

Telephone reminders reduced the non-attendance rate in a gastroenterology outpatient clinic

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ABSTRACT

INTRODUCTION: Non-attendance is a global health-care problem. The aim of the present study was 1) to investigate if a telephone reminder could reduce the non-attendance rate, 2) to study reasons for non-attendance and 3) to evaluate if a permanent implementation would be economically advantageous in a gastroenterology outpatient clinic like ours.

METHODS: This was a comparative intervention study with a historical control group in a gastroenterology outpatient clinic. The study lasted six months. Patients with a scheduled appointment in the first three-month period received no reminder (control group, $n = 2,705$). Patients in the following three-month period were reminded by telephone one weekday in advance of their appointment, when possible (intervention group, $n = 2,479$). Non-attending patients in the intervention group received a questionnaire. Based on the results, a financial cost-benefit analysis was made.

RESULTS: In the intervention group, 1,577 (64%) patients answered the reminder telephone call. The non-attendance rate was significantly lower in the intervention group (6.1%) than in the control group (10.5%) ($p < 0.00001$). Only 1.3% of the patients who answered the reminder turned out to be non-attendees. The most common explanation for non-attendance in the intervention group was forgetfulness (39%). The reminder telephone call was cost-effective.

CONCLUSION: In this outpatient clinic, telephone reminders were cost-effective and significantly reduced the non-attendance rate by 43%.

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Non-attending patients are a well-known problem in public health care. Non-attendance prolongs waiting lists, causes clinical inefficiency, waists of national health-care resources and increases health-related risks for the non-attending patient. Forgetfulness has previously been identified as the primary reason for non-attendance [1, 2]. It has been suggested that reminders can reduce this problem.

Danish patients can sign up for a free automated SMS reminder service, called EasySMS (NemSMS). However, despite the implementation of EasySMS, non-attendance rates remain relatively high in Denmark, e.g.

11% at the outpatient clinic of our institution. The effect of telephone reminders has been investigated in various settings [3, 4]. Compared with other reminder methods, it is the most effective with a 39% reduction of the non-attendance rate, but it is also the most expensive solution [3, 5]. The effect of the telephone reminder has, to our knowledge, not been investigated in a Scandinavian outpatient clinic. The aim of this study was to investigate the effectiveness of the telephone reminder and to examine the reasons for non-attendance. Furthermore, we investigated if a permanent implementation would be cost-effective in an outpatient clinic like ours.

METHODS

Design and setting

The study was designed as a comparative intervention study with a historical control group. It was performed at the outpatient clinic of the Department of Gastroenterology at Herlev Hospital, Denmark. Almost all patients visiting this outpatient clinic (approximately 12,000 visits/year) are covered by public health insurance and pay no visit fees.

Study population

The study population consisted of all scheduled patient visits from November 2013 to April 2014. Visit status from the first three-month period made up the control group (November-January). Patients with a scheduled appointment in this period received no telephone reminder. Scheduled visits during the following three-month period made up the intervention group (February-April).

Interventions

Patients in the intervention group received a reminder telephone call one weekday prior to their appointment. A maximum of two attempts were made to contact the patient per scheduled visit. The patient could either accept or cancel the appointment at the discretion of the patient. If a patient chose to cancel the appointment, the researcher noted whether the cancellation was due to patient or booking errors. The investigator would leave a message on a personal answering machine if the patient did not answer the telephone call. An answering machine was defined as personal if the patient present-

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ed him or herself by name. Booking lists, attendance status, demographics, phone numbers and addresses were retrieved from the patient administration system of the clinic. Online general phone directories were used if the phone number was not available from the administration system. The same investigator made all phone calls. Time per reminder call was calculated as the number of scheduled visits in the last week of intervention, divided by the total time spent performing the intervention.

Non-attending patients in the intervention group received a questionnaire consisting of nine questions concerning demographics, reasons for non-attendance, preferred reminder method, symptoms at the day of their appointment, if it was the first time they non-attended and if they had received an SMS reminder (EasySMS). Prior to the study, the questionnaire was validated through interviews with 15 patients. The questionnaire was validated for linguistics, construction and contents.

The questionnaire and a pre-stamped return envelope were mailed to the patients within a week of their non-attendance. If it had not been returned within four weeks, the patient was reminded by phone or the questionnaire was resent if the patient could not be reached by phone.

Outcome measures

The primary outcome was the effect of the telephone reminder on the non-attendance rate. The non-attendance rate was defined as the number of visits cancelled due to non-attendance, divided by the number of scheduled visits. In the intervention group, scheduled visits included all patients planned to be reminded at the day of the intervention irrespective of whether they actually received the phone call or not, received a voicemail, or if they chose to cancel their appointment in connection with the reminder. Secondary outcomes were cost effectiveness and reasons for non-attendance and cancelling in connection with the reminder.

Statistics

Sample size calculations were based on the assumption that telephone reminders would reduce non-attendance rates by 39% (from 11% to 6.7%) [3]. Based on a 5% significance level and a power of 90%, the sample size should be at least 652 scheduled visits in each study group. In order to compensate for a potentially high number of unreachable patients, a three-month inclusion period for each study group (approximate 800 patients per month) was considered necessary.

Chi-squared tests were used to compare categorical data. The primary analysis was based on the intention to treat (ITT) principle (i.e. all patients planned to be reminded irrespectively of whether they actually received

the call or not). Non-attendance rates were also calculated in the per protocol population (PP) (i.e. all patients who actually received the reminder). The results of the survey were evaluated using descriptive statistics. Non-attendance rates were presented as percentage with 95% confidence interval (CI). $p < 0.05$ was considered statistically significant.

Trial registration: not relevant.

RESULTS

Patients

A total of 2,705 and 2,502 appointments were scheduled in the control and intervention periods, respectively. The baseline characteristics of the two groups were similar (**Table 1**). In all, 23 patients had cancelled their appointment before the day of the intervention. Consequently, 2,479 patients in the intervention group were included in the analyses.

A total of 1,577 (64%) patients in the intervention group received a reminder telephone call, and 146 (6%) received a voice mail message. The remaining 756 (30%) patients could not be reached (**Table 2**). In all, 110 (7%) patients chose to cancel their appointment in connection with the reminder. 66% of the cancellations were caused by patient errors and the remaining (34%) were caused by booking errors.

TABLE 1

Baseline characteristics. The values are n (%).

	Control (N = 2,705)	Intervention (N = 2,502) ^a	p-value ^b
<i>Gender</i>			0.15
Male	1,158 (43)	1,022 (41)	
Female	1,547 (57)	1,480 (59)	
<i>Age, yrs</i>			0.33
0-20	89 (3)	106 (4)	
21-40	773 (29)	720 (29)	
41-60	1,013 (37)	928 (37)	
≥ 61	830 (31)	748 (30)	
<i>Diagnosis^c</i>			0.78
Liver	518 (19)	487 (19)	
Gastrointestinal	2,187 (81)	2,015 (81)	
<i>Type of visit^d</i>			0.89
New patients	281 (10)	257 (10)	
Established patients	2,424 (90)	2,245 (90)	

a) Baseline characteristics were retrieved from the administration system. A total of 23 patients chose to cancel their appointment before the day of intervention and were excluded from the analysis.

b) χ^2 -test.

c) The patients were divided into 2 groups (liver or gastrointestinal disorder) according to their diagnosis code.

d) The patients were divided into 2 groups (new or established patients) depending on whether they visited the clinic for the 1st time or were established patients.

Primary end point

The non-attendance rate was 10.5% (283/2705; 95% CI: 9.3-11.6%) in the control group and 6.1% (150/2,479; 95% CI: 5.1-7.0%, ITT) in the intervention group (Table 2), which corresponds to a 43% reduction (Table 2). The reduction was statistically significant ($p < 0.00001$). In the PP analysis, the non-attendance rate was 1.3% in the intervention group (21/1,577; 95% CI: 0.8-1.9%, PP). This was significantly lower than in the control group ($p < 0.00001$).

Economic consequences

Each reminder telephone call took approximately two minutes. This corresponds to 35 hours per 1,000 scheduled visits. An unskilled office assistant is paid 145 DKK (26 USD) per hour in Denmark. This yields a cost of 5,075 DKK (927 USD) per 1,000 scheduled visits. The productivity of outpatient clinics in Denmark is evaluated by the Danish Ambulatory Grouping System (DAGS). It has financial consequences if a clinic is not sufficiently effective. The clinic will lose approximately 1,050 DKK (192 USD) per cancelled visit. In this setting, the telephone reminder can prevent 45 non-attendances per 1,000 bookings. This would increase the productivity of the clinic, expressed as an increase in DAGS earnings, by 47,250 DKK (8,640 USD) per 1,000 bookings. Some extra expenses for office facilities must be expected, but the earnings are still expected to exceed the expenses associated with the reminder service.

Reasons for non-attendance

The questionnaire was sent to 145 non-attending patients in the intervention group. Questionnaires were not sent to four patients because of missing addresses, and one patient had died. The response rate was 65%. The results are outlined in Table 3.

DISCUSSION

The present study demonstrates that telephone reminders significantly reduce the non-attendance rate by 43% (ITT) and that implementing the reminder is cost-effective.

In patients who actually received the telephone reminder (PP), an even greater reduction of the non-attendance rate was observed (88%). As only 64% of the patients in the intervention group received the reminder, which is a lower fraction than reported in previous studies [6-8], the effect of the intervention could have been even greater if contact rates were improved, e.g. through continuously updating telephone numbers in the patient files and by contacting patients "out of hours". However, it also has to be considered if patients, who did not answer the telephone, represent a high-risk subpopulation, making the before mentioned PP esti-

TABLE 2

Non-attendance rate in the control and the intervention group.

	Total, n	Non-attending patients, n	Non-attendance rate, % (95% CI)
Control group	2,705	283	10.5 (9.3-11.6)
Intervention group ^a	2,479	150	6.1 (5.1-7.0)
Received the telephone call	1,577	21	1.3 (0.8-1.9)
Received a voice mail	146	6	4.1 (0.9-7.3)
Received no reminder	756	123	16.3 (13.7-18.9)

CI = confidence interval.

a) The intervention group included only patients still scheduled at the day of the intervention.

TABLE 3

Questionnaire results^a.

	n (% of received answers)
1st-time non-attendance	43 (46)
Symptoms at the day of the appointment	43 (46)
Receiving EasySMS	12 (13)
Received reminder telephone call	13 (14)
<i>Preferred reminder method^b</i>	
SMS	64 (68)
Telephone	17 (18)
Monetary fine	3 (3)
Letter	12 (13)
E-mail	15 (16)
Other	10 (11)
<i>Reasons for non-attendance^c</i>	
Forgot appointment	37 (39)
Too ill	17 (18)
Tried to cancel	9 (10)
Work	8 (9)
Booking mistake	7 (7)
No transportation	4 (4)
No need to see a doctor	4 (4)
Family	2 (2)
Other	48 (51)

a) A total of 94 non-attending patients returned the questionnaire (65%). The patients could choose between pre-specified categorical answers, or write their preferred reminder method/reason for non-attendance in the open category "Others".

b) Patients were allowed to choose > 1 preferred reminder.

c) Patients were allowed to give > 1 reason for non-attendance.

mate too optimistic. Thus, the non-attendance rate in this subpopulation was 16.3% compared with 10.5% in the control group, and 1.3% among patients receiving the reminder.

Notwithstanding these uncertainties, the effect of the telephone reminder in this study is in line with previous findings [3, 4]. However, it is unknown if these results can be extrapolated to other specialties. Thus, a large-scale Canadian study showed that being a patient

Patients in the intervention group were reminded by telephone one weekday prior their appointment.



in the gastroenterology division was an independent predictor for non-attendance [4]. This indicates that, compared to the general patient population, the present patient group represents a population that may respond differently to reminders than other populations.

The estimation of the cost-effectiveness of the telephone reminder is based on the assumption that the patients reminded would either show up or cancel their appointment so that the time slot could be used for another patient. To minimise the risk of forgotten appointments, the patients were contacted one weekday prior to their appointment. However, this may not be a rational approach as it turned out to be difficult to book another patient if an appointment was cancelled because of the short notice. Thus, the reminder would only have a small effect on waiting lists and not reach the optimal financial benefit. Increasing the reminder delay to 48 hours would improve the chance of allocating patients to vacant appointments. Previous studies have demonstrated that the time at which the reminder are issued is not related to effect size [3]. It is noted that 110 (7%) patients chose to cancel their appointment in connection with the reminder. These patients were not counted as no-shows in the primary analyses. Supplementary analyses showed that excluding these patients did not substantially alter the results.

The most common cause of non-attendance in the intervention group was forgetfulness (39%). However, most patients wrote additional answers in the open category "Others" (e.g. clerical mistakes, fear). It is surprising that even in the intervention group, 39% forgot their appointment, but it is important to emphasize that 86% of the non-attending patients did not receive the re-

minder. Thus, the high rate of forgetfulness cannot be seen as a lack of effect of the reminder. 46% of the patients had symptoms on the day of the appointment, but only 18% gave illness as the reason for their non-attendance. This indicates that most patients were able to show up and had a clinical incentive for the appointment. It is striking that patients with symptoms stay absent, despite the incentive to seek medical assistance to relieve their symptoms.

SMS reminders were the most preferred reminder method, and previous studies have demonstrated that this method reduces the non-attendance rate [9, 10]. The institution at which the present study was performed has provided the free SMS service EasySMS since 2011. Patients have to sign up before receiving the SMS reminder, and one may expect that only a selected group will do this. Consequently, the SMS reminder does not reach its potential effect seen in scientific studies [9, 10]. In this setting, a high non-attendance rate was observed at baseline despite the service (11%). We have not been able to collect data on those who received EasySMS. Thus, direct comparison of non-attendance rates between patients with and without SMS reminders was not possible.

Our study had some limitations. It was a single-centre study, and although the results are consistent with previous findings, it is unknown if they can be extrapolated to other settings. The economic cost-benefit analysis was based on the Danish reimbursement system for outpatient clinics, and it is uncertain if the economic benefit would have been of the same magnitude in other settings. It is important to emphasise that the financial calculation is theoretical and made on the assumption that all cancelled visits will be filled by other patients. Despite several reminders the survey response rate was only 65%, which increases the risk of selection bias. The study was non-randomised and utilised a historical control group. In theory, seasonal variance in the non-attendance rate could have biased the results. However, data from preceding years indicate that seasonal variance is minimal and thus unlikely to have influenced the results substantially. Another potential bias to be considered is the difference between the study groups. Patients who cancelled their appointment before the intervention day were excluded, while all patients were included in the control group. However, only 23 patients (0.9%) chose to do so, suggesting that this difference is of limited significance.

The telephone reminder is an expensive solution, and other reminder systems such as SMS or letter reminders may be considered before implementing the telephone reminder [3, 9-11]. However, as demonstrated in this setting, non-attendance rates may be high despite the availability of EasySMS, which makes it neces-

sary to use telephone reminders instead in some settings.

CONCLUSION

The telephone reminder significantly reduced the non-attendance rate, and the primary reason for non-attendance was "forgot appointment". The telephone reminder would be cost-effective in this setting.

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