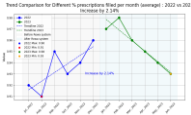


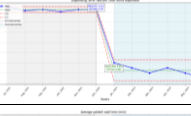
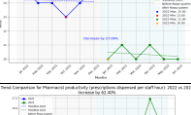
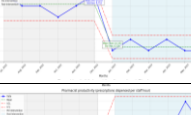

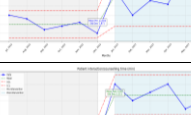




Enhancing Efficiency and Patient Safety through the Implementation of Dispensing Robots in Pharmacy Services

Variables	What It Measures	Data Collection Method	Statistical Measure	Data Type	Analysis Method	Average 2022 (Pre-Robotic)	Average 2022 (Post-Robotic)	Percentage Improvement	Mean Pre-Robotic	Mean Post-Robotic	Std Dev Pre-Robotic	Std Dev Post-Robotic	UCL Pre	LCL Pre	UCL Post	LCL Post	Improvement Chart	Control Chart	Summary	Conclusion
Different % Prescription Filled per Month (Average)	Percentage of prescriptions filled per month	Monthly Rate (%) = $\left( \frac{\text{Prescriptions Filled}}{\text{Total Prescriptions}} \right) \times 100$	Percentage (Average)			0.94	0.96	Increased 2.14%	0.935	0.955	0.019	0.019	0.972417	0.897583	0.992417	0.917583			<b>Trend Comparison:</b> A 2.14% increase in prescription filling from 2022 to 2023 shows improved performance and consistency after the system's implementation.	
Dispensing Error Rate per 1,000 Items Dispensed	Errors per 1,000 items dispensed	Error Rate (per 1,000 Items) = $\left( \frac{\text{Errors}}{\text{Total Items Dispensed}} \right) \times 1,000$	Proportion (Rate)			0.01	0	Decrease by 82.74%	0.014	0.003	0	0.001	0.015082	0.013884	0.004598	0.000402			<b>Trend Comparison:</b> The dispensing error rate per 1,000 items decreased significantly by 82.74% from 2022 to 2023, reflecting the effectiveness of the automated dispensing system.	
Average Patient Wait Time (Minutes)	Average waiting time per patient	Average Patient Wait Time (min) = $\frac{\text{Total Wait Time}}{\text{Total Patients}}$	Average (Mean)			14.17	10.33	Decrease by 27.06%	14.167	10.33	0.753	0.516	15.67221	12.66112	11.36613	9.300538			<b>Trend Comparison:</b> The average patient wait time decreased by 27.06% from 2022 to 2023, showing an improvement in efficiency following the implementation.	
Pharmacist Productivity (Prescriptions Dispensed per Staff Hour)	Prescriptions dispensed per staff hour	Pharmacist Productivity = $\frac{\text{Total Prescriptions}}{\text{Total Staff Hours}}$	Rate (Productivity)			12.5	20.3	Increase by 62.40%	12.5	20.3	1.871	4.171	16.24166	8.758343	28.64266	11.957339			<b>Trend Comparison:</b> Pharmacist productivity increased significantly by 62.40% from 2022 to 2023, indicating enhanced operational efficiency following the system implementation.	
Patient Interaction/Counseling Time (Minutes)	Average counseling time per patient	Average Interaction Time (min) = $\frac{\text{Total Counseling Time}}{\text{Total Patients}}$	Average (Time)			2	6.67	Increase by 233.33%	2	6.667	0.894	1.211	3.788854	0.211146	9.088787	4.244546			<b>Trend Comparison:</b> Patient interaction time increased by 233.33% from 2022 to 2023, demonstrating enhanced patient engagement and service quality post-implementation.	