

RESEARCH ARTICLE

EVALUATION OF CLINICAL NO-SHOW RATES IN THE SETTING OF AN OUTPATIENT INTERNAL MEDICINE RESIDENCY CLINIC

Michael P. Soos, DO¹; Alexander Cobb, DO¹; Parag Patel, DO¹; Hemalata Mandiga, DO¹; Amit Ghose, MD¹; Shane Clark, DO¹

¹ McLaren Greater Lansing, Lansing, MI

KEYWORDS:

Cancellations

No-Show

Outpatient
Medicine

Practice
Management

Telephone
Reminder

ABSTRACT: A no-show appointment is clinically defined as a scheduled appointment in which a patient fails to attend without prior notification to the provider or staff. In primary care clinics, no-show rates have been shown to range from 15% to 30%. Smaller studies have shown that interventions including phone calls, emails or text message reminders can reduce no-show rates.¹⁻⁹ Our retrospective review sought to evaluate a similar intervention performed at the Multispecialty Residency Clinic (MSC). A test of two proportions was performed to evaluate the effect of a 24-hour reminder phone call. The no-show rate before initiating a 24-hour phone call was 17.8%, and following the intervention this rate improved to 16%, an observed reduction of 1.9% with a 95% confidence interval (CI) from 0.1% to 3%, $p = 0.003$. New patient encounters, established patient visits and cancellations were analyzed as secondary endpoints to further evaluate the effects of a reminder phone call. Our retrospective analysis is the largest to date regarding the effectiveness of utilizing phone call reminders to reduce no-show rates in the setting of a residency clinic and has confirmed a significant 2% reduction in no-show appointments.

INTRODUCTION

A no-show appointment is clinically defined as a scheduled appointment in which a patient fails to attend without prior notification to the provider or office staff. In practice, no-shows often lead to poor continuity for patients and result in a loss of profitability for providers, medical groups and corporations.² In 2014, the study "Estimating the Cost of No-Shows and Evaluating the Effects of Mitigation Strategies" found that with office schedules based around 24 patient encounters per day, the daily loss of income due to no-shows could be as high as \$1,019.29 per provider, or approximately 23.0%. In a medical training environment, these effects are compounded by a loss of an invaluable opportunity for education and experience.

Studies have demonstrated no-show rates ranging between 15% to 30% and in some extreme cases have reported no-show rates as high as 50% in a primary care setting and 60% in mental health clinics.³⁻⁶ Smaller studies have shown that interventions including phone calls, emails or text message reminders have led

to improvement in no-show rates.⁷⁻¹¹ In one study, "Effectiveness of Telephone Reminders in Improving Rate of Appointments Kept at an Outpatient Clinic," a family medicine residency clinic performed a randomized control trial with an intervention of calling patients one day before their appointment: 479 patients were placed in the intervention and 424 in the control group. Their study revealed a reduction of no-show rates from 26% to 19% in the intervention group, which was accompanied by a concurrent increasing rate of cancellation.³ Another study performed in Veterans Affairs (VA) clinics compared reminder phone calls at 24 hours, 48 hours and 72 hours prior to appointments.⁹ Results revealed a benefit in the 24- and 48-hour group over the 72-hour group.⁹

In February 2018, the MSC committee implemented a policy in which Medical Assistants (MAs) notified patients with a telephone call 24 hours prior to their scheduled appointment. The MSC is an urban ambulatory care center focused on resident education in the primary care setting. Our retrospective review of more than 17,000 patient encounters is the largest to date and sought to evaluate the effects of a 24-hour reminder phone call on clinical no-show rates.

CORRESPONDENCE:

Michael P. Soos, DO | Michael.Soos@mclaren.org

METHODS

Study Population

A retrospective analysis was performed on clinical data ranging from February 2015 to February 2019. Analyzed data included the numbers of no-show visits, cancellations, established patient visits and new patient encounters. Appointment rates before and after an intervention consisting of a 24-hour reminder phone call were compared for significance. Prior to the intervention there were a total of 13,373 visits with an additional 4,357 visits in the following year. Encounters evaluated in this study include appointments scheduled at the MSC. The patient population consists of approximately 50–60% Medicare and Medicaid patients.

Study Design

This was an empirical interventional study used to estimate the causal impact of an intervention on a target population without random assignment. In February 2019, a retrospective study was initiated to evaluate the effects of an intervention in which clinical staff would provide a telephone reminder to each patient 24 hours prior to their scheduled appointment. If the patient could not be reached by phone during regular business hours, a voicemail was left to remind patients about their scheduled appointment. Clinical data collected from February 2015–February 2019 included the numbers of appointments scheduled, cancellations, no-shows, established visits and new patient encounters. No-show rates were calculated by dividing the number of no-shows by the number of expected visits. This was done in both the control group from February 2015–February 2018 and the intervention group from February 2018–2019. Before intervention there were a total of 13,061 expected visits and a calculated 18% of no-shows. The null

hypothesis was established as “calling patients 24 hours before scheduled appointments will have no effect on improving no-show rates.” The alternative hypothesis was established as “calling patients 24 hours before scheduled appointments will decrease no-show rates.” A test of two proportions (comparing the no-show rates before and after intervention) was done using Minitab 18.1 (Minitab LLC, State College, PA) with a CI of 95% and an alpha of 0.05. P-values were used to determine the significance of the study. A subgroup analysis was also performed between different populations before and after the intervention. This included the rate of cancellations, the rate of cancellations plus no-shows, the established patient visit rate and the new patient visit rate was analyzed between the non-intervention group and the intervention groups.

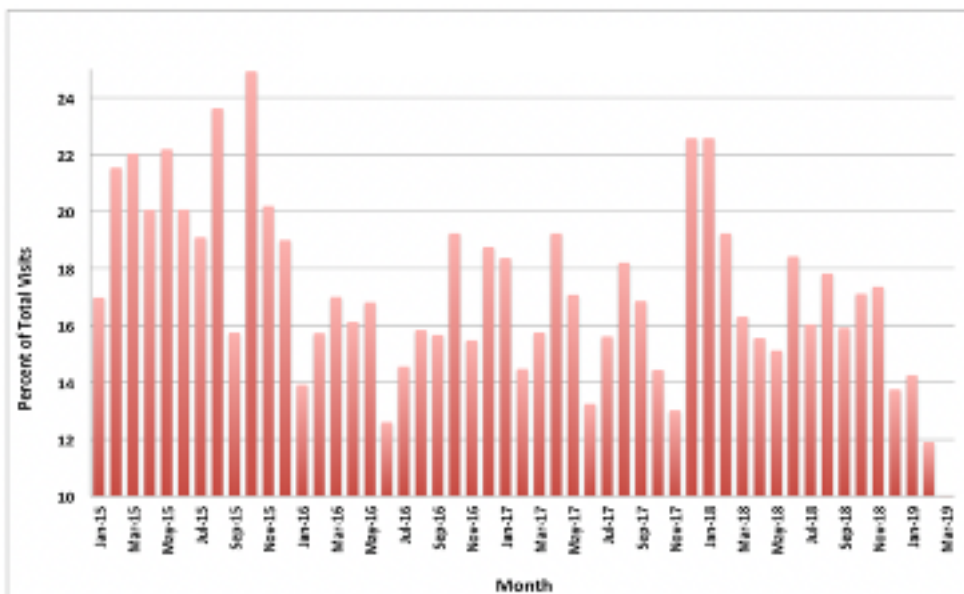
RESULTS

No-Shows

The no-show rate prior to initiating a telephone reminder was 17.8%, which improved to 16% with intervention (Figure 1). The observed reduction in no-show rates with a 24-hour reminder call was 1.8% with a 95% confidence interval (CI) from 0.1% to 3%. This was determined to be a statistically significant difference with a p-value of 0.003.

FIGURE 1:

No-show visit rates by month showing modest reduction in no-show rates following 24-hour telephone reminder in February 2018.



Cancellations

The cancellation rate prior to initiating a telephone reminder was 7.0%, which increased to 9.9% following intervention (Figure 2). The observed increase in the cancellation rate with a 24-hour reminder call was 2.9% with a 95% CI from -3.9% to -1.9%. This was a statistically significant difference with a p-value < 0.001.

Established Patient Visit Rates

The established patient visit rate prior to initiating the telephone reminder was 66.7%, which increased to 68.8% following intervention (Figure 3). The observed increase in the established patient visit rate was 2.1% with a 95% CI from -3.7% to -0.1%, which was a statistically significant difference with a p-value of 0.008.

FIGURE 2:

Cancellation rates by month showing a marked increase in cancellation rates with a 24-hour telephone reminder.

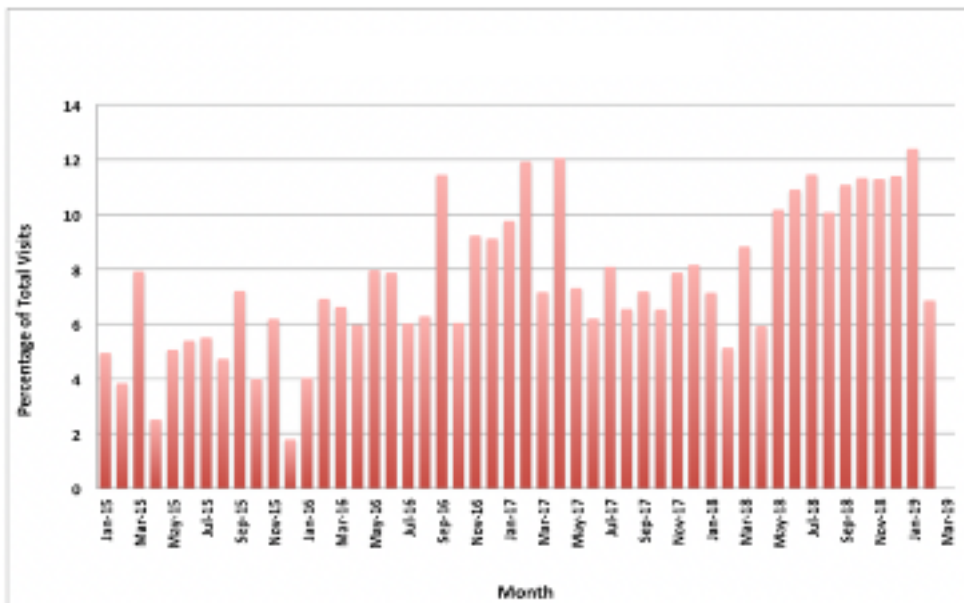
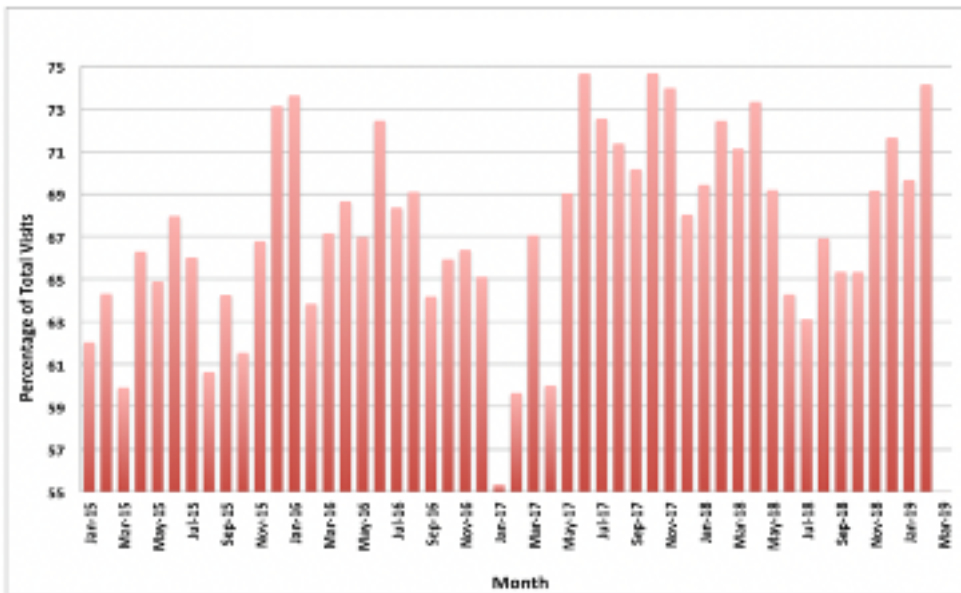


FIGURE 3:

Established patient visit rates by month showing a modest increase following 24-hour telephone reminder in February 2018.

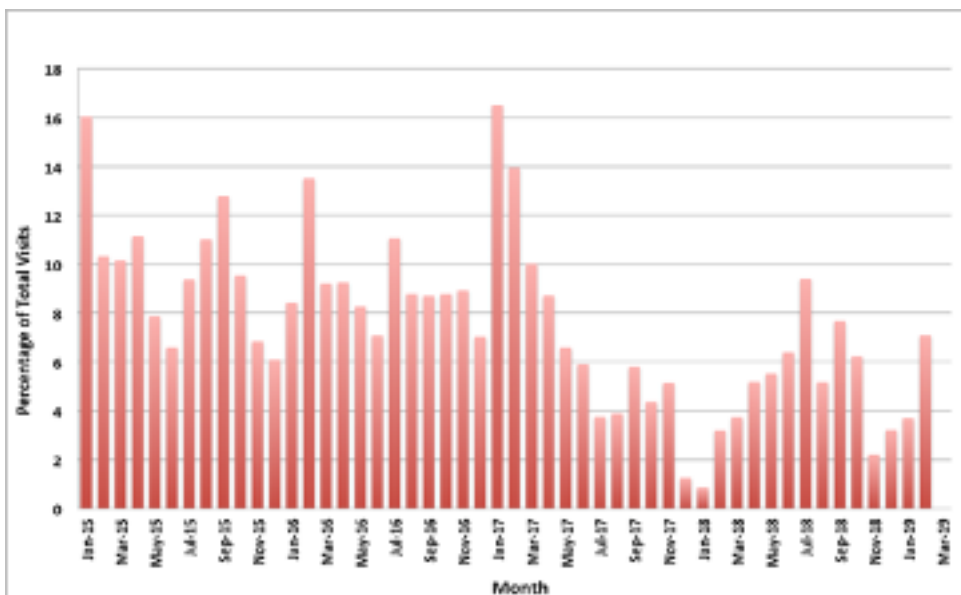


New Patient Visit Rates

The new patient visit rate prior to initiating a telephone reminder was 8.5%, which decreased to 5.4% following the intervention (Figure 4). The observed decrease in the new patient visit rate was 3.2% with a 95% CI from -2.4% to 4.0%. This was determined to be a statistically significant difference with a p-value < 0.001.

FIGURE 4:

New patient visit rates by month showing a marked reduction in new patient visits following 24-hour telephone reminder.



DISCUSSION

Clinical no-shows are often a source of poor continuity for patients, a loss of profitability for providers and in a medical training environment, a loss of an invaluable opportunity for education and experience for residents. Many prior studies have indicated that no-show rates in the primary care setting have ranged from 15–30% and can be as high as 50% in some cases.^{2–12} This data exemplifies the need for interventions to improve patient attendance and compliance. Our single-center retrospective large-scale study was performed at a multispecialty ambulatory care center primarily focusing on resident education. We evaluated the effects of a 24-hour telephone reminder on no-show visit, cancellation, established patient visits and new patient encounter rates. Our study spanned a timeframe of four years and utilized data collected on more than 17,000 patient encounters.

Our findings were consistent with prior studies in which a 24-hour phone call resulted in a reduction of clinical no-shows; however, the reduction was much more modest than that which has been previously established. Previous smaller studies have shown reductions in no-show rates to be as high as 7%,² but our retrospective analysis reveals a reduction that appears to be much lower, approximately 1.8% (Figure 1). We believe that these results better approximate the effects of such an intervention in true clinical practice because of the volume of patient encounters encompassed during our study.

Our results further mirrored that of prior studies in that cancellation rates increased with the 24-hour phone call reminder, from 7.0% to 9.9% (Figure 2). This 2.9% increase had a 95% CI from -3.9% to -1.9%, (-0.0386, -0.0194) and was found to be statistically significant with a *p*-value < 0.001. This increase in cancellation rate may have occurred due to two mechanisms. First, by notifying patients 24 hours before a scheduled appointment the opportunity for cancellation was made readily available. Second, we believe that part of our increased cancellation rate could be directly associated with the reduction in the no-show rates as patients who had planned to miss their appointment without notification and those who had forgotten their scheduled appointment were given an opportunity to cancel their visit. The combined cancellation and no-show rate was found to increase by 1%, increasing from 24.8% to 25.8%. This was found to have a 95% CI ranging from -2.5% to 0.4% (-0.0251, 0.0041) and found to be not statistically significant with a *p*-value of 0.150.

In further analysis, our study also found an increase in the established patient visit rate of 2.1% (Figure 3), increasing from 66.7% to 68.8%. This was found to have a 95% CI from -3.7% to -0.1% (-0.0367, -0.0056) and was found to be statistically significant with a *p*-value of 0.008. This increase in established patient visits mirrored the reduction in no-show rates. We suspect that this correlation occurred because as cancellations made appointment slots available, clinic staff could utilize the openings in the schedule for same-day sick or follow-up appointments as established patient visits. Our study also found a 3.2% decrease in the new patient visit rate with this intervention (Figure 4). Prior to the intervention, the new patient visit rate was 8.5% and decreased to 5.4% with a 95% CI from -2.4% to 4.0% (0.0236, 0.0397). This was a statistically significant difference with *p* < 0.001. We believe that this reduction

may be multifactorial in nature and suspect that the reduction may not be solely related to our 24-hour phone call reminder policy. In October 2017, new opioid policies were initiated in the MSC in response to the opioid epidemic that resulted in established patients undergoing significant opioid weans. Additionally, new patients were informed prior to their scheduled appointments that chronic opioids would be continued at the discretion of their physician and may potentially not be continued at their current doses. Unfortunately, we were unable to identify which appointments were associated with patients on chronic opioids and those undergoing medication weans. Lastly, in December 2017 the MSC was moved to a new location, which resulted in an increase in late arrivals or missed appointments; however, missed appointments associated with moving the clinic were not recorded.

During our analysis, we registered additional weaknesses associated with our study. We found that in clinical practice attempts to notify patients of an upcoming appointment with a 24-hour phone call can often fail due to incorrect contact information or the inability to contact a patient, requiring a voicemail to be left. Unfortunately, as this was a real-world retrospective analysis of appointment data, we were unable to evaluate or track phone calls and associated appointments in which a voicemail message was recorded as opposed to a direct conversation. As noted above, we were unable to discern the effects that changing opioid policies and moving to a new location may have had on our clinical visit rates. One previous study in the Detroit metro area evaluated potential causes for those patients who did not show up to their appointments in the otolaryngology department in the Henry Ford Health System.¹³ It was determined that younger, Black and low-income patients are significantly related to patient non-compliance with clinic appointments.¹³ It was also found that location of the appointment and means of transportation had an effect on no-show rates.¹³ We did not perform subgroup analysis looking into our patient population age, ethnicity, means of transportation or socioeconomic status that may have impacted our results. Regardless of these weaknesses, we believe that the strength of our retrospective study lies in the breadth of visits encompassed in our analysis as well as the period of time spanned. To date we have been unable to find an equivalent study spanning such a period of time or encompassing the number of patient encounters present in our analysis. We believe that while some weaknesses may be present, this study represents the flow of a clinic in true practice and as a result is a better representation of such interventions than previously reported studies.

In the future, we plan to continue our investigation of the effects of various interventions on patient encounters. In Denver Health's 21st Century Care program, a before and after analysis compared no-show rates, attendance rates, cancellation rates and patient satisfaction scores with patients who opted into text message reminders to those who declined text message reminders. It was determined that the cancellation and no-show rates were lower, the attendance rate higher, and the patient satisfaction scores were higher in those patients who received text message reminders.¹⁴ Based on this study and previous studies showing the impact of SMS messaging on no-show rates, it would be beneficial to try to incorporate SMS messaging to outpatient clinic patients.^{15–16} Another study suggests that two of the top three given reasons

for missing appointments are forgetfulness and confusion over appointment time, date or location. It was also determined that patients tend to prefer a single reminder versus multiple reminders within two weeks of their scheduled appointment.¹⁷ Current purposed interventions include use of business cards at the point of hospital or emergency room discharge to increase new patient encounters in the clinic, and the use of text messaging in addition to a 24-hour phone call reminder to notify patients of existing appointments.

CONCLUSION

This is a single-center retrospective large-scale study in which we evaluated the effects of a 24-hour telephone reminder on no-show visit, cancellation, established patient visit and new patient encounter rates. The MSC is an urban ambulatory care center focused on resident education in the primary care setting. Our study spanned a timeframe of four years and utilized data collected on more than 17,000 patient encounters. Our study was the largest single-center retrospective study to evaluate clinical no-show rates with an intervention of a phone call to patients prior to their appointment. Similar smaller studies showed reduction in no-show rates. However, we believe that our results better approximate the effects of such an intervention in true clinical practice given the large scale of patient encounters. Our study shows a statistically significant reduction in no-show rates with just a simple phone call. Decreasing the no-show rates in an ambulatory clinic will not only reduce loss of wasted time and reimbursement, but it will also provide greater opportunity to improve preventative medicine within a community. Something as simple as a phone call can help encourage patients to attend their next appointment and give them a chance to obtain the medical care that they need. Further potential studies would try to correlate decrease in no-show rates with hospitalization rates and incorporation of SMS reminders.

AUTHOR DISCLOSURES:

The author(s) declare no relevant financial affiliations or conflicts of interest.

IRB STATEMENT:

Our study received Non-Human Determination through McLaren IRB. A formal copy of the Non-Human Determination may be provided at request.

REFERENCES:

1. Molfenter T. Reducing appointment no-shows: going from theory to practice. *Subst Use Misuse*. 2013;48(9):743–749. doi:10.3109/10826084.2013.787098
2. Berg BP, Murr M, Chermak D, et al. Estimating the cost of no-shows and evaluating the effects of mitigation strategies. *Med Decis Making*. 2013;33(8):976–985. doi:10.1177/0272989X13478194
3. Hashim MJ, Franks P, Fiscella K. Effectiveness of telephone reminders in improving rate of appointments kept at an outpatient clinic: a randomized controlled trial. *J Am Board Fam Pract*. 2001;14(3):193–19.
4. Hixon AL, Chapman RW, Nuovo J. Failure to keep clinic appointments: implications for residency education and productivity. *Fam Med*. 1999;31:627–30.
5. George A, Rubin G. Non-attendance in general practice: a systematic review and its implications for access to primary health care. *Fam Pract*. 2003;20(2):178–84.
6. Lacy NL, Paulman A, Reuter MD, Lovejoy B. Why we don't come: patient perceptions on no-shows. *Ann Fam Med*. 2004;2(6):541–5.
7. Shah SJ, Cronin P, Hong CS, Hwang AS, Ashburner JM, Bearnot BI, et al. Targeted reminder phone calls to patients at high risk of no-show for primary care appointment: a randomized trial. *J Gen Intern Med*. 2016;31:1460–6.
8. Smoller JW, McLean RY, Otto MW, Pollack MH: How do clinicians respond to patients who miss appointments? *J Clin Psychiatry*. 1998;59(6):330–8.
9. Goffman RM, Harris SL, May JH, Milicevic AS, Monte RJ, Myaskovsky L, Rodriguez KL, Tjader YC, Vargas DL. Modeling Patient No-Show History and Predicting Future Outpatient Appointment Behavior in the Veterans Health Administration. *Military Medicine*. 2017;182(5–6):e1708–e1714. <https://doi-org.lmunet.idm.oclc.org/10.7205/MILMED-D-16-00345>. Accessed Nov 9 2019 .
10. Kaplan-Lewis, E, Percac-Lima, S. No-Show to Primary Care Appointments: Why Patients Do Not Come. *JPrim Care Community Health*. 2013;251–255. <https://doi.org/10.1177/2150131913498513> :1-1
11. Guy R., Hocking J., Wand H., Stott S., Ali H., Kaldor J. How effective are short message service reminders at increasing clinic attendance? A meta-analysis and systematic review. *Health Serv. Res*. 2012;47:614–632. doi:10.1111/j.1475-6773.2011.01342.x.12.
12. Parikh A1, Gupta K, Wilson AC, Fields K, Cosgrove NM, Kostis JB. The effectiveness of outpatient appointment reminder systems in reducing no-show rates. *Am J Med*. 2010;123(6):542–8. doi: 10.1016/j.amjmed.2009.11.022.
13. Miller AJ, Chae E, Peterson E, Ko AB. Predictors of repeated “no-showing” to clinic appointments. *Am J Otolaryngol*. 2015;36(3):411–414.
14. Fischer HH, Moore SL, Johnson TL, Everhart RM, Batal H, Davidsoni AJ. Appointment reminders by text message in a safety net health care system: a pragmatic investigation. *EGEMS (Wash DC)*. 2017;5(1):20.
15. Hwang A, Atlas S, Cronin P, Asburner J, Shah S, He W, et al. Appointment “no-shows” are an independent predictor of subsequent quality of care and resource utilization outcomes. *J Gen Intern Med*. 2015;30(10):1426–33.
16. Gurol-Urganci I, de Jongh T, Vodopivec-Jamsek V, Atun R, Car J. Mobile phone messaging reminders for attendance at healthcare appointments. *Cochrane Database Syst Rev*. 2013;2013(12):1-17.
17. Crutchfield TM, Kistler CE. Getting patients in the door: medical appointment reminder preferences. *Patient Prefer Adherence*. 2017;11:141–50.