care Teaching Hospital in North India" was obtained from the AIIMS Institute Ethics Committee. The approval reference number is [IECPG/319/6/2017].

2. **Consent for Publication:** All participants involved in this study provided their informed consent for the publication of the study's findings while ensuring their anonymity and confidentiality.

3. **Availability of Data and Materials:** The data supporting the findings of this study are available in the Ethics Committee repository of AIIMS New Delhi, accessible at [http://14.139.245.45:8082/iecaiims/Pages/CompletedProjectHistory4Inv.aspx], with the reference number [IECPG/319/6/2017]. Further data and materials can be obtained from the Ethics Committee upon reasonable request.

4. **Competing Interests:** The authors declare no competing interests in relation to this study.

5. **Funding:** This research study received no external funding.

6. **Authors’ Contributions:**
7. Acknowledgments: The authors would like to express their gratitude to the AIIMS Institute Ethics Committee for their support and approval of this study.

References


Figures
Figure 1 shows the comparative differences in time utilization between self-reporting and activity sampling: by Sister In-charge and ANS & DNS.