



Efficiency and workflow assessment of GDA for medicine distribution

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Key Research Questions

1. Are there any variations in the number of trips made to the different patient care areas by the GDAs?
2. Does the amount of medicine delivered affect the number of trips made to different patient care areas?
3. What is the change in delivery pattern throughout the day?

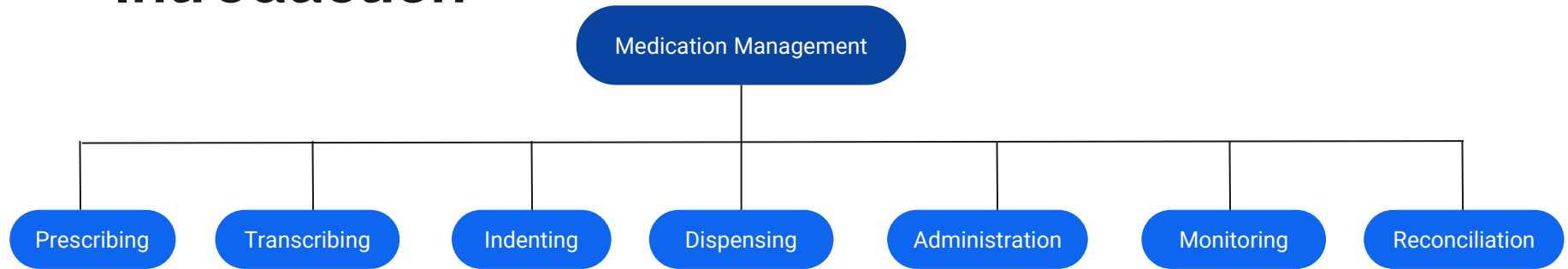
About the organisation

- Established in 2009, Medanta and 5 branches over the last 13 years. The hospital combines cutting-edge technology, world-class infrastructure, and renowned medical professionals to provide exceptional healthcare services.
- It is a 1,171 bed multi-specialty, tertiary care healthcare organisation.
- The institute offers a wide range of medical specialties and super-specialties, including cardiology, oncology, neurology, orthopedics, and more.
- It is a NABH, NABL, and JCI accredited organisation
- Medanta has a renowned organ transplant program, including heart, kidney, liver, lung, and bone marrow transplants.





Introduction



Medication management: The process of ensuring safe, effective, and appropriate use of medications for patients.



Introduction

Medication errors: Mistakes in prescribing, dispensing, administering and other areas during medications can lead to patient harm.

- **Human factors:** Fatigue, distraction, lack of concentration, and inadequate training.
- **Look-alike or sound-alike medications:** Medications with similar names or packaging that can be easily confused.
- **Workflow issues:** High workload, time pressures, and inadequate systems or processes.
- **Communication errors:** Misinterpretation of prescription information or incomplete information.



Problem Statement

The presence of workflow issues, notably delays in medication dispensing, and medication delivery poses a significant challenge at Medanta - The Medicity, Gurgaon. Addressing these issues is essential to ensure patient satisfaction, timely and accurate medication administration, enhance patient safety, and minimize the risk of medication errors.

Rationale behind the study: Existing inefficiencies in the delivery system. Also, the pharmacy department is a Strategic Business Unit (SBU).

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Objective

The objective is to evaluate the efficiency of the clinical pharmacy GDA team's medication delivery process from the centralised IP pharmacy to various patient care areas in a multi-specialty, tertiary care hospital.



Literature Review

- 14 literature reviews were conducted as a part of the background research to provide a deeper understanding of the problem.
- Studies that have delved into the discovery of medication errors, more specifically dispensing errors were included.
- It was discovered that dispensing error was prevalent even after stringent checks at various stages.
- Incorrect drugs, dosage, quantity were few of the errors which were recorded most frequently.
- A study done in India by Geetha Kandasamy et al (2021) recorded 67% dispensing error leading to delay in dispensing of medication (1).
- An Australian study by Susan G. Poole et al (2021) recorded similar findings of 68% dispensing errors leading to delays (2).

References:

1. Kandasamy, G, Sivanandy, P, Almaghaslah, D, et al. A cross-sectional study on prescribing and dispensing errors at a corporate hospital in South India. Int J Clin Pract. 2021; 75:e14489. <https://doi.org/10.1111/ijcp.14489>
2. Poole, S.G., Kwong, E., Mok, B., Mulqueeny, B., Yi, M., Percival, M.A., Marsom, E.N., Duncan, C. and Graudins, L.V. (2021), Interventions to decrease the incidence of dispensing errors in hospital pharmacy: a systematic review and meta-analysis. J Pharm Pract Res, 51: 7-21. <https://doi.org/10.1002/jppr.1709>

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Methodology

Study setting: Centralised IP Pharmacy located in lower ground floor of Medanta - The Medicity, Gurgaon

Study population: Clinical pharmacy GDA staff members

Sampling technique: Census sampling

Inclusion criteria

17 members of the clinical pharmacy GDA team

Areas included are the

- IPD wards
- ICUs
- HCC

Exclusion criteria

Any other GDA staff

Patient care areas not serviced by the clinical pharmacy GDA team:

- Emergency
- OT
- Daycare
- Chemo-daycare
- Ayurveda
- Dental sciences
- Interventional radiology



Current staff deployment

Patient care areas	Number of GDAs
Wards	10
ICUs	6
HCC	1
Total	17

Current staff deployment

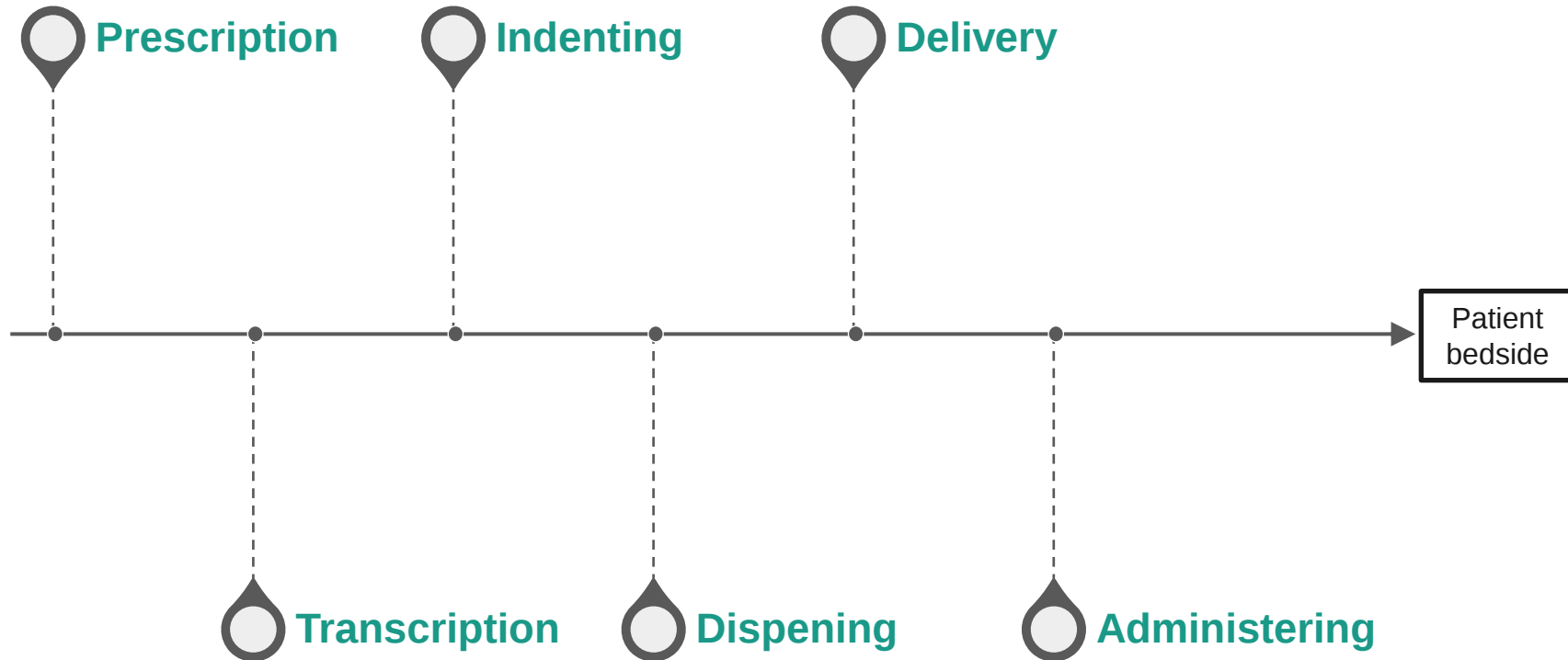
GDA	Patient care area
GDA 1	5th floor B wing
GDA 2	6th floor A & B wing
GDA 3	7th floor A & B wing
GDA 4	8th floor A & B wing
GDA 5	9th floor A & B wing
GDA 6	10th floor B wing
GDA 7	11th floor A & B wing
GDA 8	12th floor A & B wing
GDA 9	14th floor A & B wing
GDA 10	15th floor A & B wing
GDA 11	HCC
GDA 12	ICU 1 & 2
GDA 13	ICU 3 & 4
GDA 14	ICU 5 & 6
GDA 15	ICU 7 & 8
GDA 16	ICU 9 & 10
GDA 17	ICU 11



Research Approach

- Identification: members who are part of the clinical pharmacy GDA team
- Permissions and approvals: necessary permissions and approvals were obtained from higher management and stakeholders involved in the process
- Duration of the study: The tracking took place for **17 days**, from 13th March 2023 to 31st March 2023.
- Workflow assessment: Each day, a single clinical pharmacy GDA staff member was tracked for their entire shift, starting from 08:00 AM until 08:00 PM.
- Data collection: The exact time when the GDA leaves from the centralized IP pharmacy to their designated patient care area was recorded.
- Repetition: The process was repeated for all the GDAs, one after the other.

Process flow for medication delivery



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Efficiency of GDA

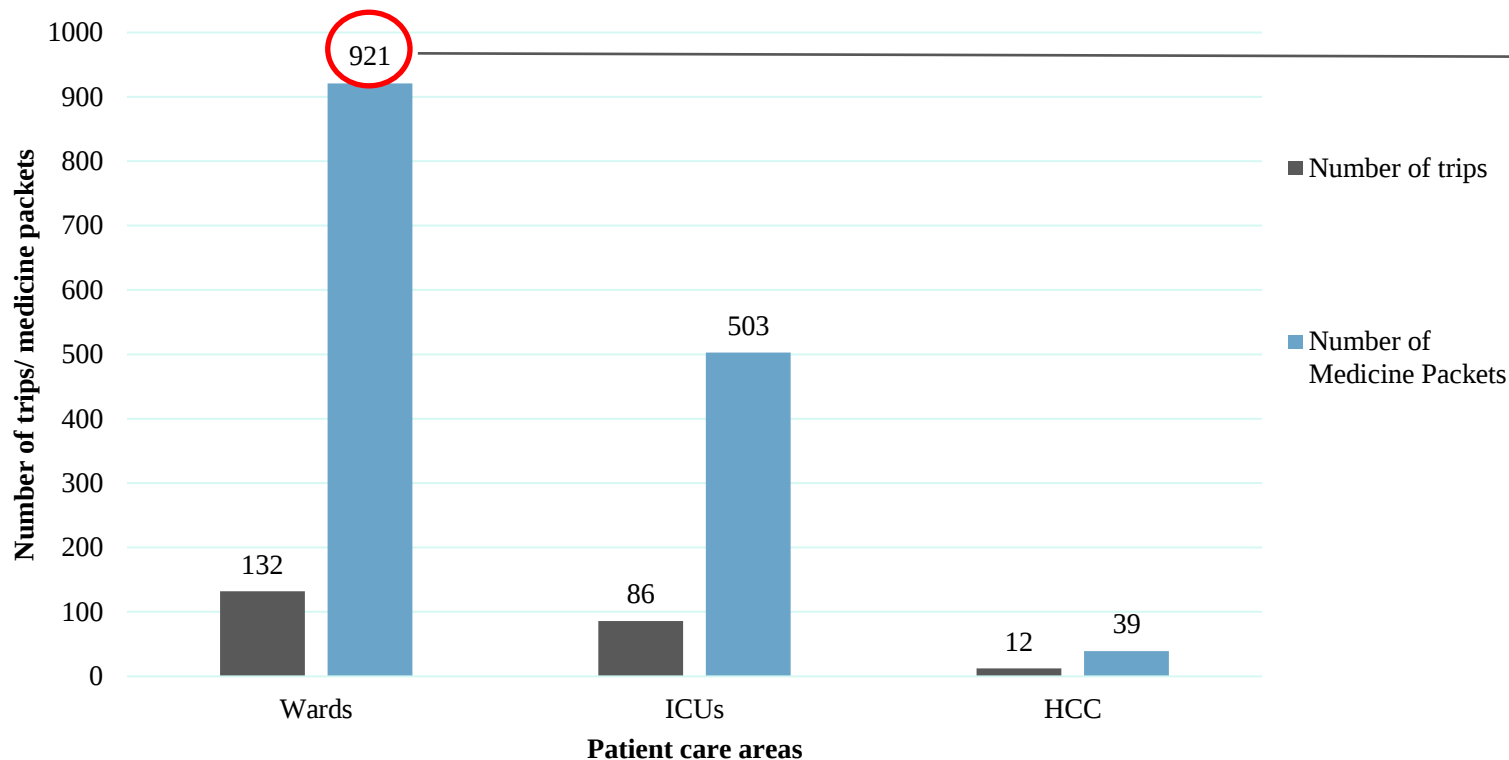
- Each GDA is supposed to make 1 trip from the centralised IP pharmacy to the patient care area every 20 mins.
- So, throughout their entire shift, they are supposed to make 36 trips.



Results

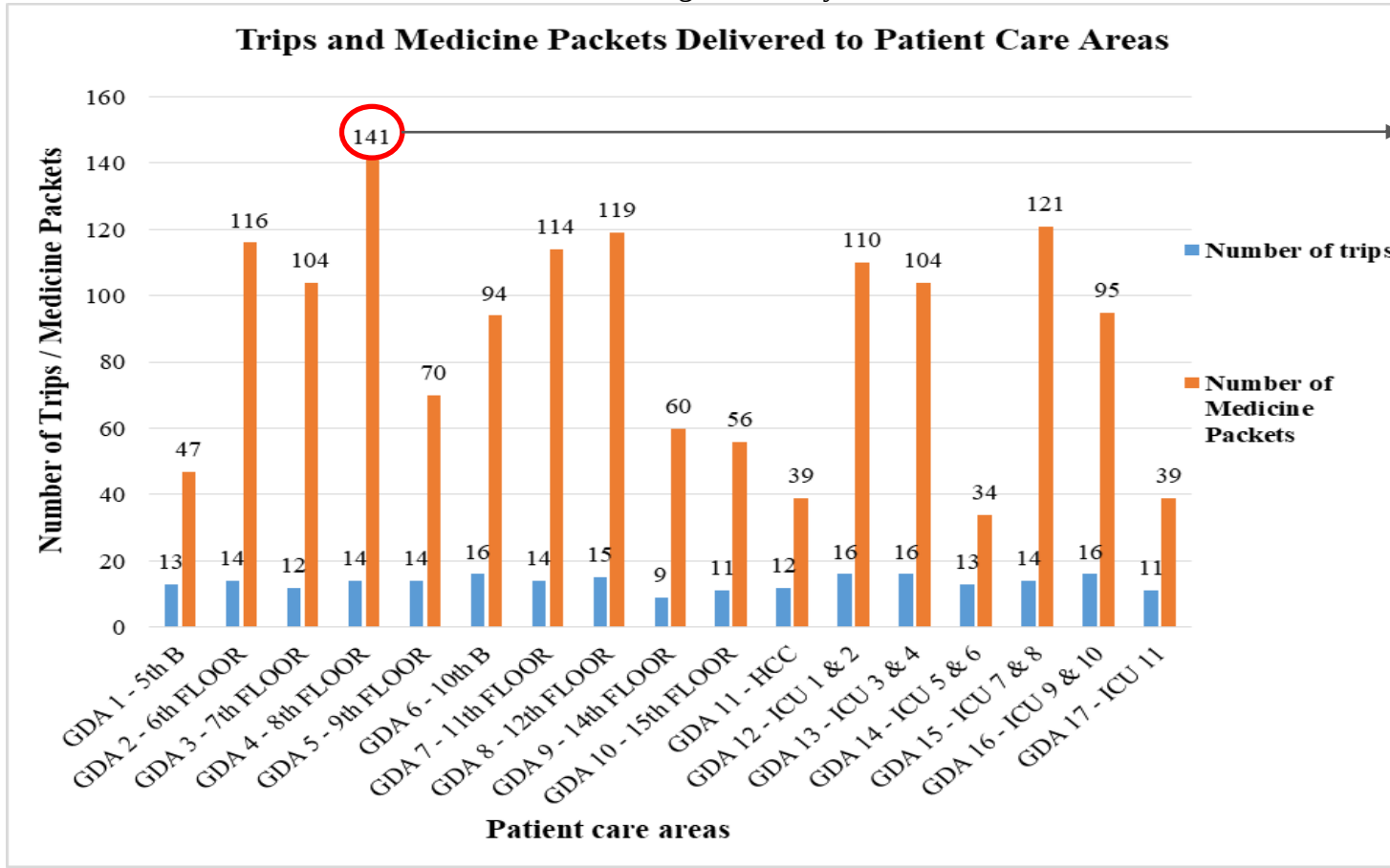
Graphical representation of clinical pharmacy GDA team and the number of trips made by them from 08AM-08PM,
throughout 17 days

Number of trips and number of medicine packets delivered between 08AM-08PM



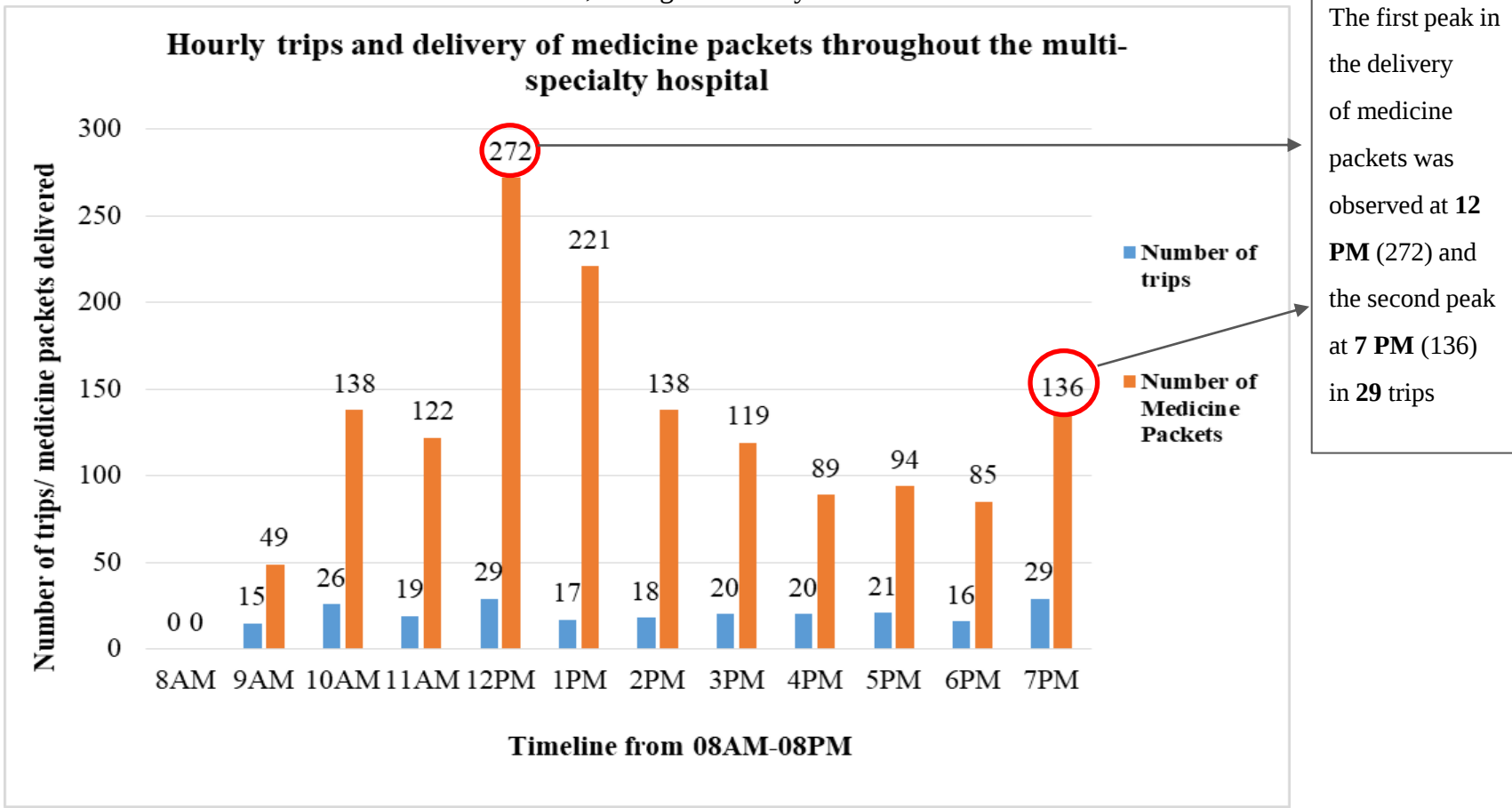
The highest
number of
medicine
packets
were delivered
921 in
the **wards**

Graphical representation of clinical pharmacy GDA team and the number of trips made by them from 08AM-08PM, throughout 17 days



The highest number of medicine packets were delivered were **141** at **8th floor**

Graphical representation of clinical pharmacy GDA team and the number of trips made by them from 08AM-08PM, throughout 17 days



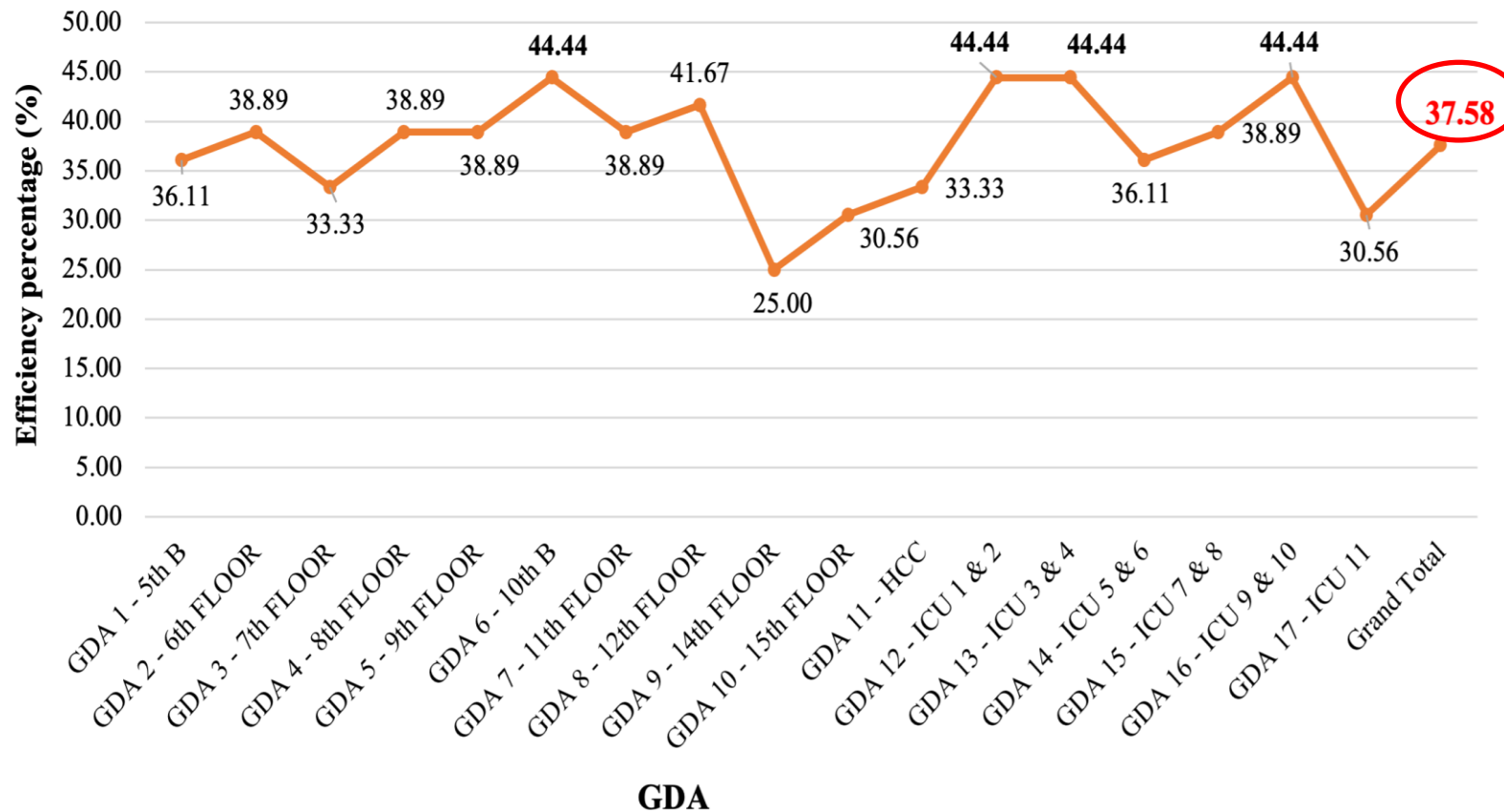


Descriptive statistics

Table showcases the calculated mean, median, mode, and standard deviation for the number of trips and medicine packets delivered by the 17 clinical pharmacy GDA staff overall over the course of their shift.

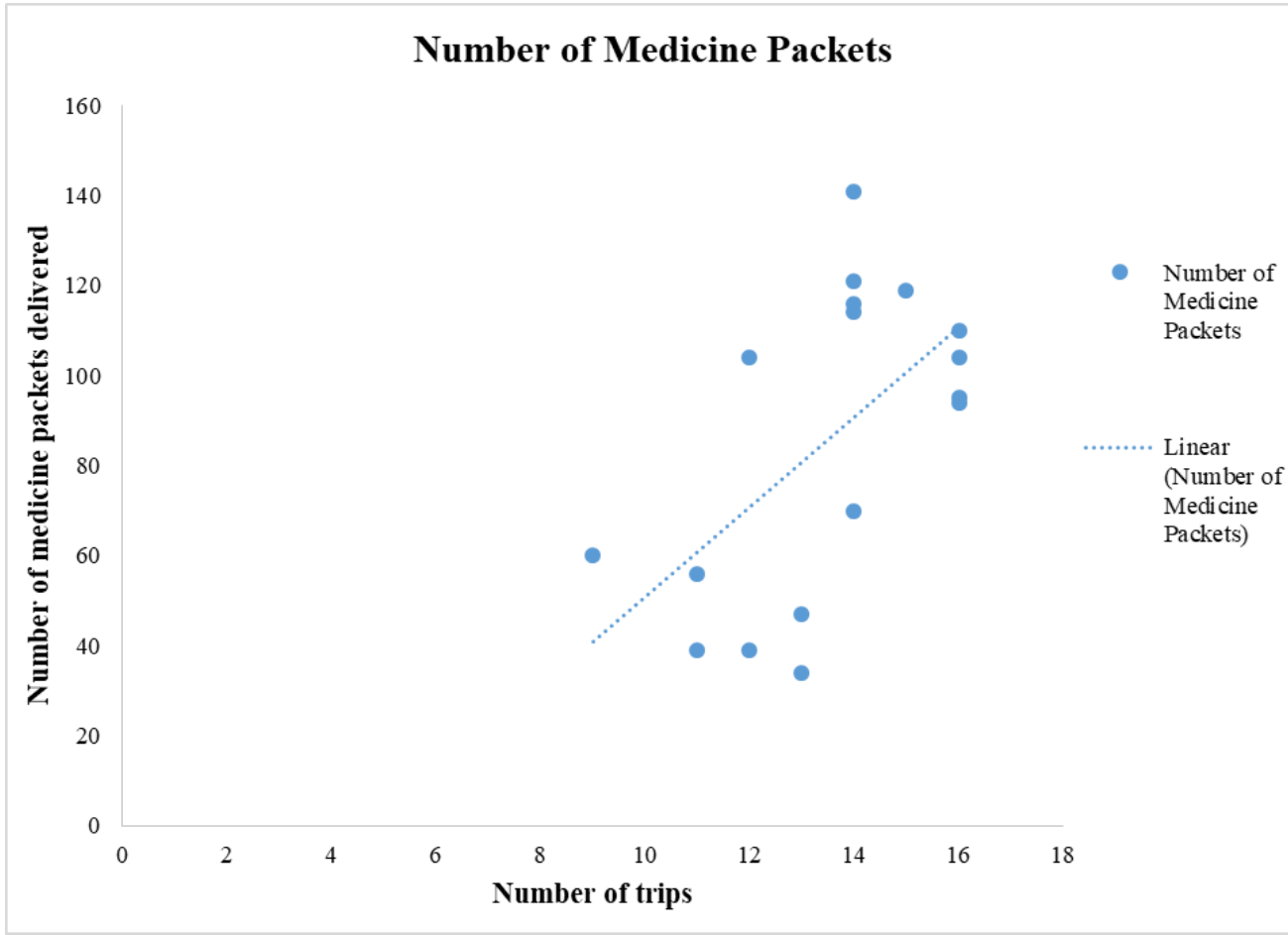
	Grand Total	Mean	Median	Mode	Standard deviation
Trips	230	13.53	14	14	1.97
Medicine packets	1463	86.06	95	104	33.31

Efficiency percentage



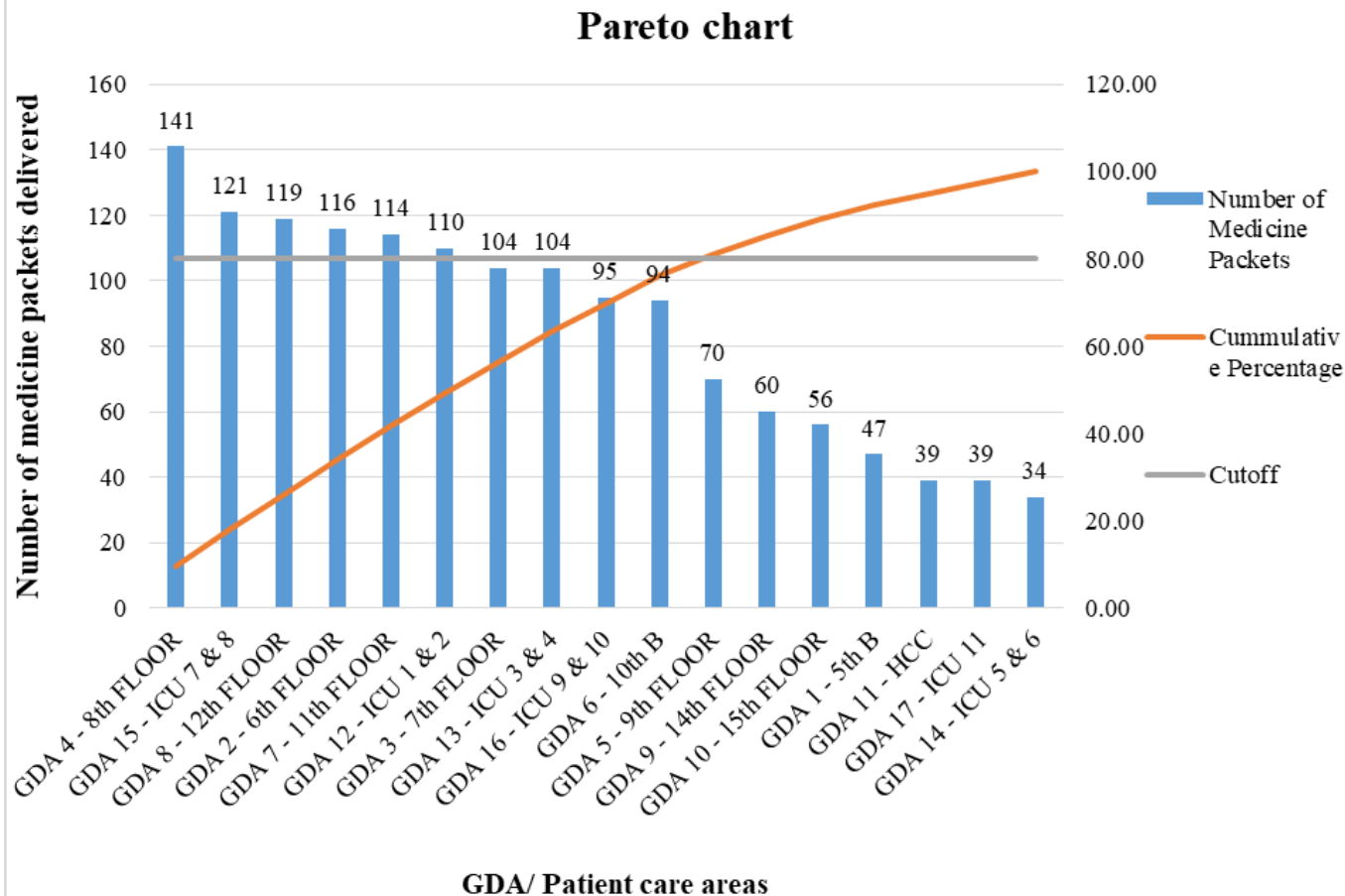
Overall
efficiency
was found to
be 37.58%

Correlation between number of trips made and number of medicine packets delivered



Correlation
coefficient = **0.59**

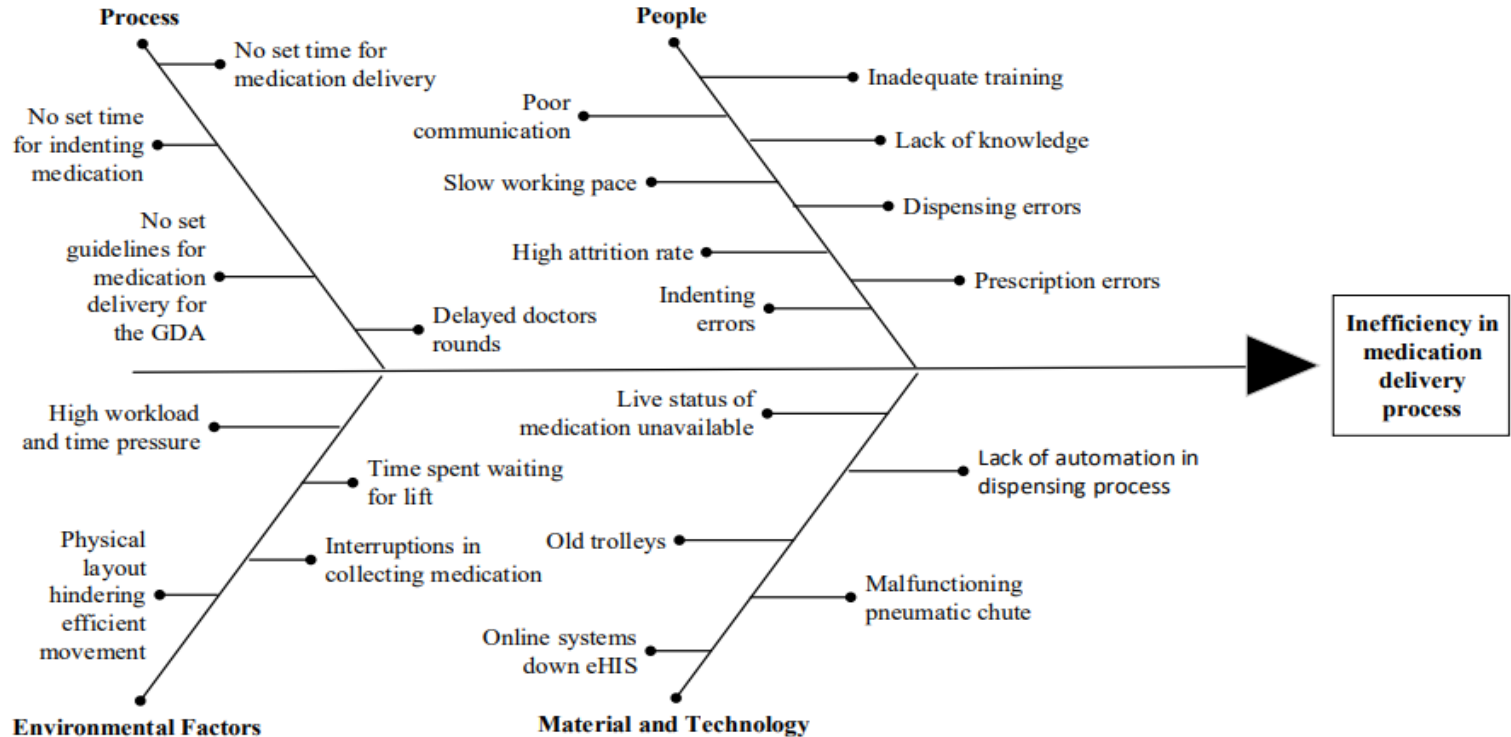
Moderately
positive



6 out of 17 patient care areas had the highest number of deliveries

Ishikawa diagram

Cause and effect analysis of inefficiency in medication delivery process





Strengths of the study

- Identifying the inefficiency of the GDAs
- Census sampling technique
- Multiple variables being studied
- Internal consistency is derived by applying descriptive statistics, correlation test, efficiency percentage calculation
- Practical implications for Medanta to re-look at their medication management process
- Real world relevance as it can help other organisations as well

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Limitations of the study

- Only single-day data was taken for each GDA
- It can vary day by day
- Lack of control group - as that would have presented more learnings
- Data collection method limited due to a single researcher study
- Human error in the data collection process



Recommendations



Human Resources:

Staff reallocation, re-training is required for increasing the efficiency



Process:

Grouping deliveries - ICU 1 & 2, ICU 3 & 4 are all on the same floor so they can be catered by single GDA



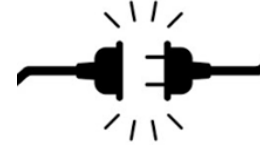
Prioritise:

Prioritize high demand areas as reflected on the pareto chart



Monitoring & Evaluation:

Monitoring and evaluation of the reallocation of the staff and the changes being implemented in the process



Maintenance:

Repairing the malfunctioning pneumatic chute needs to be considered



Technological Advancements:

Automated medication dispensing systems, and porter managements system



Interventions



Intervention – Grouping

1. **ICU 9 & 10 and ICU 11** - allocate a single GDA to deliver as they are all located on the same floor (2nd)
 - This is because 95 medicine packets were delivered to ICU 9 & 10 and 39 medicine packets were delivered to ICU 11 which collectively make **134 packets**.
 - Their efficiency percentage was **44%** and **31%** respectively which is not a very good indicator, so repurposing the already existing staff can be done.
2. **5th B and 6th floors** can be served by a single GDA,
 - As medicine packets delivered to 5th B is 47 and to 6th floor is 94 which makes the total **141 packets** and if we look at the highest number of packets delivered was also 141 and done in 14 trips.
 - Their efficiency percentage was **36%** and **39%** respectively.

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Intervention – PMS

Porter Management System (PMS), a pilot has been conducted in another GDA team and phase implementation will take place in the coming months.

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Intervention – Pneumatic Chute

- The malfunctioning pneumatic chute leads to a lot of issues. An external audit of the machinery has been conducted which revealed that there was a problem with the coupler.
- Preliminary meetings with the stakeholders have been organised to plan the repairs.

Thank you!