

Implementation of a Text Message to Improve Adherence to Clinic and Social Service Appointments

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Abstract

Introduction: Attendance to clinic appointments and compliance with treatment plans are essential components of HIV/AIDS care. Compliance is especially important in young and minority individuals living with HIV/AIDS. We assessed the effectiveness of a text-based reminder system compared with usual care in improving the attendance to clinic and social work appointments at a Ryan White-funded clinic based in an academic institution. **Methods:** Convenience sample looking at 2 periods, 6 months before initiation of text messages and 6 months after initiation of text messages. **Results:** Following a 6-month postintervention period, we found a statistically significant reduction in our no-show rates (individuals failing to keep scheduled appointments) of 24.8% versus 17.7%, *P* value .05. **Conclusion:** Using an inexpensive online text messaging system, we were able to significantly decrease no-show rates in a primarily younger, low-income, and uninsured population.

Keywords

text message reminders, HIV/AIDS, adherence

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Introduction

For individuals living with HIV and AIDS, regular attendance to their clinic visits and adherence to their care plans play a pivotal role in their management. Adherence and compliance with medical appointments are critical components of care and have been shown to prolong and enhance the quality of life for patients living with HIV and AIDS.^{1,2} Missed appointments and incomplete therapy can lead to viral resistance, treatment failure, and AIDS-related consequences.^{1,3-5} Also, for patient's seeking care through the Ryan White programs, a lack of follow-up with their social workers can inhibit their ability to benefit from financial and health-related resources which are available to them.

Clinics and care facilities have tried several methods to improve rates of patients' attendance to their clinic appointments; this includes giving patients reminder cards at the time of the appointment, reminder calls, and more recently reminder texts or e-mails.^{6,7} The mobile phone has been one of the fastest growing pieces of modern technology in the world. In 2013, the Pew Research Internet & American Life Project found that cell phone usage was at a staggering 91% in the United States.⁸ Individuals aged 18 to 25 have the highest rates of cell phone use in the country at approximately 97%.⁸ The study also

demonstrated that this high level of use is maintained in minority groups with "black, non-Hispanic" and "Hispanic" individuals at 93% and 88% use, respectively.⁸ As our population becomes more mobile and tech-savvy, it is vital that health-care environments evolve and adapt to the changing habits of a younger and more mobile generation.

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What Do We Already Know about This Topic?

Regular patient attendance of clinic appointments is crucial in reducing morbidity and mortality associated with the HIV, and text-based reminders have been useful in the maintenance of health-care-associated lifestyle changes.

How Does Your Research Contribute to the Field?

Our results demonstrate increased clinic adherence with an indigent, relatively mobile and uninsured patient group, which traditionally have been more challenging to follow up in the clinic with the use of an inexpensive text application.

What Are Your Research's Implications toward Theory, Practice, or Policy?

We are optimistic that the possibilities for the utilization of texting capabilities remain abundant and can be extended beyond clinic reminders for other applications of messaging in the health-care setting including sharing informational videos and inclusion of disease-specific health information via text messaging.

A majority of the original text-based studies have focused on the maintenance of lifestyle changes associated with chronic conditions such as weight loss, smoking cessation, and diabetes management.⁹⁻¹¹ These interventions have primarily been successful.⁹⁻¹³ Various interventions have been tested to increase the rates of clinic attendance such as reminders by mail or phone calls.⁷ This approach while useful can be quite costly, and its effectiveness has been found to decrease with time.⁷ Investigators have shown that when compared with no reminders, text message-based reminders are more effective in reaching a wide range of patients.⁶

The primary purpose of this study was to evaluate the use of text-based reminders to improve clinic appointment adherence in a Ryan White-funded HIV clinic.

Methods

Setting and Participants

This study was conducted at a Ryan White-funded HIV clinic located in El Paso, Texas. The site for the study is an academic institution located on the border between the United States and Mexico. El Paso County has a population of 835 593, with 82% being of Hispanic (mostly Mexican) origin.¹⁴ Approximately 23% of the population lives below the federal poverty line, while 30.7% of the population is uninsured.¹⁴ Ryan White-funded clinics are not-for-profit clinics set up by funding approved as a result of the Ryan White comprehensive AIDS resource emergency act, specifically to care for uninsured,

underinsured, and indigent individuals living with HIV or AIDS. This clinic is one of the 2 Ryan White-funded clinics serving this county and at the time of this study cared for approximately 250 patients, 80% (200 patients) of whom receive Ryan White funding.

Procedure

We established a web-based text messaging service to remind patients about their clinic, social work, and laboratory follow-up appointments. This text service was set up using Google's text messaging service, Google Voice™. We chose this service for several reasons: it was reasonably easy to set up and use and it was also free of charge with no setup, monthly membership, or contract fees. The services allowed the operators to maintain control over who sent the messages and therefore keep information confidential within the clinic-authorized users. All participants were current patients of the clinic. Patients who participated in the study signed a waiver agreeing to have their telephone number utilized through the web-based texting service system to receive reminders. As part of consent, patients were informed not to send personal or emergency health information to the text number. The clinic social worker and medical assistant were responsible for sending a text message to patients 3 days before their appointments. All text messages were preformatted and available in both English and Spanish based on the patient's documented preferred language.

Sample text message sent to patients: *This is a reminder of your appointment with Internal Medicine at xxxxx clinic on 00/00/0000 at 8:00 AM. Please arrive 30 minutes before your appointment. Thank you.*

Este es un recordatorio de su cita con Medicina Interna en xxxxx el día 00/00/0000 a las 8:00 am. Favor de llegar 30 min antes de su cita. Gracias.

The text message informed patients of their appointment at the internal medicine clinic at the institution so was not possible for someone casually seeing the text to link it to the HIV care clinic. Participants could text back to the number to ask for appointments to be rescheduled or to inform staff that they could not attend that particular appointment.

Analysis

We evaluated 2 different periods during the study. We compared clinic follow-up adherence rates in the 6 months from May 1, 2013, to December 30, 2013 (preintervention data) to the adherence rates for the 6 months from January 1, 2014, to July 30, 2014 (postintervention data). Before this study, the clinic had no reminder system in place, and patients were informed of future appointments at the time of scheduling. During the initial observation period, patients did not receive any text messages as a means to remind them of clinical services (usual care). During the follow-up period, we began sending patients text-based clinic appointment reminders.

Table 1. Baseline Demographics Group Comparison: Comparison of Demographics in Control Arm (May to December 2013) Versus Intervention (January to July 2014) Arm.

Variable	No Text Message Sent n (%)	Text Message Sent n (%)	P Value
Gender			.885
Female	31 (17.92)	27 (17.09)	
Male	142 (82.08)	131 (82.91)	
Race			.608
African American	1 (0.58)	2 (1.27)	
White	172 (99.42)	156 (98.73)	
Ethnicity			.537
Hispanic or Latino	136 (78.61)	122 (77.22)	
Not Hispanic or Latino	10 (5.78)	14 (8.86)	
Other or undetermined	27 (15.61)	22 (13.92)	

Variable	No Text Message Sent, Mean (SD) N = 173	Text Message Sent, Mean (SD) N = 158	P Value
Age	40 (13.02)	40.13 (13.41)	.924

Abbreviation: SD, standard deviation.

Demographic data including age, gender, and preferred language were reported using descriptive statistics. Rates of clinic attendance were reported using percentages of patients who attended or did not attend their clinic appointment. These percentages were compared using χ^2 statistics. The analysis was carried out using SAS software (SAS Institute Inc, Cary, North Carolina). This study was considered exempt by our institutional review board.

Results

The mean age of the clinic population was approximately 40 years (standard deviation 13) and was similar in both periods evaluated. Majority of patients were male (82%) and of Hispanic origin (approximately 78%). The demographic data did not differ significantly by period evaluated (Table 1).

In the preintervention period, a total of 326 individual appointments were scheduled at the HIV/AIDS clinic. Of these total scheduled appointments, 245 patients attended their appointments giving a no-show rate of 24.85%. In the follow-up period after text messages were initiated, a total of 243 patients were scheduled, with 200 patients attending their appointments. This resulted in a significantly reduced no-show rate of 17.7% with a statistically significant increase in clinic adherence of 7.15% (*P* value = .05) compared to the preintervention results of 24.8% (Figure 1). Although there were not as many patients scheduled for the text-messaging arm of the study, there was a statistically significant improvement in the number of patients who attended their appointments after receiving a text message reminder.

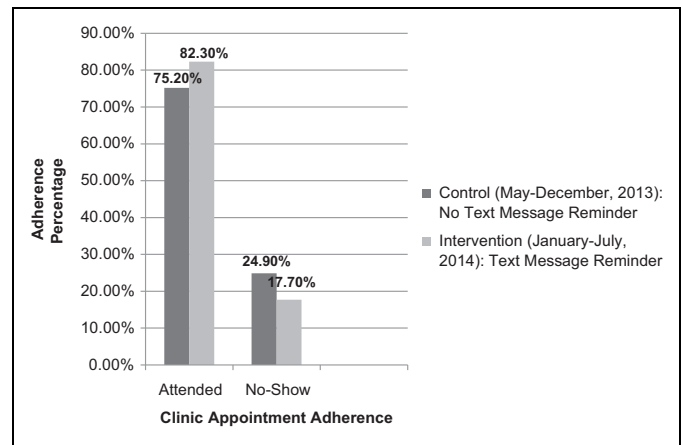


Figure 1. Adherence percentages between control arm (May to December 2013) and intervention arm (January to July 2014).

Discussion

The results of the data collected demonstrated a statistically significant improvement in adherence to clinical appointments with the implementation of the text-based reminder service. Due to scheduling issues, there were 83 fewer patients in the text messaging arm of the study than in the control group. However, there was a 7.15% increase in clinic attendance within the first 6 months of the implementation of the text messaging reminder system. This improvement translates to approximately 38 extra patients who would not have attended their appointments had usual care continued.

Our study was similar to several studies which found an improvement in clinic attendance after initiating text message reminders.^{6,15} The odds of attendance in this study were 59% higher with text messages when compared with no reminder and was cheaper than the cost of call reminders.¹⁵ We did find studies which showed no significant difference in attendance rates with text message reminders.^{16,17} It was, however, essential to note that these studies had vastly different populations when compared with ours. The study by van der Kop et al evaluated retention in care at 12 months. There was high retention overall in their study population (79% versus 81%) with a lot of psychological and social work support of participants. It is reasonable to understand why text messaging did not yield additional effect given the extent of support and the high retention in care.¹⁷

The Centers for Disease Control and Prevention reports that minorities account for nearly 70% of all new HIV-positive cases in the United States. While Hispanics make up 12% of the population of the United States, they account for 23% of new HIV-positive cases.¹⁸ Of note is that while new cases of HIV have declined among Caucasian gay and bisexual men by approximately 7%, among Hispanic gay and bisexual men, this rate has risen by about 24%.¹⁸ By age, only 16% of new cases occurred in individuals aged 50 or older.¹⁸ When this figure is overlapped with patterns of cell phone ownership in the United

States, one could surmise that minority groups of HIV- and AIDS-positive patients younger than 50 years of age would be likely to benefit from a text-based reminder system. The utilization of a text-based reminder service within a low-income indigent population in a developing country has shown this to be an efficient and cost-effective method for monitoring adherence and for patient appointment reminders.¹³ The reminders are targeted to a very specific demographic which in the past has been vulnerable to the consequences and pitfalls of antiretroviral medication nonadherence.^{1,3}

It appears the most efficient way that health-care facilities can communicate with patients is via telecommunications, either text messaging or telephone calls.^{6,7,9–11,13,19} As studies have shown, text message-based reminders are both cost-effective and effective in the scope of patient communication.

Although our results did produce positive outcomes concerning clinic adherence, it did have some weaknesses. The data collected for each cycle was for only 6 months, which may not be long enough to document the persistence of this result over time. As may occur with other intervention, there is the possibility of a drop-off over time. Our study also did not evaluate the long-term efficacy and changes to the overall health of the patients who participated, and we did not survey patients to determine their access to smartphones or phones with text messaging capabilities. Those without the capabilities above unfortunately would not be able to participate in the text-based arm of the study. With approximately 78% of our study population being of Hispanic origin, this may affect the generalizability of the findings to other populations or groups.

However, the study did have several strengths. Our population was a high risk, mainly Hispanic population living in a border community. This is a highly mobile community that tends to be underrepresented in literature. We also utilized a free and widely available method of mass texting, Google Voice, which makes our process easy to replicate and scale to the needs of the individual community or clinic. This factor is especially important for programs and patients in minority and low-income areas that may not have substantial funding to make large-scale changes to their reminder models. A study that evaluated the effectiveness of text-based reminders to bridge the communication gap in a rural developing country found reduced use of workers time, decreased fuel costs, and doubling of their capacity to manage patients with tuberculosis.¹³

Our results demonstrate increased clinic adherence with an indigent, relatively mobile and uninsured patient group, which traditionally has been more challenging to follow up in the clinic. We are optimistic that the possibilities for the utilization of texting capabilities remain abundant and can be extended beyond clinic reminders. Further areas of research should focus on expanding the study to more diverse populations and looking at long-term health effects and outcomes of improved clinic attendance. Also, evaluation of other applications of messaging in the health-care setting including sharing informational videos and inclusion of disease-specific health information via text messaging should be performed.

We have demonstrated a statistically significant reduction in missed appointments during the 6 months following initiation of the study's text-based reminder system. We remain optimistic that an extended study over a year or more would provide more promising results that would improve both patient care and communication.

Conclusion

Our study concluded that the implementation of a text message-based reminder system at a Ryan White-funded HIV care clinic in an academic center did significantly reduce the percentage of missed appointments. As both health-care facilities and patients adapt and get comfortable with the integration of technology in health care, we are excited to see the direction for future application of text messaging in particular in patient care.

Authors' Note

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Declaration of Conflicting Interests

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