The Impact of Enhanced Two-Way Text Services and Digital Services on Adherence in the Rare Disease Population

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Background

Medication adherence is critical for improving morbidity and mortality of patients with chronic diseases with the average rate of non-adherence being 24.5%.[1] Non-adherence is a multifactorial problem that goes beyond forgetting to take their dose. Reducing patient burden by simplifying certain processes can assist them to maintain consistent medication-taking behaviors, often starting by making sure they receive refills in a timely fashion. Data has shown that frequent two-way text messaging has improved adherence in patients significantly, especially in a high-risk population.[2] A study reviewing the impact of text messaging programs on oral medication adherence used proportion of days covered (PDC) to analyze adherence. The results showed a PDC of 0.85 in the text message opt-in group compared to 0.77 in the control group ($p< 0.001$) resulting in significant increase in medication filling behavior when opting into the text messaging program.[2] Although studies have been conducted to review patient medication adherence when using a text messaging service, the study populations have been those with large prevalence rates such as diabetes, asthma, cardiovascular disease, etc. There is a lack of information on the impact on medication adherence in the rare disease space.[3]

Objective

To assess medication adherence in a rare disease population using text messaging refill services versus phone refills.

Methods

A single pharmacy retrospective database analysis is performed with the goal of assessing patient medication adherence. The study population consists of patients receiving medications from various rare disease populations. Patients included in the text refill cohort must have completed at least two refills via text. Patients in the phones only refills cohort included patients who have not opted into the text service but have completed at least two refills via phone. Data is collected for patients starting at two months from the initial launch dates of the implemented text messaging services and lasting the duration of a year.

Medication adherence is compared through the assessment of average gap days in refills completed in the opt-in population (refills by text or phone if needed) versus the opt-out population (refill by phone only). Additional analysis completed based on age group, and insurance delays, and the type of text messaging services received (electronic portal linked text services versus an SMS refill service). One-tailed t-test statistical analysis is used to determine the significance between refill services offered. Correlation analysis is determined through the Pearson's Product-Moment Correlation Test.

Results

Figure 1: Demographic Data By Sex

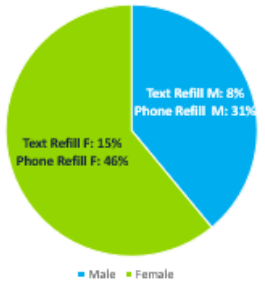

Figure 2: Demographic Data By Age

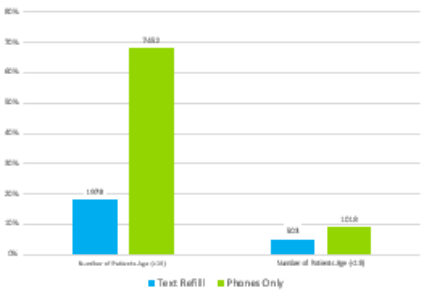

Table 1: Average Gap Days in Text Refill Versus Phone Only Refill Cohorts

	Average Gap Days Text Refill (n= 2,481)	Average Gap Days Phone Refill (n= 8,470)	p Value
Adults (≥18 years) (n= 9,430)	1.36	2.41	p<0.001
Pediatrics (<18 years) (n= 1,521)	0.55	1.81	p<0.001

Table 2: Complete Adverse Event Reports and Reactive Pharmacist Counseling Occurring Outside Scheduled Call Cadence in Text Refill versus Phone Only Cohorts

	% Adverse Event Reported	% Reactive Pharmacist Counseling Completed
Text Refill (n=2,481)	23.82	1.53
Phone Refill (n=8,470)	32.94	2.34
p Value	p <0.001	p=0.01

Table 3: Average Gap Days within the Text Refill Cohort Only*‡

	Average Gap Days Fill through Text Refill	Average Gap Days Fill through Phone Refill	p Value
All Ages (n=2,481)	0.52	1.64	p<0.001
Adults (≥18 years) (n=1,978)	0.62	1.86	p<0.001
Pediatrics (<18 years) (n=503)	0.19	0.82	p<0.001

*This sub-analysis describes the population opted into the texting refill service. Patients included in the text refill cohort have the option to refill medications via phone if needed. The analysis is done to observe the difference in gap days of the same patient when using either of the two services to complete a refill.

Age analysis in the adult population revealed statistical significance (p<0.001) between the median age of the text refill cohort (48) and median age of the phone refill cohort (54)

Discussion

This study evaluated 10,951 patients with 2,481 subjects included in the text refill cohort and 8,470 included in the phone refill cohort. Female population made up 61% of the total study population. The primary outcome reviewed for this study showed statistical significance in the number of gap days in the text refill cohort versus the phones only cohort across all ages with a p<0.001. An analysis of patients in the adult (≥18) category and the pediatric category was also statistically significant with a p<0.001. (Table 1) Adverse event reporting and counseling occurring outside scheduled call cadence was significantly lower in the patient-initiated outreach in the text refill cohort. (Table 2)

A sub-analysis of the text refill only cohort was conducted. Patients in this cohort were included if they have refilled through the text refill system for at least 2 refills. Patients in this cohort have the option to refill via the phone if needed. The sub-analysis of gap days shows to be significant with the text refill across all ages having 0.52 gap days versus 1.64 gap days for the phone refills (p<0.001). Statistical significance was shown in individual adults and pediatrics populations within this analysis. (Table 3)

Data analysis also shows that there may be a preference for text refill messaging services in patients less than 50 years of age. However, the study was not powered to measure preference by age. The analyzed data revealed no correlation of insurance related problems impacting the gap days data. The SMS refill data was not analyzed because the included patients in the study did not utilize that texting service.

A limitation noted was a meaningful variance in gap days in the phone refill services cohort in comparison to the text refill. This is due to the differences in how the services work and the call back time of patients when refilling through the phone.

Conclusion

In caring for patients with complex diseases, it is important for rare disease pharmacies to provide them with tools to improve treatment adherence. The study results suggest that patients opting into electronic text refill services have higher medication adherence, which could result in improved patient outcomes. Reduced adverse event reporting and counseling occurring outside scheduled call cadence requested by patients may be influenced by opting in to the texting service. The extent of this impact and methods to engage with these patients need to be further considered. In addition, study analysis suggests age of patient or caregiver may play a factor in the type of refill service selected.

References

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