Digital-Enabled Refills and Medication Adherence among Transplant Recipients

Safia Boghani

Senior Analyst; Health Analytics, Research & Reporting

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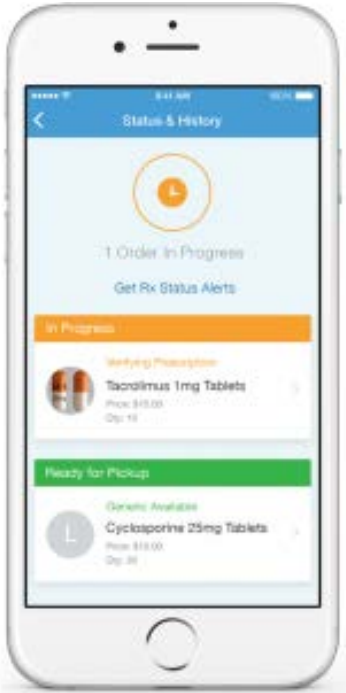
Background

- The effect of nonadherence among transplant recipients has been well documented as a significant contributor of *allograft failure*.[1-3]
- Study shows that adherence of at least 80% can reduce risk of graft loss.[3]
- Digital engagement tools can improve health *outcomes* by providing patients more convenience, flexibility, and functionality at low costs.[4]

1. Lieber SR, Volk ML. Non-adherence and graft failure in adult liver transplant recipients. *Dig Dis Sci.* 2013;58(3):824-834.
2. Mathis AS. Managed care implications of improving long-term outcomes in organ transplantation. *Am J Manag Care.* 2015;21(1 Suppl):s24-30.
3. Spivey CA, Chisholm-Burns MA, Damadzadeh B, Billheimer D. Determining the effect of immunosuppressant adherence on graft failure risk among renal transplant recipients. *Clin Transplant.* 2014;28(1):96-104.
4. Akinbosoye, O, Jiang, J, Taitel, M, Orr G. The Association between Use of a Community Pharmacy's Mobile Pill Reminder App Medication Adherence. Presented at the Society of Behavioral Medicine 37th Annual Meeting, March 30- April 2, 2016, Washington DC.

Objective

To compare medication adherence among transplant recipients who fill their tacrolimus prescriptions over a one-year period using digital methods (app, internet) versus those using more traditional methods (walk-ins, phone) to fill their medications.



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Methods: Study Design

- **Study Design:** Retrospective, observational cohort study
- **Study Population:** Transplant recipients who fill their tacrolimus prescriptions through the internet or on a mobile app versus those who fill through traditional methods
- **Data:** Walgreens pharmacy claims data 2013-2016
- **Inclusion Criteria:** Age ≥ 18, 2+ tacrolimus prescription fills, first and last fill for year ≥ 150 days apart[1]

1. Pharmacy Quality Alliance. Technical Specifications for PQA Approved Measures. Available at http://www.nbch.org/nbch/files/ccLibraryFiles/Filename/000000003537/1_July2014_PQA%20Measure%20Manual.pdf. Accessed April 21st, 2017

Methods: Statistical Plan

- **Statistical method:** Logistic regression model
- **Independent variable:** Digital patient (≥50% fills digital)
- **Covariates:** Age group, gender, payer, number of comorbidities, drug copay, use of transplant specialized pharmacy, and use of brand medications

Primary Outcome: Medication Adherence

- **Proportion of Days Covered (PDC)**

The proportion of days in the measurement period "covered" by prescription claims for the same time period. [1]

$$PDC = \left(\frac{\text{Number of days in period "covered"}}{\text{Number of days in period}} \right) \times 100\%$$

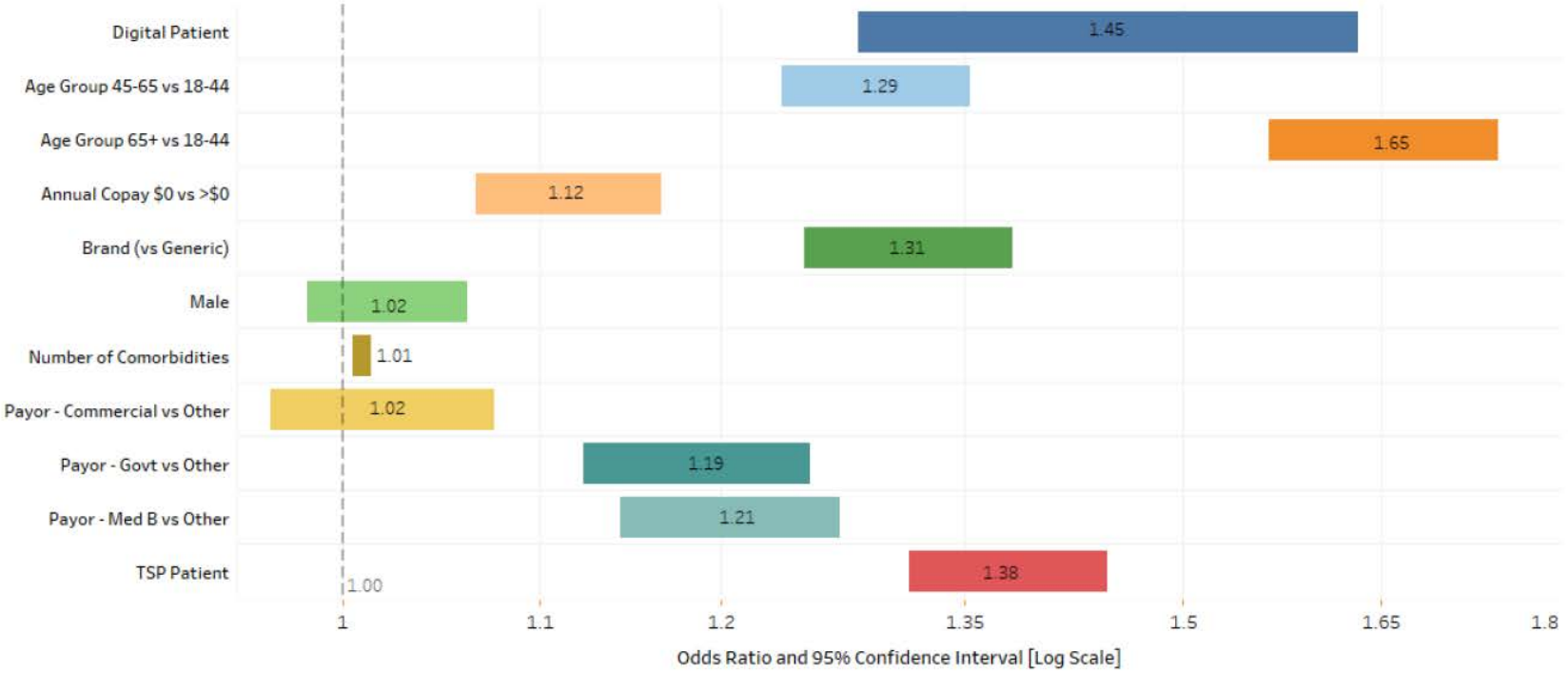
- **Patients were categorized as "adherent" if their PDC ≥ 80%.**

1.Nau DP. Proportion of days covered (PDC) as a preferred method of measuring medication adherence. Available at http://pqaalliance.org/resources/adherence.asp. Accessed April 19th, 2017.

Demographics of study population

- Non-digital refill behavior (97%)
- Male (58%)
- 45-64 years (49%)
- Filled generic medications (76%)
- Payer – Med B (29%)

Use of digital methods significantly increased the odds of being adherent to immunosuppressants.



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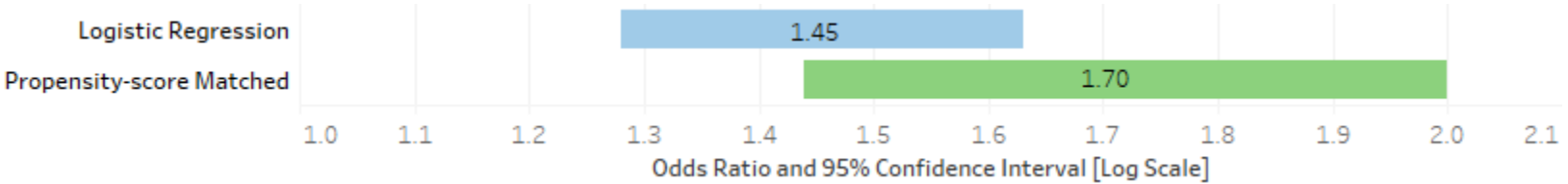
Propensity-score matching resulted in a similar effect size for digital methods on adherence.

- Propensity-score matching
- 1,166 matched pairs
- OR: 1.70 (95% C.I. 1.44-2.00)



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Limitations + Conclusion

Limitations

- Observational design
- Reliance on administrative data from one pharmacy chain
- Limited to one immunosuppressant (tacrolimus)

Conclusion

- Transplant recipients who use digital methods to fill their prescriptions were **more adherent** than those whose use traditional methods to fill their prescriptions.