Time and Motion Study of Nurses Activities in Nanavati Super Speciality Hospital, Mumbai

By

Anushri Desai

Dissertation submitted in partial fulfillment of the requirements of the degree

MBA Hospital and Health Management

Academic year, 2017-2019

The IIHMR University, Jaipur

1, Prabhu Dayal Marg, Sanganer, Airport
Jaipur 302029, Rajasthan
Ph: 0141 3924700, Fax: 3924738
Website: **www.iihmr.edu.in**

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INSTITUTE OF HEALTH MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Dr. Anushri Desai student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at iCare Learning Private Limited, Mumbai from 04 Feb 2019 to 04 May 2019

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfilment of the course requirements.

I wish her all the success in all ~~his~~ her future endeavours.

Col. (Dr) Ashok Kaushik
Dean Academics and Student Affairs
The IIHMR University, Jaipur

15 May 2019

Dr. Nutan P. Jain
Professor
The IIHMR University,
Jaipur

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04-May-2019

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Dr. Anushri Desai, a MBA student of Hospital and Health Management from Indian Institute of Health Management Research (IIHMR), Jaipur has successfully completed her internship of three months in our iCare Learning Private Limited, Mumbai. Her internship tenure was from 4th February,2019 to 4th May,2019.

She was working in Dr. Balbhai Nanavati Super Speciality Hospital on a project "Time and Motion study of nurses activity". She was also actively and diligently involved in the projects and tasks assigned to her in iCare Learning Private Limited.

During her internship tenure with us, we found her extremely inquisitive, punctual and hardworking. She was very keen to understand functions of our core business and has put in her best efforts to get into the depth of the subjects assigned to her.

Dr. Desai has excellent interpersonal skills and is very good at communicating with people at all levels.

Her association with us was very fruitful and we wish her a bright future.

Sincerely,

Suresh R Shastry
MD & CEO

iCare Learning Pvt. Ltd.
Registered Office: B-12 A, Wadala Udyog Bhavan, Naigaon Cross Road. Wadala. Mumbai, Maharashtra 400 031
Toll Free: 1 800 103 1918. Email: contact.in@icare.life website: www.icare.life
CIN: U80903MH2012PTC229413

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation project is done and submitted by Dr. Anushri Desai Enrolment No. 540 under the supervision of Dr. Nutan P. Jain, Professor, The IIHMR University for award of MBA in Hospital and Health of the University carried out during the period from 04 Feb 2019 to 04 May 2019 embodies my original work and has not formed the basis for the award of any degree, diploma associateship, fellowship, titles in this or any other institute or other similar institution of higher learning.

Signature

Dr. Anushri Desai

Abstract

TIME AND MOTION STUDY OF NURSES ACTIVITIES IN NANAVATI SUPER SPECIALITY HOSPITAL, MUMBAI

Author: Anushri Desai

Background.

In order to maintain efficiency and optimize the use of resources it is necessary to balance the number of nursing staff in comparison to the number of patients. One of the possible ways to achieve efficiency is workload management. A time and motion study is a workload management method to determine how nurses spend their time to accomplish various activities.

Objectives

The objectives of the study are: (i) to study daily routine of nursing staff by time spent on each of the activities during their working hours from entry to exit; (ii) to find out appropriateness of time spent on each activity with reference to guidelines of the hospital, and (iii) to suggest ways to remove any gaps in time if present with reference to the hospital guidelines.

Methodology

The study is descriptive in nature. The study was conducted at Nanavati Super speciality hospital, Mumbai during February – April, 2019. A total of 45 nurses were contacted but 15 did not consent and therefore, 30 nurses were observed during morning shift in four wards: three general wards one special ward Sister In-charge and Team leader were excluded.

Results

The highest amount of mean time is spent in Transit (50 minutes) over standard of 15 minutes. The second highest amount of time is spent on documentation (134 minutes) over standard 120 minutes. There is less time devoted to Direct patient care (123 minutes) over standard 150 minutes and Indirect patient care which is 69 minutes over standard of 75 minutes. The data shows normal distribution with no outliers.

Conclusion

One-tenth of time was spent on transit which can be managed by prior communication and coordination with the other points of care over telephone. E-documentation may help in reducing time and may give scope to increase direct and indirect patient care. Trained assistants may be prepared for some activities which can be done by them after adequate training

Key Words: Time and motion, direct patient care, appropriateness

Acknowledgements

The internship at iCare Learning Private Limited, Mumbai has helped me in understanding the working of a home healthcare care organisation and training centre.

Firstly, I would like to thank Mr. Suresh Shastry, MD and CEO for providing me excellent opportunity to do my dissertation at iCare Learning Private Limited, Mumbai

I also want to extend my thanks to Dr. S.D Gupta, Director-IIHMR for instilling right attitude towards learning and Col. (Dr.) Ashok Kaushik, Dean-Academic and Students Affairs, IIHMR, for helping and supporting me to fulfil my goals.

I extend my sincere thanks to my respected mentor of The IIHMR University Dr. Nutan Prabha Jain, Professor for her constant help and support and invaluable time-to-time guidance in completion of this project.

Finally, I acknowledge my indebtedness to the staff of iCare Learning Private Limited and Dr. Balabhai Nanavati Super Speciality Hospital for providing constant support by guiding me throughout my training period.

Sincerely,

Dr. Anushri Arun Desai

MBA-HM (2017-2019), Roll No - 0540

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List of Abbreviations

Abbreviation	Expansion
GDA	General Duty Assistant
TAT	Turnaround time
PC	Personal Computer
OT	Operation Theatre

TIME AND MOTION STUDY OF NURSES ACTIVITIES IN NANAVATI SUPER SPECIALITY HOSPITAL, MUMBAI

Nurses are the primary caregivers in a hospital. Hence, the efficiency and effectiveness of their work directly impacts the quality of care provided to the patients. These frontline caregivers present a critical and costly resource. A growing evidence base links more nursing time per patient-day with better patient outcomes. However, increased nurse workload and the growing nursing workforce shortage reduce the amount of nursing time available for patient care activities. Their knowledge, clinical judgement, skills, attitude, communication, compassion and empathy can make a phenomenal difference in patient care. In order to maintain efficiency and optimize the use of resources it is necessary to balance the number of nursing staff in comparison to the number of patients. It is possible to achieve this through workload management method. A time and motion study is a workload management method that is used to determine how nurses spend their time across various activities. It can be used to relate patient characteristics and can be used to predict nurse workload.

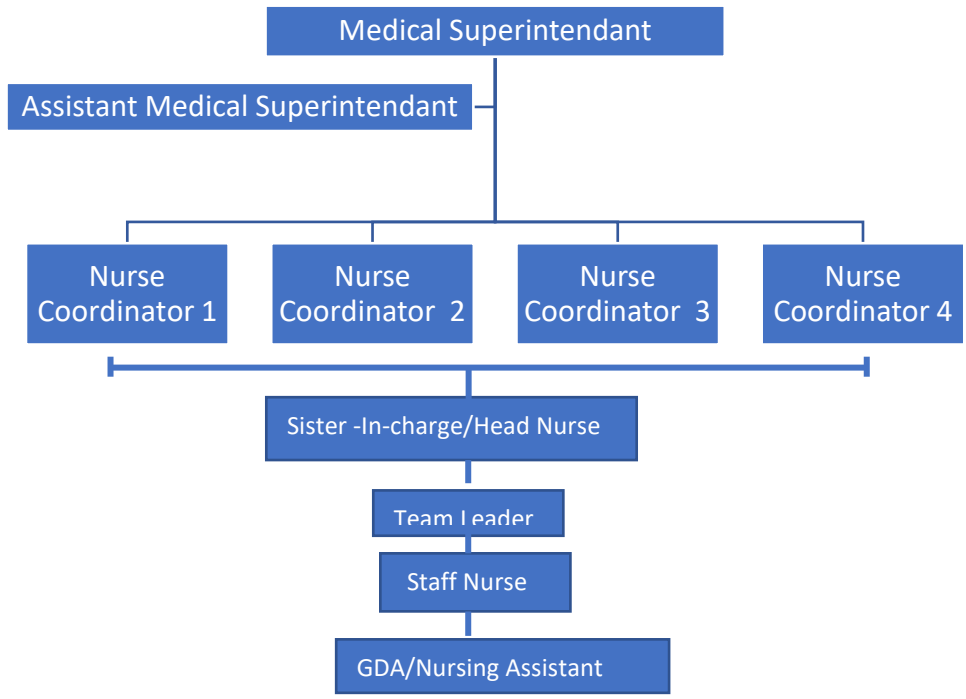
The current study was conducted in Nanavati Super Speciality Hospital.Nanavati Super Speciality Hospital is a 350 bedded hospital with over 350 consultants and 55 specialty departments, 100 resident doctors, 600 nursing staff and 1500 employees. Nanavati is NABH, NABL and NABH Nursing excellence accredited hospital.

Overview of the Nursing Department in Nanavati Super Speciality Hospital

The Department of Nursing at Nanavati Super Speciality Hospital is awarded with Nursing Excellence (NABH), a recognition of high-quality nursing care. The nursing department is headed by the Medical Superintendent who supervises the entire functioning of the department. She/ He reports to the Chief Operating Officer.

Nursing Department leadership team:

The department leadership team in Nanavati Super Speciality Hospital is as follows-



The activities performed at each level is different and they have different share of responsibilities.

Activities performed by Staff nurse-

Staff nurse is responsible to provide patient care and is engaged in various clinical and non-clinical activities. In this study, staff nurses are the study respondents and thus the daily routine of nurses was studied. The daily activities performed by them are as follows-

- Nurses arrive at the nursing station and mark their attendance,
- Look for their respective assignments,
- Takeover,
- Start with providing medications to the assigned patients and document it,
- Take patient vitals,
- Accompany the consultants when they arrive for rounds,
- Answer patient call bells if it is for them on request of nursing assistant,
- Enter chargeable expenses in the PC or ask someone /senior to do it,
- Take inventory from pharmacy etc.
- Accompany patient to OT or any other department for diagnostic tests or procedures,
- Document every task done,
- Answer phone calls,
- Give Handover,
- Change and leave

Activities performed by Team leader

Team leader documents care services provided by every nurse in the communication book, handover to the Team leader in the next shift, attend to the assigned patient and supervises the activities performed by the staff nurses.

Activities performed by Head nurse

Head nurse coordinates all the activities, assigns leaves and manages inventory and attendance, handles any complaints of the patient/nurses

Activities performed by the Nursing Assistant

Nursing assistant answers patient call bells and reports to the sister in charge

Activities performed by Nurse Co-ordinator

Nurse co-ordinator is responsible for taking daily rounds of the patients along with sister in charge.

All the nurses in the department work as a team and are responsible for delivering best services to the patient.

Nurses in the wards work in nurse patient ratio of 1:5.

The nurses in the department took few breaks and the general observations found were-

Few nurses especially the junior nurses lacked confidence, also nurses were hesitant to attend consultant rounds of patients who are not their own assignments and wait for the nurse assigned to a particular patient to be free so that she could attend.

At times, Sister in charge lose her temper and did shout on the nurses. The mistake was of the nurses but shouting could have been avoided to maintain the working environment.

Lack of Communication between nurses and AMO was observed on few occasions. AMO do not mention things in the patient file.

Many a times hand washing was not done after insulin injections

Incomplete documentation in patient file was observed.

About Time Motion Study

Nurses in Nanavati Super Speciality hospital work in three shifts. Morning Shift (7 am to 3 pm), Evening Shift (2 pm to 10 pm) and Night Shift (10 pm to 8 am). In order to maintain efficiency and optimize the use of resources it is necessary to balance the number of nursing staff in comparison to the number of patients. It is possible to achieve this through workload management method. A time and motion study is a workload management method that is used to determine how nurses spend their time across various activities. It can be used to relate patient characteristics and can be beneficial to predict nurse workload. In this study the nurses worked in Nurse patient ration of 1:5. They were engaged in various clinical and non-clinical activities.

Rationale:

Maintaining the standards and continuous improvement in the quality of the care provided to the patient is what the Nanavati Super Speciality Hospital seeks for. In order to maintain the desired standards, the hospital has always taken the necessary steps that can further improve the efficiency. The suggested study aims to determine the actual time spent on various activities from entry to exit and how much it varies if it does from the desired standard time so that steps can be taken to reduce inefficiencies and further enhance the functioning of the department.

Literature review

Title	Authors	Objectives	Key findings
A Time-Motion Study of Registered Nurses' Workflow in Intensive Care Unit Remote Monitoring	Zhihua Tang, Janine Mazabob, Liza Weavind, Eric Thomas and Todd R. Johnson 2006	To survey nurses' tasks in new critical care setting. To investigate the impact of the enabling technology on nurses' workflow.	The results showed that nurses essential tasks were centered on three themes: monitoring patients, maintaining patient's health records, and managing technology use. In monitoring patients, nurses spent 52% of the time assimilating information embedded in a clinical information system and 15% on monitoring live vitals.
Care and noncare-related activities among critical care nurses: A cross-sectional observational time and motion study	Maryam Ahmadishad, Mohsen Adib-Hajbaghery, Mahboubeh Rezaei, Fatemeh Atoof, Esther Munyisia. December 9 ,2018	To measure care and noncare-related activities among critical care nurses and to determine their contributing factors.	The duration of nurses' care-related activities (249.10 ± 65.00 min, i.e., 69.2% of a 6-h shift) was significantly more than the duration of their noncare-related activities (111.00 ± 48.30 min, i.e., 30.8% of a 6-h shift). Respecting care-related activities, participants spent 53.5% of their time on direct care and the rest 46.5% on indirect care; whereas respecting noncare-related activities, they spent 76.5% of their time on personal activities (such as making personal calls) and the rest 23.5% on

			unit related tasks. The duration of nurses' activities had significant relationships with their unit, nurse–patient ratio, and patients' age, gender, and diagnosis.

Research Questions:

How do nurses distribute their time across various activities during their working hours from entry to exit?

Objectives:

- To study daily routine of nursing staff by time spent on each of the activities during their working hours from entry to exit
- To find out appropriateness of time spent on each activity with reference to guidelines of the hospital
- To suggest ways to remove any gaps in time if present with reference to the hospital guidelines.

Operational definitions

Time-motion study is a quantitative data collection method where an external observer captures detailed data on the duration and movements required to accomplish a specific activity, coupled with an analysis focused on improving efficiency.

Task and information tool definitions-

Table 1: Operational definitions of various nurses activities

Direct Patient Care	Activities involved in Direct patient care include administration of medicines, sponging, applying dressings, taking vitals, other nursing procedures, assisting consultants in rounds, attending to patient call bells
Indirect Patient Care	All tasks associated with inventory check (checking of dressing trolley inventory, patient fridge medication, general, consumable and medicine inventory, crash cart, IV Caddy inventory), time spent in medicine preparation, taking medicines from the store, removing medicines from shelves.
Documentation	Documentation of medication, nursing notes and nursing plan and daily assessment documentation.

Communication	Time spent in Communication with other staff (doctor, nurse, housekeeping, receptionist, assistant)
In Transit	Time spent in walking from patient room to nursing station and time spent in accompanying the patient to OT, time spent by nurses in transferring patient to another ward/ICU etc
Technology use	Chargeable expense documentation in the system, medicine requirement indent
Handover and Takeover time	It includes the exchange of patient disease information and treatment administered to the patient in one shift. Handover is given to nurse of next shift and take over is taken from the nurse of the previous shift.
Personal time	All non-work communication, e.g. meal/tea breaks, personal calls
Other	Any other activity not included above. e.g., time spent in searching patient files etc.

Methodology

Study Design: The study design was Observational Descriptive.

Descriptive study was done as the existing situation of the time spent on various nursing activities was studied and the study had no predetermined hypothesis and no hypothesis testing was done.

Observational study was conducted as the nurses were observed in their shifts for 8 hours and Descriptive study

Study Respondents and Sample Size: Staff nurses from 1 Special ward and 3 general wards

Wards	Total staff nurses in one shift in a day	Total staff nurses in three shifts in a day	#Nurses observed
Special ward (1)	6	18	21*
General wards (3)	9(3)	27(9)	9
Study population		45	30

**Three nurses were deputed from other wards*

The study respondents were staff nurses from four wards. The four wards were three general wards (18 bed each) with three staff nurses in one shift and one Special Ward (40 bedded) with six staff nurses in one shift. These four wards were the ones with the majority of patient complaints. Total nurses from 3 general wards were 27 and total nurses from special ward were 18. Total study respondents were 45. Sample size was 30 i.e. 21 staff nurses in special ward and 9 staff nurses in General ward. Three nurses were deputed from other wards.

Inclusion Criteria

Staff nurses in the shift of 7 am to 3 pm present in the ward on the day of the study and who were willing to participate were included in the study.

Exclusion Criteria

Sister In-charge and Team leader were excluded as their work involves monitoring staff nurses and other ward activities, newly joined employees with experience of 0 -6 months were excluded from the study as they were not fully oriented to the ward activities, those nurses who did not give consent were not included in the study

Data collection tools

Data collection Checklist was used to collect information.
It included the various activities performed by the nurses and the time taken to complete each activity was recorded with the help of checklist.
The following are the various categories and subcategories of activities performed by each nurse from entry to exit.

Indirect Patient Care that includes inventory check, medicine preparation, taking medicines from a store and removing medicines from shelves, checking for replacements etc.,

Direct Patient Care that provides for medicines administration, checking patient vitals, assisting consultants in rounds, and other nursing procedures,

Communication with co- staff (doctor, nurse, housekeeping, receptionist, assistant) and answering phone calls,

Technology use (Chargeable expense documentation in the computer system, medicine requirement indent),

Documentation (Documentation of medication, nursing notes and nursing plan and daily assessment documentation),

Transit **(**walking from patient room to nursing station and time spent in accompanying the patient to OT, transferring patient to another ward/ICU etc.),

Takeover - from the nurse of the previous shift

Personal time (All non-work communication, e.g. meal/tea breaks, personal calls), Handover to next shift staff and over to Team Leader, and Searching for patient file /other

Data Analysis

Data was tested for normality by doing the following analysis-

Average, Standard Deviation, Minimum, Maximum value and range was calculated and Z test was done. Outliers in the were checked by doing the following. Z test was done to check for normality and if no value greater than 2.68 or less than 2.68 was found then it suggested that the findings followed normality.The outliers were checked by the following formula-

Upper bound= Quartile 3 + (1.5 Inter Quartile range)*

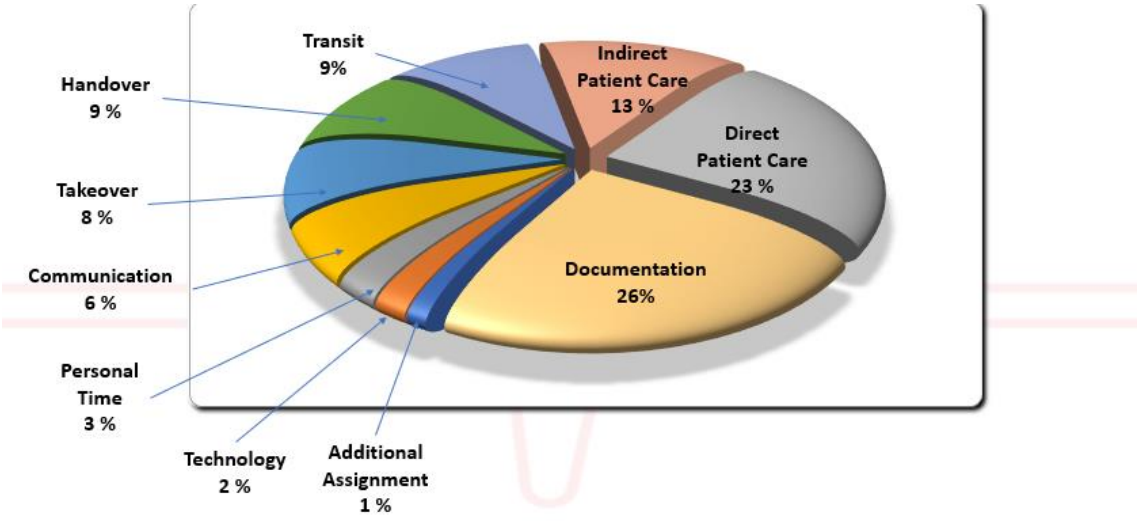
Lower bound= Quartile 1- (1.5 Inter Quartile range)*

There was no finding above upper bound i.e. 27.62 and no value below -5.37 which suggested that the entire data is normally distributed

Results

After the data analysis, the percentage distribution of nurses time across various activities performed by them was done to find out the time taken for each activity

Fig: 1 Percentage distribution of nurses time by various activities



Documentation (26%) consumes the maximum amount of time followed by Direct (23%) and Indirect patient care (13%) Transit and handover consumes 9 % followed by takeover 8%. Communication consumes 6%, Personal time 3%, technology 2% and additional assignment if taken any consumes 1%.

Indirect Patient Care (13%) included subcategories like inventory check that consumed 6 % of the total time taken for documentation. Medicine Preparation consumed 3%, taking

medicines from store consumed 2 % and removing medicines from shelves consumed 1%.

Direct patient care (23%) included subcategories like Medication administration (8%), Recording Patient vitals (5%), Assisting consultants in rounds (3%), Giving saline 2(%), Recording height and weight (3%), Sponging (1%), Putting IV (2%)

Communication (6%) included subcategories that involved communication with the doctor that consumed 2 % of the total time, Nurse involved 1 %, Assistant 1 %, Housekeeping 1%, Answering phone calls 1%.

Fig: 2 Standard vs actual time taken by activities

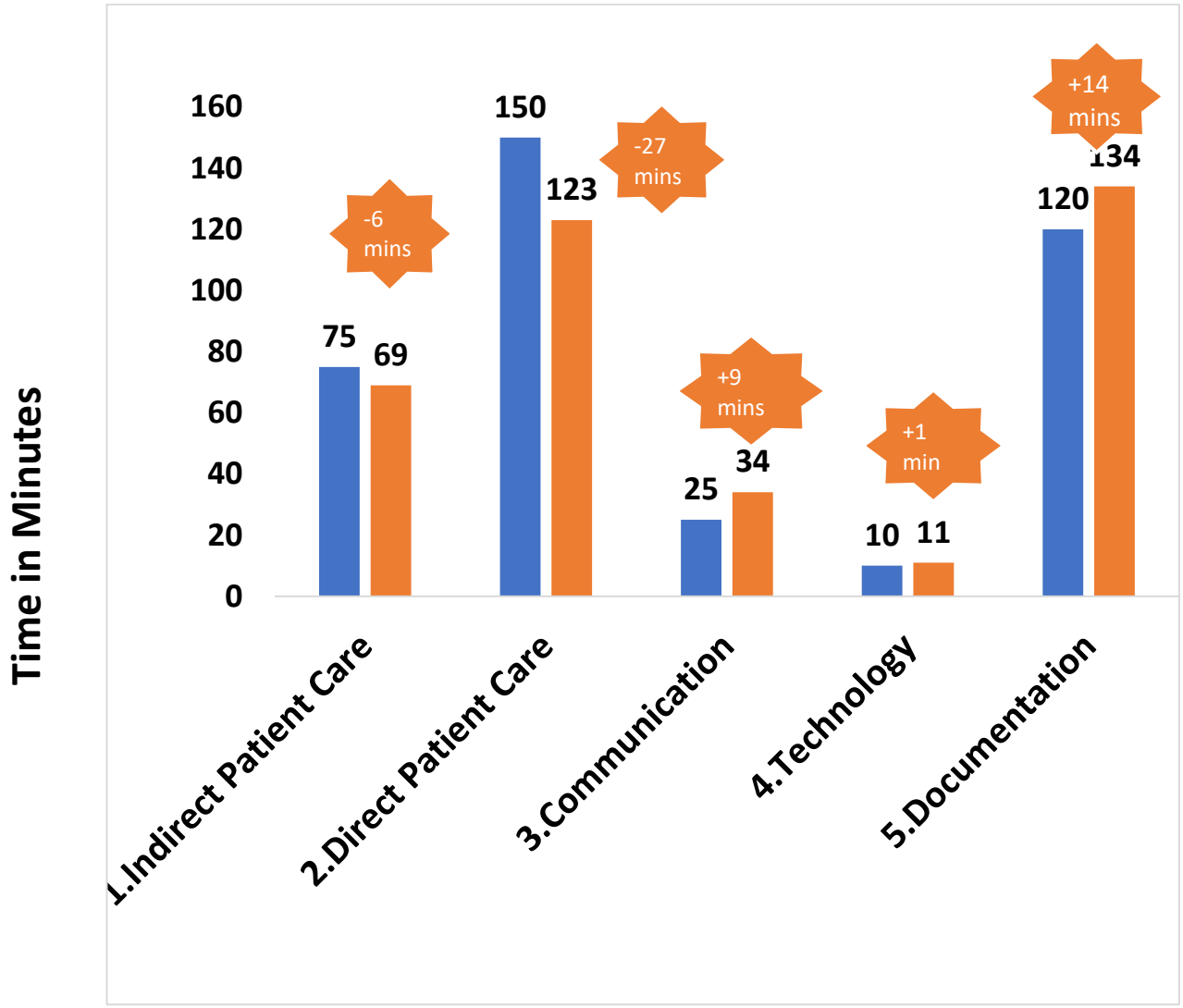


Figure 2 depicts less time is devoted to Indirect patient care by 6 minutes.27 minutes less is provided to direct patient care when compared to standards as per

guidelines of the hospital. More time is devoted to communication (more 9 minutes) and documentation (more 14 minutes) when compared to standards

Indirect patient care is consuming 75 minutes when compared to standard 69 minutes which means it is consuming 6 minutes less than the standard.

Direct patient care is consuming 150 minutes when compared to standard 123 minutes which means it is consuming 23 minutes less than the standard.

Communication is consuming 34 minutes when compared to standard 25 minutes which means it is consuming 9 minutes more than the standard.

Usage of Technology is consuming 11 minutes when compared to standard 10 minutes which means it is consuming 1 minute more than the standard.

Documentation is consuming 134 minutes when compared to standard 120 minutes which means it is consuming 14 minutes more than the standard.

Fig: 3 Standard Vs Actual time taken by activities

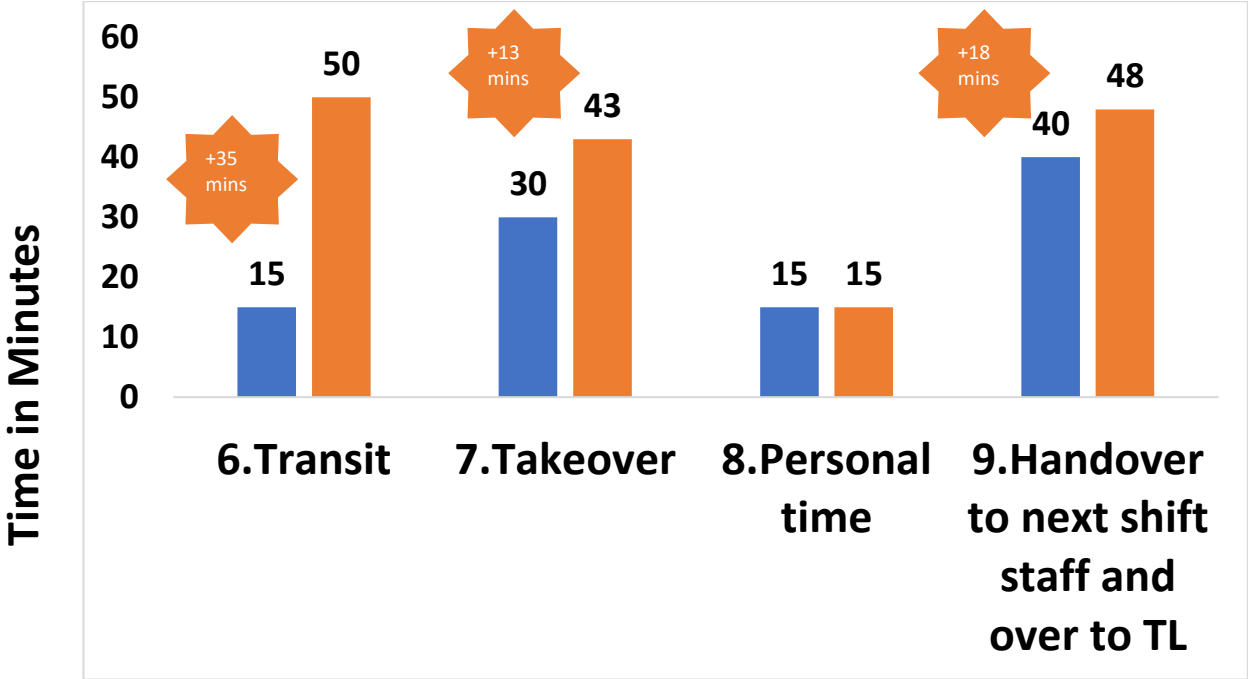


Figure 3 depicts more 35 minutes time is devoted in Transit.13 minutes more is consumed in takeover when compared to standards as per guidelines of the hospital. More time is devoted to handover (more 8 minutes) when compared to standards.

It also depicts that Transit is consuming 50 minutes when compared to standard 15 minutes which means it is consuming 35 minutes more than the standard.

Takeover is consuming 43 minutes when compared to standard 30 minutes which means it is consuming 13 minutes more than the standard.

Taking another nurse's staff assignment is consuming 7 minutes of time which is not there in the standard.

Handover to next shift staff and over to Team leader is consuming 48 minutes when compared to standard 40 minutes which means it is consuming 8 minutes more than the standard.

Fig: 4 Shortage or less time spent in activities (in minutes)

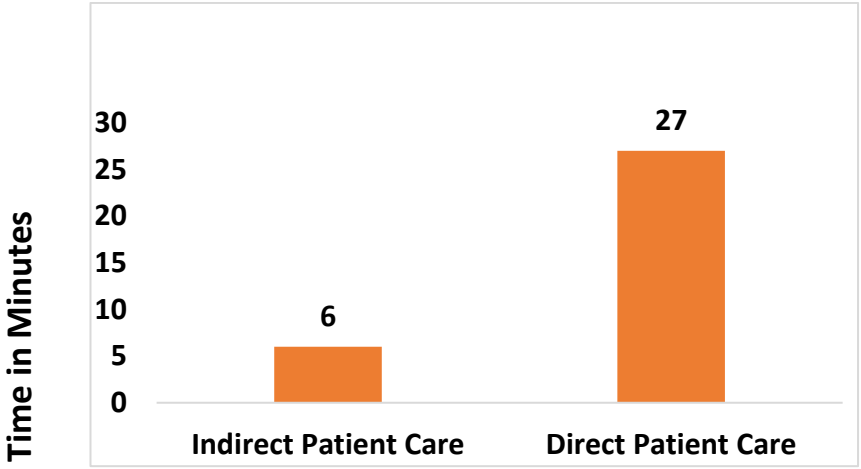


Figure 4 depicts 6 minutes less devoted to Indirect patient care and 27 minutes less devoted to direct patient care.

The Figure 4 depicts the shortage of time devoted to activities when compared to standards. Indirect patient care is consuming 75 minutes when compared to standard 69 minutes which means it is consuming 6 minutes less than the standard.

Direct patient care is consuming 150 minutes when compared to standard 123 minutes which means it is consuming 23 minutes less than the standard.

Fig: 5 Excess time spent in various activities when compared to standards

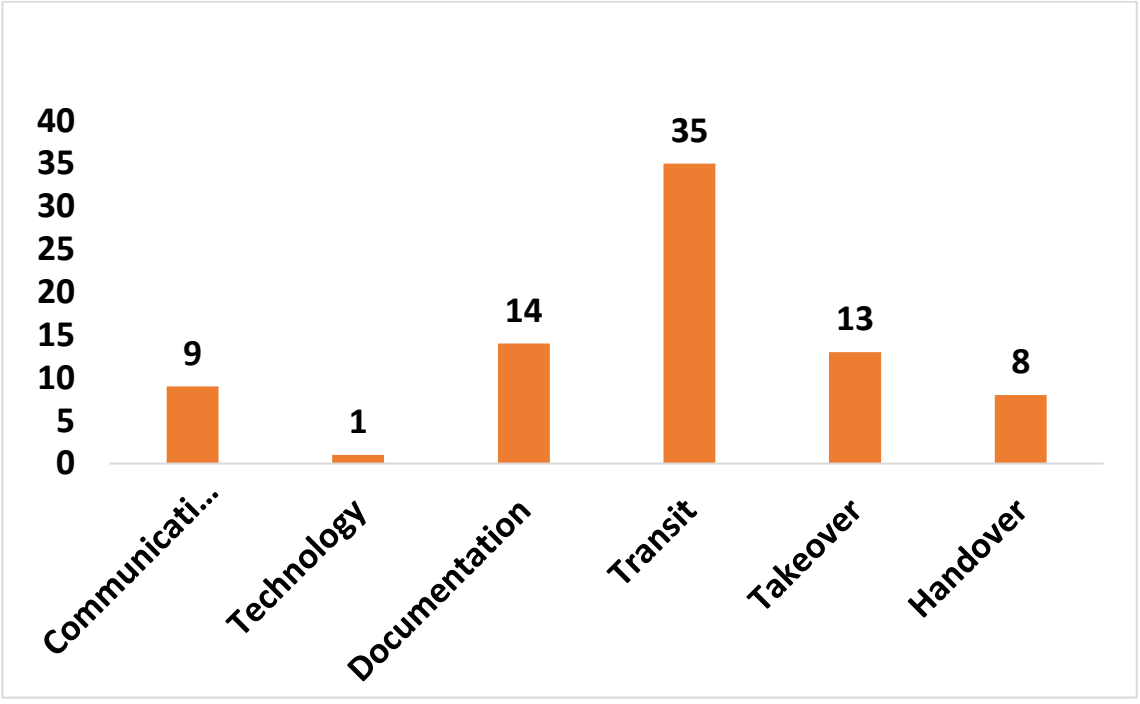


Figure 5 depicts more 35 minutes time is devoted in Transit.13 minutes more is consumed in takeover when compared to standards as per guidelines of the hospital. More time is devoted to handover (more 8 minutes) when compared to standards

Communication is consuming 34 minutes when compared to standard 25 minutes which means it is consuming 9 minutes more than the standard. Usage of Technology is consuming 11 minutes when compared to standard 10 minutes which means it is consuming 1 minute more than the standard. Documentation is consuming 134 minutes when compared to standard 120 minutes which means it is consuming 14 minutes more than the standard. Transit is consuming 50 minutes when compared to standard 15 minutes which means it is consuming 35 minutes more than the standard. Takeover is consuming 43 minutes when compared to standard 30 minutes which means it is consuming 13 minutes more than the standard. Taking another nurse's staff assignment is consuming 7 minutes of time which is not there in the standard. Handover to next shift staff and over to Team leader is consuming 48 minutes when compared to standard 40 minutes which means it is consuming 8 minutes more than the standard.

Reasons for deviations from the standard time taken by possible reasons and suggestions for managing time

Concerns	**Reasons**	**Suggestions**
Less time devoted to Direct – Indirect Patient Care	Transit takes 35 minutes more because the patient handing over to the other points of care takes more than desired time because other staff do not entertain them, and they cannot leave the patient alone	Prior information and coordination with the other points of care should be done over telephone Nearest Patient assignment may help
Documentation	14 more minutes are spent on documentation	e-documentation may help time management e-documentation may help time management

Discussion

The highest amount of mean time is spent in Transit (50 minutes) over standard of 15 minutes. The second highest amount of time is spent on documentation (134 minutes) over standard 120 minutes. There is less time devoted to Direct patient care (123 minutes) over standard 150 minutes and Indirect patient care which is 69 minutes over standard of 75 minutes. The current study highlights the excess time spent in transit. Transit i.e. travelling from patient room to the nursing station or shifting patients to other wards or transferring patients to Operation theatres consumes a lot of nursing time. Making prior

arrangements before shifting patients may reduce the time spent in transit. Also, assigning nearby patients to the nurses will reduce the travel time incurred in walking from one patient room to another room.

Conclusion

Time-motion study will help to cite out reasons for the delay in carrying out activities. Also, the inefficiencies in carrying out routine activities of nurses will be highlighted which can be worked upon. This will help improve the efficiency of work and thereby increase productivity.

One-tenth of time was spent on transit which can be managed by prior communication and coordination with the other points of care over telephone. E documentation may help in reducing time and may give scope to increase direct and indirect patient care. Trained assistants may be prepared for some activities which can be done by them after adequate training

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Michelle White. A COST BENEFIT ANALYSIS OF A HOME CARE AIDE

Annexure

Table 1: Data Collection Checklist

1.Indirect Patient Care	**Time Spent in mins**	**Remarks**
Inventory check		
Medicine Preparation		
Taking medicines from store		
Removing medicines from shelves		
Other		
TOTAL		
2.Direct Patient Care		
Medicine administration		
Recording Patient vitals		
Assisting consultants in rounds		
Giving saline		
Recording height and weight		
Putting IV		
Sponging		
Other		
TOTAL		
3.Communication		
Doctor		
Nurse		
Assistant		
Housekeeping		
Answering phone calls		
Other		
TOTAL		
4.Technology		
Use of PC		
Other		
5.Documentation		
Daily assessment		
Medicine		
Nursing notes and plan		
TOTAL		
6.Transit		
Travelling from patient bed to Nursing station		
Travel to OT/ other ward		
TOTAL		
7.Takeover		
8.Personal time		

9.Took another staff assignment		
10.Handover to next shift staff and over to Team Leader		
11.Searching for patient file/other		
TOTAL		

TABLE 2: Total time taken by 30 nurses for completion of various activities

ACTIVITY	Time Spent in mins	Average/Mean	Percentage
1.Indirect Patient Care			
Inventory check	**1016**	**34**	6
Medicine Preparation	**539**	**18**	3
Training/attending ppt	**67**	**2**	0
Taking medicines from store	**244**	**8**	2
Removing medicines from shelves	**218**	**7**	1
TOTAL	**2084**	**69**	13
2.Direct Patient Care			
Medication administration	**1220**	**41**	8
Recording Patient vitals	**780**	**26**	5
Assisting consultants in rounds	**440**	**15**	3
Giving saline	**287**	**10**	2
Recording height and weight	**513**	**17**	3
Sponging	**159**	**5**	1
Putting IV	**276**	**9**	2
TOTAL	**3675**	**123**	23
3.Communication			
Doctor	**346**	**12**	2
Nurse	**226**	**8**	1
Assistant	**100**	**3**	1
Housekeeping	**141**	**5**	1
Answering phone calls	**203**	**7**	1
TOTAL	**1016**	**34**	6
4.Technology			
Use of PC	**331**	**11**	2
5.Documentation			
Daily assessment	**1413**	**47**	9
Medicine	**1108**	**37**	7
Nursing notes and plan	**1500**	**50**	9
TOTAL	**4021**	**134**	25
6.Transit			
Travelling from patient bed to Nursing station	**952**	**32**	6
Travel to OT/ other ward	**537**	**18**	3
TOTAL	**1489**	**50**	9
7.Takeover	**1290**	**43**	8
8.Personal time	**442**	**15**	3
9.Took another staff assignment	**200**	**7**	1
10.Handover to next shift staff and over to TL	**1435**	**48**	9
11.Searching for patient file/other	**81**	**3**	1
TOTAL	16064	**537**	100

TABLE 3: According to hospital guidelines, standard time taken for activities in 8 hours shift in minutes v/s actual time recorded

ACTIVITY	STANDARD	ACTUAL	DIFFERENCE
1.Indirect Patient Care	75	69	-6
2.Direct Patient Care	150	123	-27
3.Communication	25	34	+9
4.Technology	10	11	+1
5.Documentation	120	134	+14
6.Transit	15	50	+35
7.Takeover	30	43	+13
8. Personal time	15	15	0
9.Took another staff assignment	-	7	
10.Handover to next shift staff and over to TL	40	48	+8
11.Searching for patient file/other	-	3	
TOTAL	**480**	**537**	

Table 5: Calculation of outliers

Activity	Time consumed	Outlier	Z test
Use of PC	**7**	**FALSE**	0.15
Use of PC	**8**	**FALSE**	0.24
Use of PC	**12**	**FALSE**	0.59
Use of PC	**14**	**FALSE**	0.76
Use of PC	**17**	**FALSE**	1.03
Use of PC	**11**	**FALSE**	0.50
Use of PC	**2**	**FALSE**	-0.29
Use of PC	**11**	**FALSE**	0.50
Use of PC	**9**	**FALSE**	0.32
Use of PC	**9**	**FALSE**	0.32
Use of PC	**5**	**FALSE**	-0.03
Use of PC	**7**	**FALSE**	0.15
Use of PC	**17**	**FALSE**	1.03
Use of PC	**9**	**FALSE**	0.32
Use of PC	**17**	**FALSE**	1.03
Use of PC	**15**	**FALSE**	0.85
Use of PC	**24**	**FALSE**	1.64
Use of PC	**24**	**FALSE**	1.64
Use of PC	**16**	**FALSE**	0.94
Use of PC	**5**	**FALSE**	-0.03
Use of PC	**13**	**FALSE**	0.68
Use of PC	**8**	**FALSE**	0.24
Use of PC	**7**	**FALSE**	0.15
Use of PC	**6**	**FALSE**	0.06
Use of PC	**6**	**FALSE**	0.06
Use of PC	**18**	**FALSE**	1.12
Use of PC	**8**	**FALSE**	0.24
Use of PC	**9**	**FALSE**	0.32
Use of PC	**13**	**FALSE**	0.68
Use of PC	**14**	**FALSE**	0.76