

A hand is placing a wooden block with a plus sign on top of a pyramid of other medical-themed wooden blocks. The pyramid consists of four rows: the bottom row has four blocks (bandage, stethoscope, syringe, pill bottle), the second row has three blocks (blood drop, first aid kit, wheelchair), the third row has two blocks (pill, heart with pulse line), and the top block is the plus sign. The background is a soft, out-of-focus light brown.

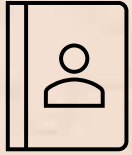
Capacity Utilization of Dialysis Department of a Tertiary Care Hospital using TDABC model

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Introduction



What

is capacity building?

It is the relationship between output that **is** produced with the installed equipment, and the potential output which **could** be produced with it, if capacity was fully used.



How

- to calculate the capacity utilization rate?

$$\text{Capacity utilization rate} = \frac{\text{Capacity utilized} \times 100}{\text{Optimum capacity}}$$

- to calculate the capacities?

Time-driven activity-based costing method



Why

is it important?

To monitor and increase **resource efficiency**.



Where

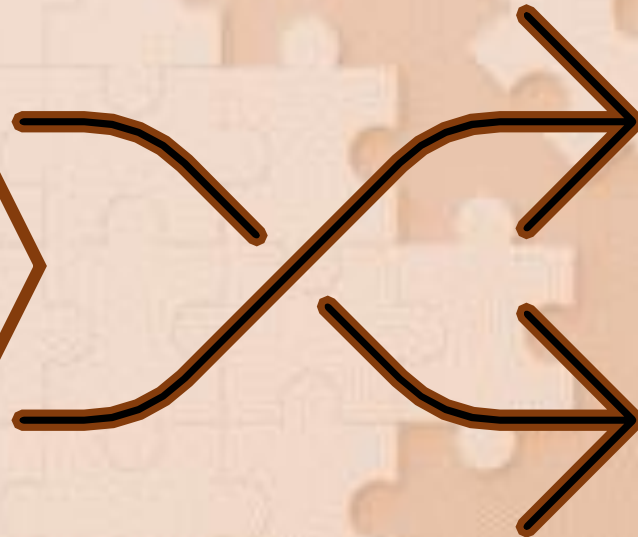
was it estimated?

Dialysis department of a tertiary care hospital in Navi Mumbai.

It is one of the **reliable** and **continuous** sources of income for the hospital.

Aim

This study aims to provide a clear, fact-based capacity utilization level of the two major resources of dialysis department and give recommendations to improve the same.



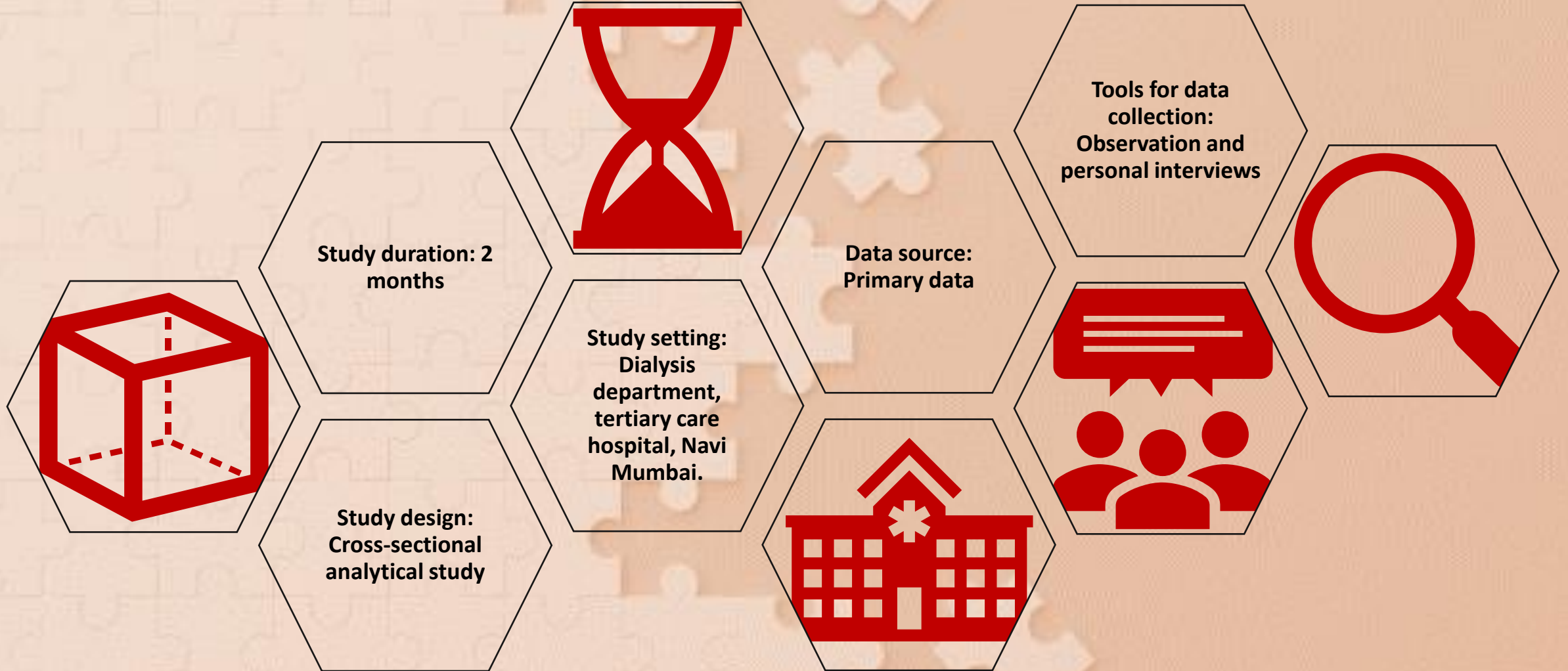
Objectives

To estimate the capacity utilization of manpower and dialysis machines of the dialysis department using time-driven activity-based costing (TDABC) model.

To provide recommendations to the hospital in terms of increasing the capacity utilization of manpower and dialysis machines of the dialysis department.



Methodology



Time-driven Activity-based Costing

Phase A: Identification
of resources



Phase B: Estimation
of unit times



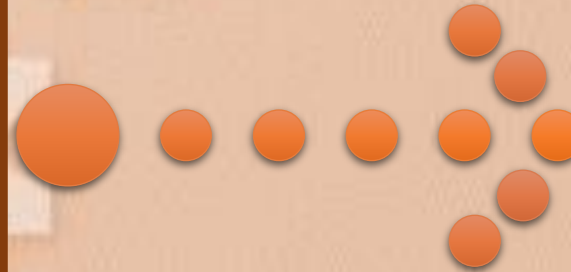
Phase C: Estimation
of unit costs



Phase D: Estimation of
cost driver rates



Resource
Capacities



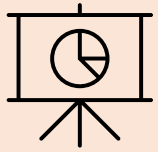
Capacity
Utilization
Rate (%)



Literature Review



Title	Year	Authors	Study location	Sample size	Sampling technique	Salient features
Time-driven activity-based costing in an outpatient clinic environment: Development, relevance and managerial impact	2009	Demeere N, Stouthuysen K, Roodhooft F	Belgium	5 departments	Purposive sampling	• Identification of activities which demanded more time. • Future investment decisions.
A New Costing Model in Hospital Management: Time-Driven Activity-Based Costing System	2013	Oker F, Ozyapici H	Magusa Yasam Hospital, Cyprus	2 surgeries	Purposive sampling	• Price competitiveness by excluding the price of unused capacities. • Cost-effectiveness by indicating the number of employees to be dismissed or directed to other productive areas.
Cost Comparison of Ultrasound Versus MRI to Diagnose Adolescent Female Patients Presenting with Acute Abdominal/Pelvic Pain Using Time-Driven Activity-Based Costing	2019	Hagedorn K, Hayatghaibi S, Levine M	Tertiary care paediatric emergency centre	2 diagnostic modalities	Purposive sampling	• Identification of inefficiencies in the system.



Results

1

Capacity utilization and cost driver rates (per day)

<i>Resource</i>	<i>Available practical capacity (minutes)</i>	<i>Capacity utilized (minutes)</i>	<i>Capacity utilization (%)</i>	<i>Cost driver rates (₹)</i>
<i>Manpower</i>	13440	12288	91.43	45,235.20
<i>Dialysis machine</i>	24480	18000	73.53	1,42,200

2

Unused capacity and its associated costs (per day)

<i>Resource</i>	<i>Available practical capacity (minutes)</i>	<i>Capacity unutilized (minutes)</i>	<i>Unused capacity rate (%)</i>	<i>Costs (₹)</i>
<i>Manpower</i>	13440	1152	8.57	4240
<i>Dialysis machine</i>	24480	6480	26.47	64,800



Discussion



Manpower utilization (technicians & house keeping)

- Number of positions = Number of personnel
- No resource on standby for emergency/ leave of absence



Night slots (Feb – April 2020)

- 53 dialysis cycles = 51 IPD + 2 OPD cases
- Resources are almost idle causing losses



Practical capacity utilization

- It should ideally be 100%
- Very low for machine

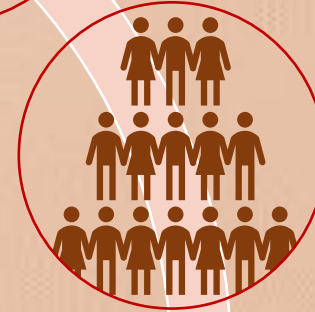


Suggestions

Regular
night slots
for
dialysis



Higher
efficiency
of resources



Increase in
patient
count



Increase in
revenue



Lower cost
services

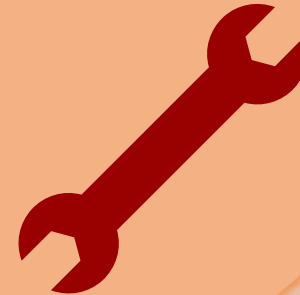


Conclusion



By implementing the TDABC system on a broader level, further unrealized areas for efficiency enhancement can be identified, moving the hospital towards a more sustainable future.

Valuable operational insights from the study have opened doors to TDABC as a new tool to maintain and assess the financial and operational health of an organization.



References

1. Dr. Desai V. Are Indian Hospitals Profitable? - Healthcare Executive. 2019.
2. Kaplan R, Porter M. How to solve the cost crisis in health care [Internet]. Harvard Business Review; 2011. Available from: https://ie.technion.ac.il/~serveng/course2004/Lectures/Kaplan_Porter_2011-9_How-to-Solve-the-Cost-Crisis-in-Health-Care_HBR.pdf
3. Kaplan R, Anderson S. Time-Driven Activity-Based Costing [Internet]. 2003. Available from: <https://poseidon01.ssrn.com/delivery.php?ID=165004066095106065081097122007011105123084002028060035065097017069124068109105001118025018021022008009118085117081118007069019080058093028090098024109027116064020038007031100127102107114005017081011109103094122076110112101111089109093121093115116&EXT=pdf>
4. Pradhan Mantri National Dialysis Programme | National Health Portal Of India [Internet]. Nhp.gov.in. 2020. Available from: https://www.nhp.gov.in/pradhan-mantri-national-dialysis-programme_pg
5. Demeere N, Stouthuysen K, Roodhooft F. Time-driven activity-based costing in an outpatient clinic environment: Development, relevance and managerial impact [Internet]. 2009. Available from: <https://www.sciencedirect.com/science/article/abs/pii/S0168851009001316>
6. Oker F, Ozyapici H. A New Costing Model in Hospital Management: Time-Driven Activity-Based Costing System [Internet]. 2013. Available from: https://journals.lww.com/healthcaremanagerjournal/Abstract/2013/01000/A_New_Costing_Model_in_Hospital_Management_.4.aspx
7. Hagedorn K, Hayatghaibi S, Levine M. Cost Comparison of Ultrasound Versus MRI to Diagnose Adolescent Female Patients Presenting with Acute Abdominal/Pelvic Pain Using Time-Driven Activity-Based Costing [Internet]. 2019. Available from: <https://www.sciencedirect.com/science/article/abs/pii/S1076633219301825>
8. Shankar P, Hayatghaibi S, Anzai Y. Time-Driven Activity-Based Costing in Radiology: An Overview [Internet]. 2019. Available from: <https://www.sciencedirect.com/science/article/pii/S154614401930835X>
9. Lewis SB, Srinivasa RN, Shankar PR, Bundy JJ, Gemmete JJ, Chick JFB. Thoracic duct embolization—value analysis using a time-driven activity-based costing approach: a single institution experience. Curr Probl Diagn Radiol 2018 2018/12/18/. 2018 Dec 18. pii: S0363- 0188(18)30243-3. <https://doi.org/10.1067/j.cpradiol.2018.12.007>. [Epub ahead of print]. Available at: <https://www.sciencedirect.com/science/article/pii/S0363018818302433>
10. Anzai Y, Heilbrun ME, Haas D, et al. Dissecting costs of CT study: application of TDABC (time-driven activity-based costing) in a tertiary academic center. Acad Radiol 2017;24:200-8. 2017. Available at: <https://www.sciencedirect.com/science/article/pii/S1076633216303439>
11. Alves RJV, Etges A, Neto GB, Polanczyk CA. Activity-based costing and time-driven activity-based costing for assessing the costs of cancer prevention, diagnosis, and treatment: a systematic review of the literature. Value Health Reg Issues 2018;17:142-7. 2018. Available at: <https://www.sciencedirect.com/science/article/pii/S2212109918301092>
12. Keel G, Savage C, Rafiq M, Mazzocato P. Time-driven activity-based costing in health care: a systematic review of the literature. Health Policy 2017;121:755-63. 2019. Available at: <https://www.sciencedirect.com/science/article/pii/S0168851017301240>
13. Hoozee S, Bruggeman W. Identifying operational improvements during the design process of a time-driven ABC system: The role of collective worker participation and leadership style [Internet]. 2010. Available from: <https://www.sciencedirect.com/science/article/abs/pii/S1044500510000120>
14. The Hindu BusinessLine. Covid-19 leaves private healthcare sector in financial distress: FICCI-EY study. Available at: <https://www.thehindubusinessline.com/economy/macro-economy/covid-19-leaves-private-healthcare-sector-in-financial-distress-ficci-ey-study/article31362331.ece>