Operational and patient experience metrics associated with medication adherence in specialty pharmacy

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Background

- Medication nonadherence is associated with poorer health outcomes and increased health care costs. In the specialty pharmacy setting, patients often face barriers such as complex disease states, access constraints, and high out-of-pocket costs.[1]
- While patient-related factors are well-documented, limited evidence exists on how pharmacy operational processes or patient experience measures are associated with adherence.[2]
- This study evaluated a new approach to examine associations between specialty pharmacy operational and experience metrics with specialty medication adherence.

Objective

Evaluate the association of specialty pharmacy operational and experience metrics with medication adherence.

Methods

- **Study design:** Single-center, retrospective, observational cohort study at Optum Specialty Pharmacy between January 1, 2024–July 31, 2025. This study was deemed exempt by UnitedHealth Group Institutional Review Board.
- **Inclusion criteria:** Patients who completed an overall experience survey and had 2 or more medication dispenses during the study period.
- **Data source:** Optum Specialty Pharmacy dispensing system, call center, delivery, digital, patient experience surveys and patient portal data.
- **Statistical analysis:** Operational and patient experience variables were examined using a proprietary AI-enabled network-based exploratory association analysis to identify metrics conditionally associated with adherence, as measured by proportion of days covered (PDC) (Figure 1).
  - Analyses were non-interventional and non-casual
  - A p-value ≤ 0.05 was considered statistically significant

Results

Figure 1: Conceptual framework for examining associations between specialty pharmacy operational and experience metrics and PDC

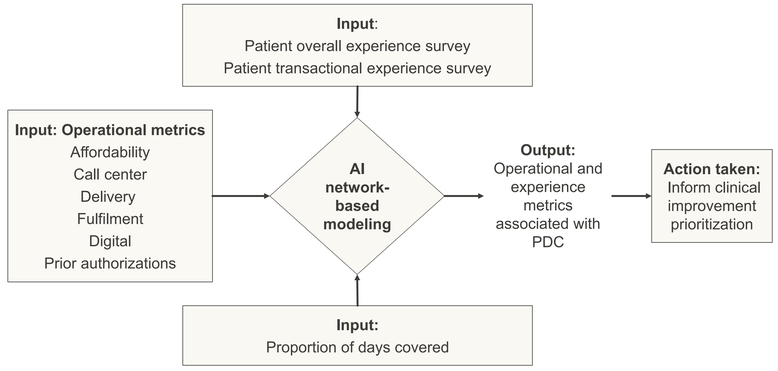

Table 1: Operational and patient experience metrics associated with PDC (N= 9,000)

Domain	Metric association with PDC	*Estimated PDC difference with metric 5% worse	*Estimated PDC difference with metric 5% better
Operational metric			
Call center Interactions	↓	-0.02%	0.01%
Digital interactions	↑	-0.09%	0.09%
Prescription fulfilment time	↓	-0.10%	0.09%
Delivery time	↑	-0.16%	0.05%
Affordability	↑	-0.08%	0.06%
Experience signal			
Feedback — Overall experience	↑	-0.15%	0.15%
Feedback — Digital transaction	↑	-0.02%	0.02%
Feedback — Call transaction	↑	-0.03%	0.02%
Feedback — Delivery transaction	↑	-0.07%	0.07%

*Scenario outputs reflect conditional model estimates and should not be interpreted as causal effects

p<0.05

Discussion

- Several specialty pharmacy operational metrics were statistically associated with PDC. This suggests variation in adherence may be related not only to patient-level factors but also to pharmacy operational performance.
- The AI network-based exploratory association analysis identified call center, digital interaction, prescription fulfillment and delivery-related metrics as having the strongest associations with variation in PDC.
- In the AI network-based scenario analysis, small perturbations in several operational metrics were associated with directional shifts in modeled PDC estimates, despite already high baseline performance.
- Operational metrics may represent candidate metrics for clinical improvement monitoring, leadership decision-making and performance improvement prioritization. These findings support further evaluation of operational performance measures as potential correlation of adherence in specialty pharmacy care.
- The analysis identified several metrics associated with both PDC and overall experience, suggesting overlap in operational touchpoints relevant to both adherence and experience. This may help inform improvement planning through a common set of success metrics (avoid dilution of improvement capacity).
- Based on these findings, future analyses will incorporate gap days metrics as a more proximal adherence measure.

Limitations

- The study was conducted at a single national specialty pharmacy, which may affect generalizability to other pharmacy models or care settings with different operational structures.
- Given the exploratory nature of the analysis and the number of metrics examined, findings should be interpreted as hypothesis-generating.
- The analytic cohort was limited to survey respondents with at least 2 dispenses, which may introduce response/selection bias.

References

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2. Kvarnström K, Westerholm A, Airaksinen M, Liira H. Factors Contributing to Medication Adherence in Patients with a Chronic Condition: A Scoping Review of Qualitative Research. **Pharmaceutics.** 2021;13(7):1100.

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