

BMJ Open Quality **Increasing clinical attendance among adolescents and young adults: a simple and novel method**

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INTRODUCTION

Transition clinics have been introduced as a way to address the needs of adolescents and young adults (AYA) with a chronic condition requiring ongoing care.¹ Poor clinical attendance in this population due to social, economic and personal issues are known, however solutions to address this have been limited.^{2,3} Miscommunication and forgetfulness were cited as some of the reasons for missed appointments.^{4,5}

Studies have shown using short message service (SMS), also known as text messages, to remind patients of clinical appointments can reduce missed appointments and improve young patients' engagement in the management of their chronic disease.^{4,6,7} However further high quality research is required in AYA to determine the feasibility and effectiveness of SMS reminders.⁴

The primary objective of this study was to determine the effect of SMS appointment reminders to patients on uninformed no-show rates. The secondary objective of this study was patient satisfaction with the use of SMS communication.

METHODS

A pilot prospective cohort study with a retrospective control group was conducted at an AYA non-malignant haematology clinic at our centre.

All AYA patients who had an appointment scheduled at our clinic between February 2016 and December 2017 were included in the study. Included participants were (1) AYA patients transitioning from general haematology clinics at paediatric healthcare centres, and (2) new patients ≥ 18 years presenting with benign haematological issues.

Implied consent was applied on the phone using a standardised script for contacting the patient and introducing the details of the study.

Pre-intervention

A retrospective review of AYA ≥ 18 years of age who attended the clinic from April 2013 to August 2015 was collected to calculate no-show rates prior to the introduction of the intervention. The monthly uninformed no-show rate was calculated for patients attending the clinic during this time period.

Intervention

After participants had agreed to receive SMS reminders, 48 hours prior to the participant's scheduled appointment a single SMS reminder was sent between regularly scheduled business hours (08:00–16:00) along with a preclinical survey to complete. No other changes (besides the intervention) to the appointment booking process were made during the study period from prior to the intervention and end of the study period.

Data collection

Uninformed no-show rates were defined by absence from clinic without prior notice. A no-show due to a medical emergency was not considered an uninformed no-show rate. Uninformed no-show rates were calculated by total number of missed appointments over the total number of appointments per clinic retrospectively and prospectively. Rescheduled appointments, informed cancellations and absence from clinic due to a medical emergency were excluded from the final analysis. In addition, a patient's appointment was excluded from the analysis if they did not successfully receive the SMS reminder.

A survey was sent to study participants via SMS to obtain demographic information, details about their condition and patient satisfaction with SMS reminders.

Statistical analysis

For the primary analysis, a two sample t-test of proportions was conducted to measure the overall difference in uninformed no-show

rates prior to and after the introduction of SMS reminders. An independent samples t-test was used to calculate the mean difference of uninformed no-show rates prior to and after the introduction of SMS reminders. A p value of less than 0.05 was considered statistically significant. For the secondary outcomes descriptive statistics were used to describe patient demographics. All data were analysed using the Statistical Package for Social Science V.21 (SPSS, V.21 IBM) and social sciences statistics calculator (<https://www.socscistatistics.com/>).

Sample size

Based on an estimated no-show rate of 40%, and a desired power of 0.8, the sample size needed to show a 50% improvement in no-show rate (reducing no-show rate to 20%) post-intervention was a minimum 82 patients per cohort.

Patient and public involvement

Patients or the public were not involved in the design, conduct, reporting or dissemination plans of our research.

RESULTS

Participants

Of the 116 participants agreeing to participate in the study, 93 participants successfully received the SMS intervention. Of the 93 participants 26 (28.0%) participants completed the online demographic questionnaire. [Table 1](#) summarises demographic characteristics of survey participants.

Prior to intervention

From April 2013 to August 2015 a total of 51 clinical days with 236 appointments occurred since the start of the AYA clinic. Out of 236 clinical appointments, 91 (38.6%) appointments were uninformed no-shows. During this time the mean (SD) uninformed overall no-show rate over 51 clinical days was 39.9% (18.6%).

Intervention

SMS appointment reminders were sent from February 2016 to December 2017 for 49 clinical days for a total of 212 clinical appointments. Among the 212 clinical appointments, 16 (7.5%) appointments were rescheduled or informed cancellations and 50 (23.6%) were uninformed no-shows. The 16 clinical appointments that were rescheduled or informed cancellations by patients were subsequently excluded from the analysis leaving 196 clinical appointments included in the final analysis of uninformed no-show rates during the intervention period. Among the 196 clinical appointments, 50 (25.5%) appointments were uninformed no-shows. The mean (SD) uninformed no-show rate over 49 clinical days after the introduction of SMS appointment reminders was 25.3% (22.2%).

Pre-post intervention

Overall the total proportion of no-shows significantly decreased after the introduction of SMS appointment

Table 1 Demographic characteristics of 26 patients in benign haematology transition clinic with text-message reminders

Characteristics	Number (%)
Gender	
Male	4 (15.4)
Female	22 (84.6)
Age, years	
16–18	7 (26.9)
19–21	14 (53.8)
22–24	3 (11.5)
25+	2 (7.7)
Educational and/or work status	
Currently in school	16 (61.5)
Currently working	6 (23.1)
Taking time off	1 (3.8)
Prefer not to answer	3 (11.5)
Health condition	
Anaemia	7 (26.9)
Idiopathic Thrombocytopenic Purpura	3 (11.5)
Hereditary spherocytosis	2 (7.7)
Autosomal dominant thrombocytopenia	1 (3.8)
Kikuchi	1 (3.8)
Other blood count related issues (ie, low platelets)	2 (7.7)
Unsure	7 (26.9)
No answer	3 (11.5)

reminders by 13.1% (38.6%–25.5%) ($p < 0.05$, $z = 2.9$). In addition, the mean (SD) uninformed no-show rate also significantly decreased by 14.6% (39.9%–25.3%) after the introduction of SMS appointment reminders with a p value < 0.05 .

Patient satisfaction with SMS reminders

All participants in the study wanted to receive SMS reminders of their clinical appointments. In addition, some participants suggested receiving additional information through SMS including blood test results.

DISCUSSION

This study describes the significant improvement on uninformed no-show rates using an easy, low cost, practical reminder method (SMS reminders).

SMS reminders significantly improved the uninformed no-show rates by encouraging communication between the clinic and patient which in turn also improved overall clinical productivity.^{4,8} When patients miss appointments, not only does it impact their diagnostic evaluation and timely initiation of required treatment, it also places a monetary burden on health systems.⁹ The most commonly reported reason for missing an appointment was forgetfulness⁹

and SMS reminders could be simple and efficient way to remind patients about their appointments.

Limitations

First, we recognise the limitation of not including published improvement methodology to inform our implementation. The demographic survey sent via SMS to patients had a low-response rate of 28.0%. This is one of the first studies to send a survey link through SMS to AYA population which may not be the best method for survey completion in this population with a known low-response rate to survey completion.¹⁰ However, the primary purpose of the study was the text messaging reminders themselves, whereas the information collected through the surveys was secondary.

Another limitation of the study was the use of a retrospective cohort as a control group, thus limiting information on the patient demographics and context of the retrospective cohort patients. However, this was a pilot study with a >10% decrease in no-show rate after the introduction of SMS reminders indicating a significant clinical impact of SMS reminder on uninformed no-show rate. The results of this study will inform the design of a larger clinical trial to assess the effectiveness of SMS reminders.

Finally, this study did not address the complex reasons why AYA patients missed appointments. The purpose of this study was to determine the immediate impact of SMS reminders on uninformed no-show rates in order to inform a larger randomised controlled trial to address these complex reasons.

CONCLUSION

SMS reminders are an effective and sustainable method in reminding young adult patients about their appointment in addition to improving the efficiency and care of AYA clinics. By using inexpensive and practical strategies such as text messaging to increase clinical attendance rates, we would not only improve the care of our patients, but also reduce financial burdens resulting from missing appointments.

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Competing interests None declared.

Patient consent for publication Not applicable.

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REFERENCES

- Grant C, Pan J. A comparison of five transition programmes for youth with chronic illness in Canada. *Child Care Health Dev* 2011;37:815–20.
- Crosby LE, Modi AC, Lemanek KL, *et al*. Perceived barriers to clinic appointments for adolescents with sickle cell disease. *J Pediatr Hematol Oncol* 2009;31:571–6.
- Penzias R, Sanabia V, Shreeve KM, *et al*. Personal phone calls lead to decreased rates of missed appointments in an adolescent/young adult practice. *Pediatr Qual Saf* 2019;4:e192.
- Gurrol-Urganci I, de Jongh T, Vodopivec-Jamsek V, *et al*. Mobile phone messaging reminders for attendance at healthcare appointments. *Cochrane Database Syst Rev* 2013;2013:Cd007458.
- Kaplan-Lewis E, Percac-Lima S. No-show to primary care appointments: why patients do not come. *J Prim Care Community Health* 2013;4:251–5.
- Guy R, Hocking J, Wand H, *et al*. How effective are short message service reminders at increasing clinic attendance? A meta-analysis and systematic review. *Health Serv Res* 2012;47:614–32.
- Thakkar J, Kurup R, Laba T-L, *et al*. Mobile telephone text messaging for medication adherence in chronic disease: a meta-analysis. *JAMA Intern Med* 2016;176:340–9.
- Lin C-L, Mistry N, Boneh J, *et al*. Text message reminders increase appointment adherence in a pediatric clinic: a randomized controlled trial. *Int J Pediatr* 2016;2016:1–6.
- Chariatte V, Michaud P-A, Berchtold A, *et al*. Missed appointments in an adolescent outpatient clinic: descriptive analyses of consultations over 8 years. *Swiss Med Wkly* 2007;137:677–81.
- Hamilton AS, Zhuang X, Modjeski D, *et al*. Population-based survey methods for reaching adolescent and young adult survivors of pediatric cancer and their parents. *J Adolesc Young Adult Oncol* 2019;8:40–8.