Original Article

Use of text reminders to reduce no-shows in an internal medicine outdoor clinic

Abdul Rehman Arshad, Kamran Yousaf Alvi

Departments of Medicine, Military Hospital, Rawalpindi and 1 Mountain Medical Battalion, Bagh, Azad Kashmir

Objective: To determine patient characteristics predictive of follow up and to study the impact of short message service (SMS) based reminders in improving the follow up rates

Methodology: This randomized clinical trial was carried out from February to April 2015. Patients seen in general medicine outdoor clinic requiring a follow up visit were included. Demographic data were recorded.Date of the subsequent follow up visit was communicated verbally as well in writing. One day before the appointment, half of the patients were selected randomly using computer generated random number tables and were sent text reminders for follow up. The remaining did not receive any reminder. Attendance of all patients was marked the next day.

Results: Out of total 641 patients, 320 were sent text messages, out of which 41.88% did not follow up. Of the 321 not sent text messages, 57.01% did not follow up ($p<0.001$). Patients sent text messages were 1.8 times more likely to keep their appointments. Patients older than 50 years were 1.5 times more likely to follow up at the particular day. Gender, education, travelling time and the type of patient did not have any impact on follow up rates.

Conclusion: Text messages improve no-show rates in general medicine clinic. Older patients are more likely to follow up on time. (Rawal Med J 201;42:250-254)

Key words: Office visits, reminder systems, no-shows, attendance.

INTRODUCTION

Missed appointments are an important challenge in medical practice, even in industrialized nations. Statistics from United Kingdom National Health Services (NHS) show that 9% of outdoor appointments were missed in 2014- 2015.[1] Similarly, a US based research quoted figures of around 19% from 10 hospitals over a 10-year period.[2] This 'no-show' is considered as a major hurdle in delivery of cost-effective health care. Direct financial impact varies from one specialty to another and may be difficult to quantify. However, Blackpool Teaching Hospitals (UK) claims £4 million lost to missed appointments in 2015 alone.[3] Nevertheless, this is not the only angle for viewing this problem. Doctors could be concerned because the rates of missed appointments may be used as a performance indicator, as is the case in NHS.[4] In Pakistani government setups and specifically in our hospital, consultations are free, clinics are generally 'walk-in' and an appointment system is not strictly followed. Concerns about missing appointments from the patient's perspective thus become all the more important. Failing to follow up has been shown to have a significant negative effect on treatment outcome, time to recover from the disease and quality of life.[5]

Text-message reminders have been found to better than no reminders at all in reducing missed appointments.[6]However, dynamics are different in far off areas of developing countries like Pakistan, where poverty and illiteracy complicate the effective delivery of messages through cell phones. Data on our population is scarce. This study was therefore conducted to identify patient characteristics that could predict whether they follow up at the given day of appointment or not, and to study the impact of SMS based reminders in improving the follow up rates at out centre.

METHODOLOGY

This prospective observational study was carried out at 1 Mountain Medical Battalion Bagh from February 2015 to April 2015, after obtaining

approval from Ethics Review Committee of the hospital. Verbal consent for sending text messages was obtained from all the patients. All patients seen in general medicine outdoor clinic that required a follow up visit were included in this study. Demographic data including age, gender, level of education and mobile number was noted down. Travelling time to hospital was enquired from all patients. Whether the patients were new or old/established ones was also noted down.Date of the subsequent follow up visit was communicated to the patients verbally. It was also written prominently in urdu language on clinical record sheets retained by the patients.

A day prior to the appointment (including closed holidays), about half of the patients were selected randomly using computer generated random number tables and were reminded of their appointment through text messages sent on their mobile numbers during working hours. The messages were in Urdu language so that all patients could easily comprehend. Receipt of messages was confirmed through mobile network based notifications. Physical lists of appointments were maintained for each working day to mark the attendance of patients.

Data wereanalyzed with IBM Statistics 20. Different parameters were compared between patients sent SMS and those not sent SMS messages. Means of data having parametric distribution were compared using independent samples t-test. Mann-Whitney U test was used to compare medians of nonparametric data. Proportions of patients following up were compared between the two groups using chi square test. *P*?0.05 was considered statistically significant. Univariate and multivariate binary logistic regressions were performed to ascertain the effects of age, gender, level of education, type of patient, travelling time to hospital and SMS reminder on the likelihood of patients keeping their appointment. Any factor having p>0.250 on univariate regression was excluded from multivariate analysis.

RESULTS

During the 8-week study period, 641 patients were enrolled. Mean age was 51.79± 15.85 years and 330 (51.48%) of them were males (Table 1). Out of these, 324 (50.55%) followed up on the day of appointment, whereas 317 (49.45%) failed to do so. Text messages were sent to 320 patients, out of whom 134 (41.88%) did not follow up. Of the 321 not sent text messages, 183 (57.01%) did not follow up (p<0.001).

Table 1. Baseline characteristics.

Parameter	Total	Patients sent SMS	Patients not sent SMS	p
Age (years)	51.79± 15.85	51.89±16.08	51.69±15.64	0.872
Gender (male: female)	330: 311	161: 159	169: 152	0.554
Education (years)	5 (0-16)	5 (0-16)	5 (0-16)	0.556
Travelling time to hospital (hours)	1.23±0.42	1.24±0.43	1.22±0.42	0.562

Table 2. Regression analysis.

Parameter	Unadjusted OR	*p*	Adjusted OR	*p*
Age ^	1.619 (1.185, 2.212)	0.002	1. 505 (1.087, 2.083)	0.014
Gender@	1.323 (0.970, 1.805)	0.077	1.226 (0. 885, 1.697)	0.220
Education $	1.122 (0.821, 1.533)	0.469	-	
Patient type #	0.859 (0.629, 1.174)	0.341	-	
Travelling time %	1.006 (0.698, 1.451)	0.973	-	
SMS &	1.841 (1.346, 2.518)	<0.001	1.823 (1.329, 2.501)	<0.001

^ Reference: Upto 50 years @ Reference: females $ Reference: less than 5 years
# Reference: new patient % Reference: upto 1 hour & Reference: not sent

Univariate binary logistic regression showed that age and SMS reminders were predictive of patients following up on the day of appointment. Multivariate binary logistic regression model based on age, gender and SMS reminders explained 50.0% of the variance in follow up and correctly classified 58.0% of cases. Patients older than 50 years were 1.5 times more likely to follow up at the particular day. Similarly, those receiving SMS reminders were 1.8 times more likely to keep their appointments. Gender, education, travelling time and the type of patient did not have any impact on follow up rates (Table 2).

DISCUSSION

Several ways have previously been suggested to reduce no-show rates. Sending reminders is an important intervention, may it be by text messages, telephone calls or even postal messages.[7,8] Another strategy involves reducing waiting times. Williams et al found that no-shows dropped from 52% to 18% when wait times were reduced from 13 to 0 days in out-patient psychiatry settings.[9] American Medical Association believes that charging patients for appointments they miss is ethical.[10] This approach has also been tried, but did not yield positive results.[11] It is also important to track the reasons each patient gives for a no-show and then take corrective steps to resolve potential issues. Educating patients regarding the impact of missed appointments are also likely to mitigate the problem.

The idea of improving attendance in clinics by sending text messages has been tested in the past as well.[12,13] A very limited number of studies on this topic have previously been done in Pakistan. Waqar et al showed that SMS text messages are effective in increasing hospital visits for admission in patients planned for elective surgeries.[14] Considering the scarcity of local literature, we were not sure how our patient population would respond. It has now been clearly proven that SMS based reminders are a very useful means of increasing follow up rates in our study population also. These reminders work well because the patients possibly forget their appointments. SMS remains effective because of widening penetration of mobile phones in our society. They are cost- effective for health care setups because of cheap packages provided by cellular network companies. Latest research is now specifically focusing on how to make the text/content of messages more effective.[15]

The results of this study indicate that the patients received the messages positively. This can motivate physicians to open up new avenues in improving patient management using SMS technology. Possible applications include development of software that could automatically send text messages designed to improve patient compliance to treatment, providing motivation/health education as well as sharing results of investigations with the patients.

This study has also helped in identifying individuals more likely to keep their follow up appointments. Indirectly, it also provides an insight into the groups of individuals who need greater motivation to keep returning to hospital, so as to avoid discontinuation of treatment. We found that younger patients were more likely to miss their appointments. This is possibly due to multiple reasons. They are more likely to be busy during the day with their educational or work related commitments. They are also more likely to have acute/relatively short lived illnesses, in contrast to older people having chronic illnesses like diabetes or hypertension. Hence, it is possible that they might get cured during this period or that they don't take their illness seriously. Similar results have been described in other studies as well.[16] A study done fromUganda on patients with chronic diseases like hypertension and diabetes, however, did not find any relationship of no-shows with the age of the patients.[17]

Males and females had an equal chance of missing their appointments in this study. In a British GP setting, the odds of missing an appointment was lower for women compared to men (0.67; 95% confidence interval 0.19, 2.36), but this was statistically insignificant.[18] Similarly, another study done from Nigeria failed to show a statistically significant different in no-shows amongst male and female patients.[19] In contrast, a study from Jordan found that females were more likely to follow up as compared to males.[20] Similar results have been documented by Albaloushi, et al.[21] Travel time to hospital also did not affect chances of missing appointment, as has also been shown in a Saudi study.[22]

The level of patient education did not influence the probability of keeping their appointment either. Data from a genetics clinic in Canada indicates that people with a greater level of education are more likely to follow up in time.[23] This is understandable because education creates more awareness amongst the patients and we can expect a greater sense of responsibility amongst such patients towards improving their health. However, our results are contradictory. We did not collect data on employment/educational commitments of our patients. Possibly, our patients with lesser education

must be in lower grade jobs and thus might not be in an easy position to leave their places of work as compared to people in the top tiers of employment. Results similar to ours have been reported in a study done on AIDS patients in Uganda.[24]

This study is also limited by the fact that we did not follow up the patients failing to keep their appointments and thus could not determine the reasons for their doing so. It is very much possible that they might have come to the clinics some day later, but this data was not recorded. The primary diagnosis for all patients was not recorded considering the broad range of possibilities in this large cohort. We are thus not sure of any relationship between different illnesses and rates of follow up. Delivery reports sent by the mobile network carrier just indicated that the message had been delivered to the handsets. We could not say with surety whether the patients had actually read them or not. Moreover, our study describes data from a single centre only. Though the results are comparable to many other studies, they may not be generalizable to different other setups.

CONCLUSION

The results of this study have shown that text reminders significantly improve no-show rates. Elderly patients were most likely to keep their appointments, whereas gender, education, travelling time and the type of patient did not have any impact on follow up rates.

Author contributions:
Conception and design: ARA
Collection and assembly of data: ARA, KYA
Analysis and interpretation of the data: ARA, KYA
Drafting of the article: KYA
Critical revision of the article for important intellectual content: ARA
Statistical expertise: ARA
Final approval and guarantor of the article: ARA
Corresponding author email: Dr Abdul Rehman Arshad: maj.abdulrehman@gmail.com
Conflict of Interest: None declared
Rec. Date: Nov 5, 2016 Revision Rec. Date: Jan 20, 2017 Accept Date: Jan 27, 2017

REFERENCES

1. A zero cost way to reduce missed hospital appointments - GOV.UK [Internet]. [London]: Gov.UK; [updated 2016; cited 2016 Sep 12]. Available from: https://www.gov.uk/government/publications/reducing-missed-hospital-appointments-using-text-messages/a-zero-cost-way-to-reduce-missed-hospital-appointments
2. Kheirkhah P, Feng Q, Travis LM, Tavakoli-Tabasi S, Sharafkhaneh A. Prevalence, predictors and economic consequences of no-shows. BMC Health Serv Res 2015;16:13.
3. £4m cost of missed appointments | Blackpool Teaching Hospitals NHS Foundation Trust [Internet]. Blackpool: Blackpool Teaching Hospitals NHS Foundation Trust; c2016 [updated 2016; cited 2016 Sep 12]. Available from: http://www.bfwh.nhs.uk/4m-cost-of-missed-appointments/
4. Fitzmaurice B, Rogan A, Wong T, Akhtar S, Rayen A. Why do patients miss and cancel their chronic pain management appointments? Internet J Anesthesiol 2015;34.
5. Williams JAS, Pepper S. The impact of patient non-attendance on efficiency and the prediction of non-attendance for physical therapy, In: Proceedings of the Southeast Decision Sciences Institute. Orlando, FL; 2009. p. 80414. Available
6. at: http://www.sedsi.org/2009_Conference/pdf/2009sedsiproceedingscombined.pdf [accessed 2016 Aug 10].
7. 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;47:614-32.
8. Parikh A, 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;123:542-8.
9. Murdock A, Rodgers C, Lindsay H, Tham TC: Why do patients not keep their appointments? Prospective study in a gastroenterology outpatient clinic. J R Soc Med 2002;95:284-6.
10. Williams ME, Latta J, Conversano P. Eliminating the wait for mental health services. J Behav Health Serv Res 2008;35:107-14.
11. Buppert C. How to Deal with Missed Appointments. DermatolNurs 2009;21:207-8.
12. Perron NJ, Dao MD, Kossovsky MP, Miserez V, Chuard C, Calmy A, et al. Reduction of missed appointments at an urban primary care clinic: a randomised controlled study. BMC FamPract 2010;11:79.
13. da Costa TM, Salomao PL, Martha AS, Pisa IT, Sigulem D. The impact of short message service text messages sent as appointment reminders to patients' cell phones at outpatient clinics in Sao Paulo, Brazil. Int J Med Inform 2010;79:6570.
14. Downer SR, Meara JG, Da Costa AC. Use of SMS text messaging to improve outpatient attendance. Med J Aust 2005;183:3668.
15. Waqar SH, Zahid MA, Khan H. Effectiveness of mobile phone short message service (SMS) reminders for surgical outpatients admissions. J Pak Med Stud 2012; 2:suppl (2)1-24.
16. Hallsworth M, Berry D, Sanders M, Sallis A, King D,

Vlaev I, et al. Stating appointment costs in sms reminders reduces missed hospital appointments: findings from two randomised controlled trials. PLoS ONE 2015;10:e0137306.
17. Sharp DJ, Hamilton W. Non-attendance at general practices and outpatient clinics. BMJ 2001; 323:1081-2.
18. Kalyango JN, Hall M, Karamagi C. Appointment keeping for medical review among patients with selected chronic diseases in an urban area of Uganda. Pan Afr Med J 2014;19:229.
19. Neal RD, Hussain-Gambles M, Allgar VL, Lawlor DA, Dempsey O. Reasons for and consequences of missed appointments in general practice in the UK: questionnaire survey and prospective review of medical records. BMC FamPract 2005;6:47.
20. Mbada CE, Nonvignon J, Ajayi O, Dada OO, Awotidebe TO, Johnson OE, et al. Impact of missed appointments for out-patient physiotherapy on cost, efficiency, and patients' recovery. Hong Kong Physiotherapy J 2013;31:30-5.
21. Alyahya M, Hijazi HH, Nusairat FT. The effects of negative reinforcement on increasing patient adherence to appointments at King Abdullah University Hospital in Jordan. Inquiry 2016;53.
22. AlbaloushiHM, Da'ar O. Do patients with varying demographic and regional characteristics equally miss appointments across dental specialties? ESJ 2015;11:45-60.
23. Mohamed BA, Al-Doghaither AH. Missed appointments at public hospitals in Riyadh, Saudi Arabia. Saudi Med J 2002;23:388-92.
24. Humphreys L, Hunter AG, Zimak A, O'Brien A, Korneluk Y, Cappelli M. Why patients do not attend for their appointments at a genetics clinic. J Med Genet 2000;37:810-5.
25. Shumba C, Atuhaire L, Imakit R, Atukunda R, Memiah P. Missed doses and missed appointments: adherence to ART among adult patients in Uganda. ISRN AIDS 2013:270914.