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Utilization of a Mobile Pill Reminder Application is Associated with Higher Medication Adherence

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Mobile pill reminder users had significantly higher medication adherence

RESEARCH OBJECTIVE

- To examine the association between mobile pill reminder app use and adherence to hypertension, hyperlipidemia, and oral diabetes medications.

STUDY DESIGN

- Medication non-adherence is a common problem often leading to the worsening of chronic conditions, increased hospitalizations, and higher medical costs.^{1,2}
- With daily use of mobile technologies now commonplace, digitally-delivered tools for managing medication adherence are an increasingly viable option.
- We conducted a retrospective study to analyze the medication adherence of patients using a free pill reminder app compared to non-users.
- Adherence was measured as the 12-month proportion of days covered (PDC = days covered / days in measurement period) from the first fill during an index period (July, 2017 through November, 2017), and percent of patients with optimal adherence (PDC≥80%).
- The difference in likelihood for optimal adherence was calculated using a log binomial regression model adjusted for sociodemographic covariates and interaction terms. Included covariates with chi-squared $p < 0.10$ were age, gender, payer, mean number of prescriptions, mean copay, 90-day indicator, and census zip code-level income. Resulting relative risks were deemed significant if chi-squared $p < 0.005$.
- Propensity score matching was also used to generate two similar groups, based on sociodemographic covariates in a logistic regression, in order to compare adherence measures between groups. Student's t-tests were used to assess the statistical significance ($p < 0.005$) of the differences between adherence among app- and non- users.

POPULATION STUDIED

- Participants were patients of a national pharmacy chain 18 years and older with ≥2 prescription fills for hypertension, hyperlipidemia, or oral diabetes medications during the 12-month study period.
- All patients using the pill reminder app and a 10% random sample of non-users by medication class were included.

PRINCIPAL FINDINGS

- 60,006 app-users and 890,224 non-users were included in the analysis.
- Overall, those who used the pill reminder were younger (53.6 vs 62.8 years old), more likely to be female (53.5% vs 49.6%) and lived in a wealthier zip code with a higher percentage white population.
- Compared to non-app users, app-users had fewer patients with Medicare Part D insurance and 90-day prescriptions.
- The adjusted log binomial models found that patients using the pill reminder app were more likely to have optimal adherence compared to non-users ($p < 0.0001$); 5.5% more likely for patients taking hypertension, 5.0% for hyperlipidemia, and 10.3% for oral diabetes medications.
- Propensity score matched groups revealed a significantly higher mean PDC for each drug group (between 0.023 and 0.042 percentage point difference, $p < 0.0001$) and a higher percentage of optimally adherent patients: 0.053 percentage points higher for hypertension, 0.048 for hyperlipidemia, and 0.077 for diabetes ($p < 0.0001$) among app-users compared to non-users (Figures 1 and 2).
- The association between app use and adherence remained significantly positive across insurance types; the difference between app-users and non-users was higher for Medicaid compared to commercial and Medicare D patients (Table 1).

Figure 1: Difference in optimally adherent patients comparing app-users to non-users*

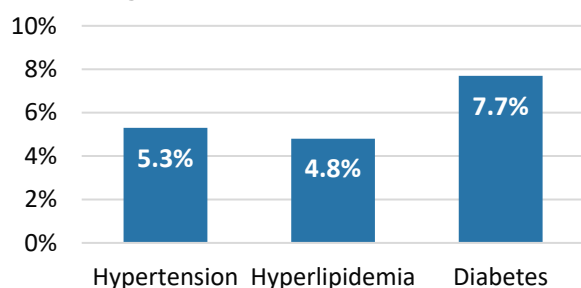


Figure 2: Difference in mean PDC comparing app-users to non-users*

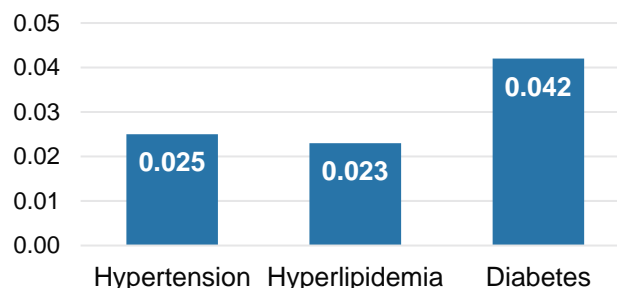


Table 1: Difference in adherence comparing app-users to non-users* by payer type

	Commercial	Medicare Part D	Medicaid
Optimal PDC (%) Difference			
Hypertension	5.3	3.7	9.4
Hyperlipidemia	4.9	3.7	8.9
Diabetes	7.4	7.7	11.0
Mean PDC Difference			
Hypertension	0.026	0.017	0.050
Hyperlipidemia	0.024	0.016	0.043
Diabetes	0.040	0.037	0.060

CONCLUSIONS AND IMPLICATIONS

- Patients who used the pill reminder app had significantly higher adherence rates and were significantly more likely to achieve optimal adherence.
- The mobile pill reminder app is a helpful tool that pharmacies should promote to increase medication adherence.

References:

1. Marcum, Z. A., Sevick, M. A., & Handler, S. M. (2013). Medication nonadherence: a diagnosable and treatable medical condition. *JAMA*, 309(20), 2105-2106.
2. Watanabe, J. H., McInnis, T., & Hirsch, J. D. (2018). Cost of prescription drug-related morbidity and mortality. *Annals of Pharmacotherapy*, 52(9), 829-837.

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