



Business Data Management

Mid-Term Submission



Harnessing Data For Pharma Excellence

(Case Study of Medicure Life Sciences, India Private Limited and the problems they face)

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1. Executive Summary

Mr. Srinivas Rao K, the Managing Director of Medicure Lifesciences India Pvt Ltd, established the company in 2009 with its headquarters in Hyderabad. Under his leadership, the company has achieved an impressive annual turnover of over ₹30 crore, supported by a dedicated team of more than 40 employees, soon to grow to 70. With a strong blend of marketing and sales talent, Medicure Lifesciences has expanded its operations across southern states, Maharashtra, and Goa, with plans for further geographic growth. The company currently promotes over 120 brands, delivering affordable, high-quality medicines to patients in need.

The initial phase of this project focused on identifying key operational challenges faced by Medicure Lifesciences. Through stakeholder discussions and exploratory data analysis, it was observed that the company struggles with high attrition rates, inconsistencies in pricing strategies, and inefficiencies in supply chain management. The proposal outlined a data-driven approach to address these challenges by analyzing employee retention trends, evaluating pricing strategies, and identifying optimization opportunities within the supply chain.

As part of the midterm progress, extensive data cleaning and preprocessing were conducted to ensure accuracy in analysis. Key descriptive statistics revealed that employee attrition is highest in the 30-50 age group, particularly among employees earning mid-range salaries. The analysis also indicated significant salary disparities, with younger employees earning considerably less than their older counterparts, potentially impacting retention. Furthermore, the pricing analysis showed inconsistencies in MRP-to-PTR ratios, indicating potential misalignment with market standards. Competitive analysis using scatter plots highlighted gaps in Medicure's pricing strategy compared to competitors, underscoring the need for adjustments.

Additionally, product trends revealed promising growth in cardiology and diabetic drug segments, suggesting areas for future investment. Pricing variability across categories was also examined, showing that the Support segment had the highest average prices, while the Neuro segment had the lowest. These insights provide a foundation for refining pricing strategies and aligning them with market demand. Moving forward, the project will delve deeper into predictive modeling and optimization techniques to recommend actionable strategies for improving Medicure's overall business efficiency and market competitiveness.

2. Proof of Originality of the Data

Details:

- **Hyderabad Office Address:** #6-105/1/B/132 & 140/14p/A Gayathri Nagar, Godavari Homes, Suchitra to Quthbullapur Road, Hyderabad - 500055
- **Mumbai Office Address:** Plot No. K-23, Dighe Mide, Vishnu Nagar, Thane, Balapur Road, Navi Mumbai - 400701

Letter from Organization:



MEDICURE LIFE SCIENCES
INDIA PRIVATE LIMITED

To Whomsoever Concerned

Medicure Life Sciences India Private Limited
Quthbullapur Road, Hyderabad

Subject: Consent to Use Data

I, **Kaderi Srinivas Rao (MANAGING DIRECTOR)** of **Medicure Life Sciences India Private Limited**, hereby give consent to **Ms. Sibani Tiwari (student of IIT Madras Online degree program)** to utilize the data provided for their project as part of the course **Business Data Management of the IITM Madras online degree program**. This data is intended solely for academic and analytical purposes and must comply with confidentiality agreements and regulatory standards.

For Medicure Life Sciences India Private Limited

Kaderi Srinivas Rao
MD, Medicure Life Sciences India Private Limited



H.No. 6-105/1/B/132 & 140/14-A, "Srinivasa Nilayam", Gayathri Nagar, Godavari Homes,
Suchitra - Qutubullapur Road, HYDERABAD - 500 055. TELANGANA STATE
Phone: 040 6545 1133; Mobile: +91 9866432144, Fax: 040 69990066, E-mail : medicurelife@gmail.com
www.medicurelifesciences.com

Attached letter with on official letterhead with stamp and signature.

Images:



Links to additional images:

<https://drive.google.com/drive/folders/173ZJSgE5q21C7yELCEmc1hrPoaVhkERB?usp=sharing>

Links to Datasets:

1. [Productrt List New 25-10-2024.xlsx](#)
2. [PF SHEET SEPT 24.xlsx](#)
3. [HYD MEETING FORMAT OCT 2024-25.xlsx](#)

Analysis Sheets:

1. [analysis1.xlsx](#)
2. [analysis2.xlsx](#)

Interaction Video:

- *Brief video with the founder discussing key insights.*

https://drive.google.com/file/d/1TLrWF227SS_nqLOkQyJFOuOV-NDb9Eim/view?usp=drive_link

3. Metadata and Descriptive Statistics

3.1 Metadata:

- **Source of Data:** Provided by Medicure Life Sciences upon authorization(letter).
- **Datasets Overview:**
 - **Employee Data:** Contains employee details, including name, HQ, DOJ, DOB, Designation, CTC, Gross CTC, PF, Deductions, TDS, Net Payable, Bank Details, PAN and UAN
CTC (Cost to Company) is the total salary package covering salary, allowance, and benefits. The Gross CTC is the salary before deductions, and TDS (Tax Deducted at Source) is the tax deducted from income before payment, which reduces the final take home salary.

Variable	Description	Data Type
Name	Employee Name	String (Text)
HQ	Headquarters Location	String (Text)
DOJ	Date of Joining	Date
DOB	Date of Birth	Date
Designation	Employee Role	String (Text)
CTC	Cost to Company	Float (₹)
Gross CTC	Salary before deductions	Float (₹)
PF	Provident Fund Contribution	Float (₹)
Deductions	Salary deductions (TDS, etc.)	Float (₹)
TDS	Tax Deducted at Source	Float (₹)
Net Payable	Final take-home salary	Float (₹)
Bank Details	Employee Bank Information	String (Text)
PAN	Permanent Account Number	String (Text)
UAN	Universal Account Number	String (Text)

- **Product Data:** Includes medicine names, compositions, MRP, PTR, and PTS
MRP (Maximum Retail Price) is the highest price a product can be sold to consumers. PTR (Price to Retailer) is the price retailers pay to distributors, and PTS (Price to Stockist) is the price distributors pay to manufacturers. These are key points in the product pricing chain.

Variable	Description	Data Type
Medicine Name	Name of the Medicine	String (Text)
Composition	Chemical Composition	String (Text)
MRP	Maximum Retail Price	Float (₹)
PTR	Price to Retailer	Float (₹)
PTS	Price to Stockist	Float (₹)

- **Dataset Size:**

- Product Data: 91 rows, 6 columns.
- Employee Data: 48 rows, 18 columns.

3.2 Descriptive Statistics:

Key statistical measures computed:

- **Employee Data:**

- Mean Salary: Rs 29,625.17
- Median Salary: Rs 22,940

- Standard Deviation of Salary: Rs 26,541.97

Table 1: Salary by Age Group:

Age Group	Mean Salary (₹)	Median Salary (₹)	Count of Employees
20-30	18,684.10	17,250	10
30-40	28,566.00	23,900	15
40-50	28,631.25	25,050	8
>=50	96,250.00	96,250	2

Table 2: Attrition by Age Group:

Age Group	Active Employees	Exited Employees
20-30	9	1
30-40	13	2
40-50	6	2
>=50	2	0

Observations:

- Employees in the ">=50" age group have the highest average salary (₹96,250) but are few in number (2 employees).
- The "30-40" age group has the largest number of employees (15) and a moderate average salary (₹28,566).
- Attrition is relatively higher in the "30-40" and "40-50" age groups, with 2 employees exiting from each group.
- The majority of employees in the "20-30" age group are active, with only 1 employee having exited.

Product Data:

Table 3: Descriptive Statistics Table for MEDICURE

Price Type	Mean (₹)	Median (₹)	Std Dev (₹)
MRP (Maximum Retail Price)	105.66	96	56.16
PTR (Price to Retailer)	72.91	68.22	33.44
PTS (Price to Stockist)	1.7	0.61	10.09

Most products are priced below ₹100, but some high-end items create price variation; stockist prices show large disparity, suggesting inconsistent pricing strategies.

Table 4: Overall Statistics for PTS:

Metric	Value
Mean	68.87
Median	63
Standard Deviation	34.11

Table 5: Statistics by Segment for pts:

Segment	Mean	Median	Standard Deviation
CARDIO	65.85	54	34.21
DIABETIC	63.81	61.71	27.88
NEURO	76.12	78.42	26.17
SUPPORT	80.98	67.12	46.24

The average PTS across all products is **68.87**, with a **median** of **63.00**. This indicates that most values are centered around the 60–70 range. The **standard deviation** of **34.11** suggests a moderate spread in the data, meaning PTS values vary significantly across products

4. Detailed Explanation of Analysis Process/Method

4.1 Data Collection and Cleaning:

Authorization was sought to allow access to the needed data in order to observe compliance and transparency. The datasets were cleaned, eliminating inconsistencies and managing missing values to prepare the data for analysis.

4.2 Analysis Methods:

- 1. Attrition Analysis:** Bar charts were used to analyze turnover by salary and age groups. Employees were categorized by age and salary, and attrition rates computed as:
$$\text{Attrition Rate} = (\text{Exited Employees} / \text{Total Employees}) \times 100.$$

The **30–40** and **40–50** age groups with "Medium" salaries had the highest exits. These findings guide targeted retention efforts, reducing rehiring costs and improving efficiency.
- 2. Salary Comparison:** Heatmaps and bar charts visualized pay gaps by age groups. A heatmap and bar chart indicated that there was a pay gap between ≥ 50 at ₹96,250 and 20–30 at ₹18,684. Using:
$$\text{Average Salary} = \text{Sum of Salaries} / \text{Number of Employees}$$

the overall average was ₹29,625. Addressing these pay gaps can improve retention and reduce rehiring costs.
- 3. Pricing Trends:** Line charts analyzed MRP-to-PTR and PTS-to-PTR ratios for consistency. The chart compares **MRP-to-PTR (R1)** and **PTS-to-PTR (R2)** ratios, where: $R1 = \text{MRP} / \text{PTR}$, $R2 = \text{PTS} / \text{PTR}$. Inconsistencies in these ratios highlight pricing inefficiencies. For example, $R1 > 1.5$ may indicate overpricing, while $R1 < 1.3$ suggests underpricing. This feeds into a dynamic pricing model, where prices will fluctuate relative to demand, competitor pricing, and sales trends in order to balance profitability with market competitiveness.
- 4. Competitive Pricing:** Scatter plots compared Medicare prices against competitors. The chart compares Medicare's MRP with its competitors to find gaps in the pricing: $\Delta \text{MRP} = \text{MRP}(\text{Medicare}) - \text{MRP}(\text{Competitor})$. $\Delta \text{MRP} > 0$ signals overpricing; $\Delta \text{MRP} < 0$ indicates underpricing. Insights guide a dynamic pricing model, adjusting prices based on demand, competitor rates, and sales trends for profitability and competitiveness.
- 5. New Product Trends:** Stacked bar charts displayed launches by composition over time. The graph monitors sales trends of newly launched drug molecules across therapeutic areas, such as Neuro, Diabetic, Cardio, between April and September 2024. Growth is measured in terms of:
$$\text{Growth Rate} = (\text{SalesSep 2024} - \text{SalesApr 2024}) / \text{SalesApr 2024} \times 100$$

This analysis provides emerging market trends and high-demand compositions. Predictive models can even project future sales, thus enhancing R&D prioritization, allowing for faster adaptation to competitor pipelines, and focusing marketing strategies in the right places.
- 6. Pricing Strategy:** Box plots and column chart explored price variability across categories. The column chart shows category-wise average prices, and Support is the highest. The box plots reveal variability, outliers (e.g., CEQ Max), and product-level trends, identifying inconsistencies and pricing gaps. These insights enable optimizing future pricing strategies and adjusting launches for better market competitiveness.

Explanation for Methods used:

Each method was chosen to address specific problem statements effectively after proper analysis and guidance from mentors. Scatter plots enabled easy competitive price analysis, while bar charts identified attrition trends.

5. Results and Findings

Key Findings:

1. Attrition Trends:

High turnover is observed among employees aged 30-50, indicating a need for retention strategies.

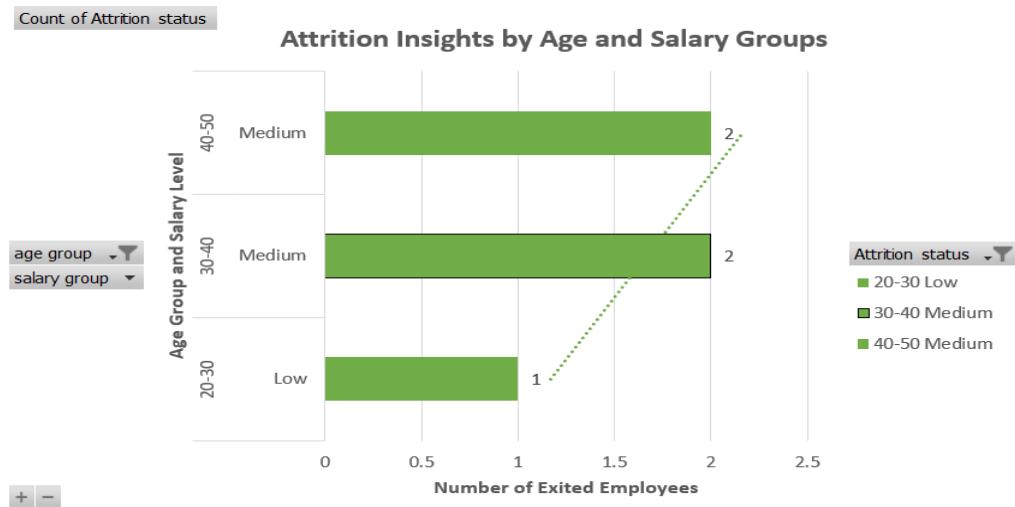


Figure 1: Attrition insights by Age and Salary Groups (Bar chart)

The above chart shows higher attrition in the 30-40 and 40-50 age groups with medium salary levels, suggesting these groups need targeted retention efforts.

2. Salary Disparities:

Younger employees (20-30 years) earn significantly less than older employees, which may impact retention.

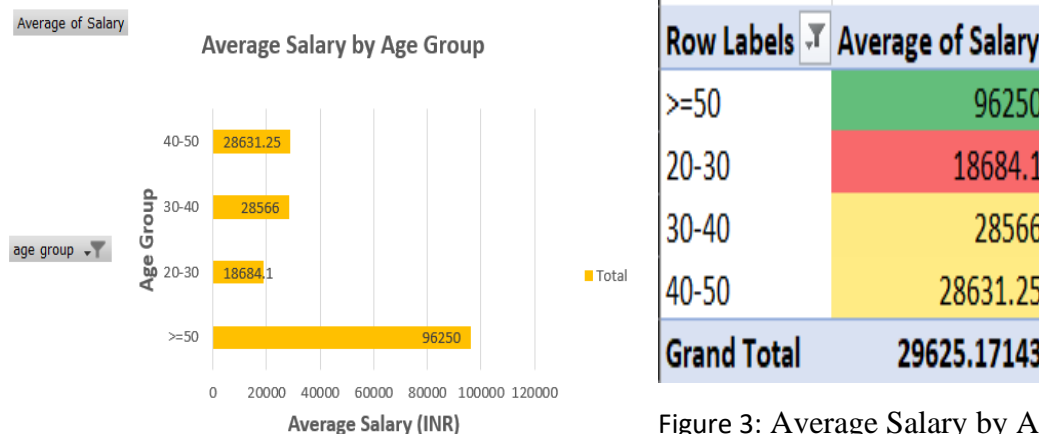


Figure 3: Average Salary by Age Group (Heatmap)

Figure 2: Average Salary by Age Group (Bar chart)

The above charts/images shows that the average salary for the 20-30 age group is INR 18,684.1, much lower than the 30-40 (INR 28,566) and 40-50 (INR 28,631.25) age groups. This disparity suggests that salary adjustments for younger employees could improve retention.

3. Pricing Analysis:

Inconsistent MRP-to-PTR ratios across drugs indicate a need for pricing adjustments to optimize profitability.

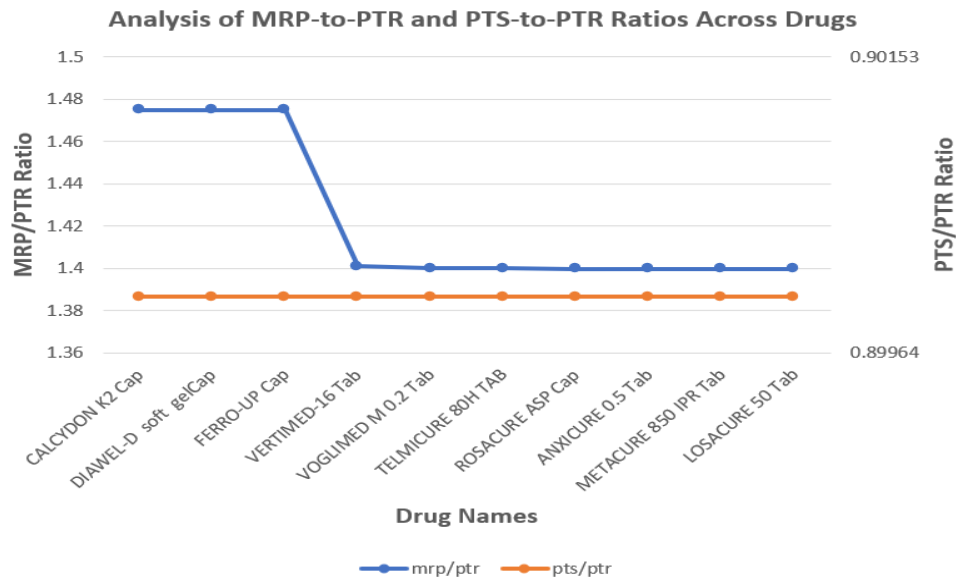


Figure 4: Analysis of MRP/PTR and PTS/PTR Ratios Across Drugs (Line chart)

The above chart shows MRP-to-PTR ratios ranging from 0.90153 to 1.48, indicating pricing inconsistencies that need optimization.

4. Competitive Pricing:

Scatter plots reveal pricing gaps with competitors, suggesting the need to align prices with market standards.

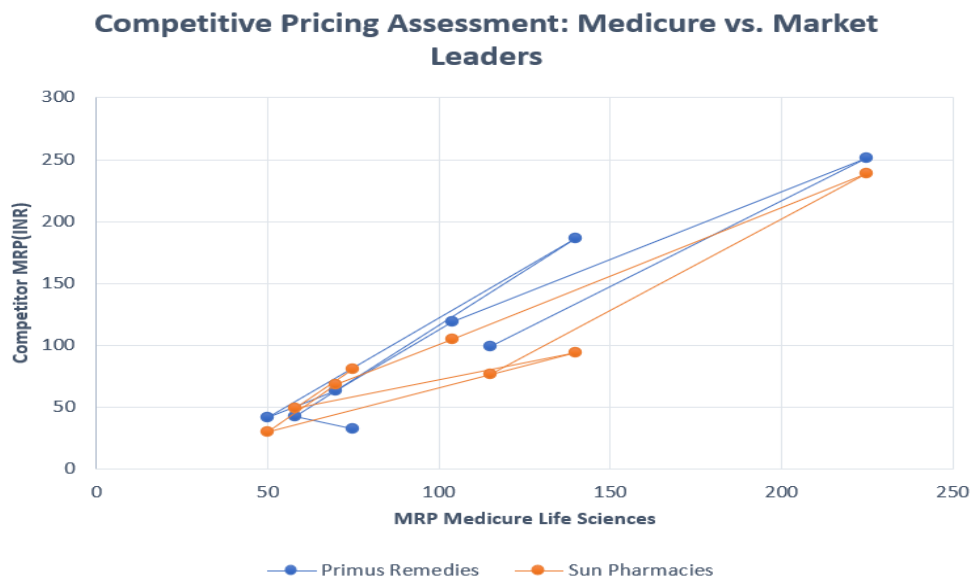


Figure 5: Competitive pricing assessment: Medicure vs. Market leaders (Scatter Plot)

The above scatter plot shows MRP differences between Medicure and competitors, suggesting adjustments to match market standards.

5. New Product Trends:

Cardiology and Diabetic drugs show strong growth, indicating potential for future investments.

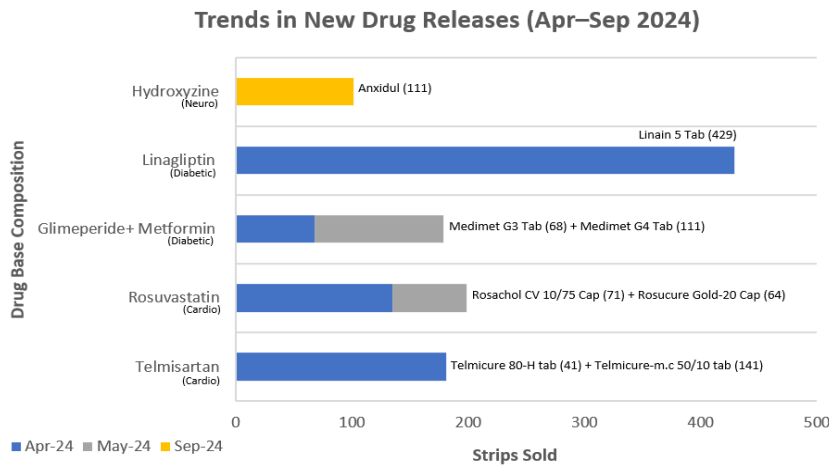


Figure 6: Trends in New drug Releases (apr-sept 2024) (Stacked Bar chart)

The above chart highlights new releases like Linagliptin and Mosuvastatin, indicating promising areas for investment.

6. Price Variability:

The Support category has the highest average prices, while Neuro has the lowest, indicating a need for balanced pricing strategies.

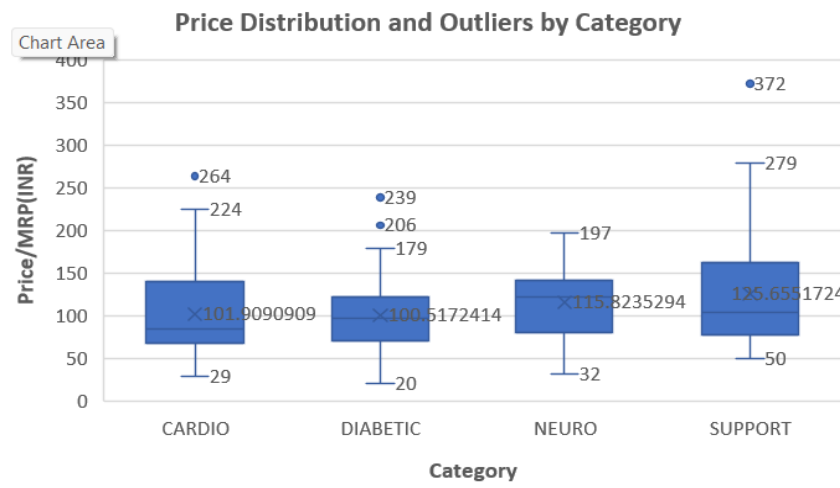


Figure 7: Price distribution and outliers by category (Box Plot)

This shows price distribution, with Support at INR 279 and Neuro at INR 179.

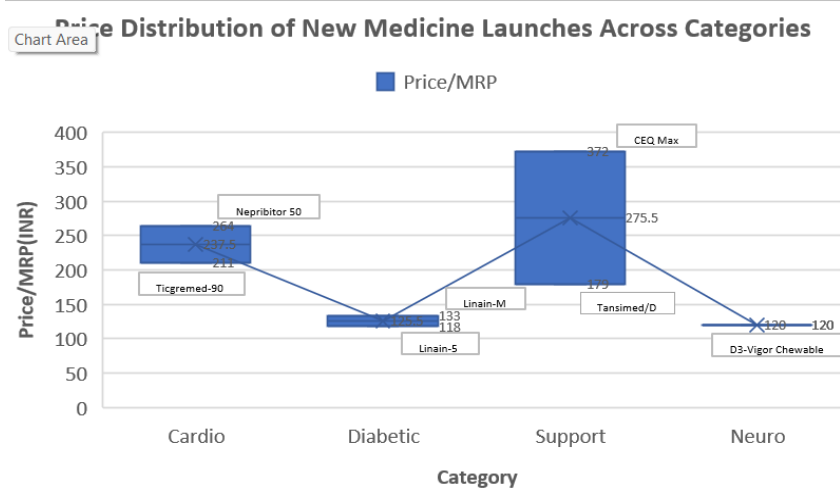


Figure 8: Distribution of new medicine launches across categories (Box Plot)

This highlights the price/MRP across categories, with Support consistently higher.

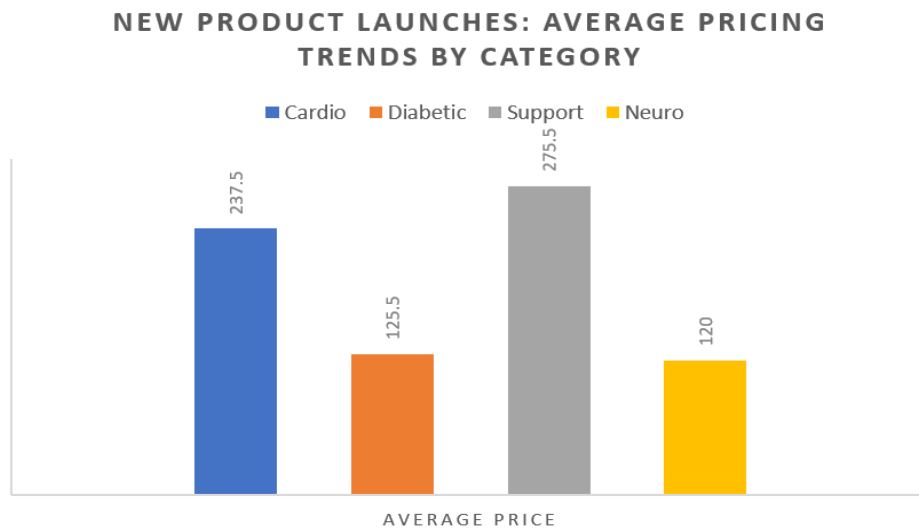


Figure 9: New product launches: Average pricing trends by category (Column chart)

This confirms the average pricing trends, with Support at INR 277.5 and Neuro at INR 120, confirming the need for pricing adjustments.

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