

REDUCING NONCOMPLIANCE TO FOLLOW-UP APPOINTMENT KEEPING AT A FAMILY PRACTICE CENTER

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In this study, we evaluated follow-up appointment keeping at a family practice center. To determine if noncompliance could be reduced, four treatments were implemented: no-treatment control, modified appointment card, free follow-up, and a reduced rate follow-up. Thereafter, the reduced rate follow-up was implemented again to determine the extent noncompliance could be reduced for all eligible patients. Incentives significantly increased follow-up appointment keeping, whereas the modified appointment card was ineffective. A cost analysis suggested that the no-treatment control and modified appointment card conditions were the least expensive, but also the least effective. The incentive conditions were more expensive, but the reduced rate condition generated the most net revenue. Questionnaire data suggested that the incentive conditions had an effect on noncompliance and may be considered for use in other medical settings.

DESCRIPTORS: noncompliance, follow-up appointment keeping, family practice center, incentives, behavioral medicine

Compliance to therapeutic regimens is generally defined as the extent to which the patient adheres to a prescribed medical treatment. It has been noted that noncompliance to medical regimens is one of the most crucial issues in medicine today (Gentry, 1977).

One aspect of patient compliance is attendance to scheduled appointments. Sackett and Haynes (1976) noted that reported compliance to scheduled appointments varies considerably. For example, Roth, Caron, and Hsi (1970) looked at appointment-keeping compliance of patients with peptic ulcers and found it to be 71%; however,

compliance for attending a clinic appointment following blood pressure screening was only about 50% (Finnerty, Mattie, & Finnerty, 1973). Overall noncompliance to scheduled appointments ranged from 15% to 60%. Patient compliance in attending scheduled appointments with physicians is important because the individual who misses a scheduled appointment is possibly being harmed by not receiving needed, timely medical attention. Also, there is a potential risk to community health.

Much of the emphasis in the research in this area has attempted to determine which demographic or attitudinal characteristics of patients predict appointment-keeping compliance (Albert, 1964; Becker, Drachman, & Kirscht, 1972; Derwin, Stone, & Beck, 1978; Goldman, Freidin, Cook, Eigner, & Grich, 1982; Jonas, 1971; Weirnerman, 1965). Efforts to increase compliance have involved the use of letters or telephone prompts (Gates & Colborn, 1976; Nazarian, Mechaber, Charney, & Coulter, 1974; Shepard & Moseley, 1976), overt commitments (Levy & Clark, 1980), or incentives and reinforcers (Bunck & Iwata, 1978; Iwata & Becksfort, 1981; Reiss & Bailey, 1982; Reiss, Piotrowski, & Bailey, 1976).

Gates and Colborn (1976) examined and compared the effects of a telephone prompt, a personalized letter prompt, and no treatment on three groups of adult patients attending a neighborhood

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health center. Appointment compliance was higher for the letter reminder group and the telephone reminder group. In a similar effort, Shepard and Moseley (1976) determined that both telephone reminders and mail reminders increased appointment keeping with children who were outpatients. The telephone reminders were slightly more effective in improving compliance than mailed reminders. Using similar strategies, Schroeder (1973) examined missed and cancelled appointments by placing adult outpatients in one of four groups: control, postcard, nurse call, and physician call. Treatment for the latter two groups consisted of either a nurse or a physician telephoning the patients to remind them about the upcoming appointment. The postcard strategy was the most effective; however, confounding factors such as a low percentage of completed calls by the physician interfere with a simple interpretation of the results.

Information on the postcard reminder was examined by Nazarian et al. (1974) who looked at "keep rates" for child outpatients. The amount of information was not an important variable in increasing compliance.

Most attempts to increase appointment-keeping compliance have been through prompts in the form of telephone calls or mailed reminders. These efforts produced moderate increases in compliance to appointment keeping. There are, however, some consistent problems with most of this research. For example, reliability data are missing in all cases. Also, no attempt was made to determine if the procedures were socially, medically, or clinically significant. For example, it is not clear how feasible or practical these procedures would be in many settings, or if physicians would consider implementing the strategies in their practices. Thus, social validation data are needed to be able to suggest the potential maintenance of these treatment strategies or the incorporation of these procedures into administrative practices and policy. Although Shepard and Moseley (1976) provided a cost-benefit analysis evaluating the economic feasibility of sending out mail reminders, no other formal evaluation was performed.

An innovative approach to increase appoint-

ment-keeping compliance compared a control group to a treatment group whose subjects were asked by the experimenter if they intended to make their next appointment and then were asked to sign an agreement to do so (Levy & Clark, 1980). Unfortunately, no significant difference in compliance for the two groups was reported.

Attendance at a free dental clinic was increased in a study examining the effects of: (a) single written note prompt; (b) a series of three prompts consisting of a note, telephone call, and home visit; or (c) a note plus a \$5 incentive (Reiss et al., 1976). The single prompt plus incentive was the most effective, whereas the single prompt was the least effective. A cost-effectiveness analysis indicated that the prompt plus incentive treatment was more expensive than the single prompt, but less expensive than the multiple prompt. In a systematic replication, Reiss and Bailey (1982) compared: (a) a control group; (b) a multiple contact procedure in which numerous postcards and telephone calls were used; (c) a problem-solving procedure in which a social worker aide discussed with the family strategies to ensure attendance; (d) an incentive procedure in which parents could select a gift contingent on seeking dental care; and (e) an incentive plus problem-solving procedure. All treatments significantly increased dental visits over baseline; however, the multiple contact nonincentive condition was the most cost-efficient. The Reiss et al. (1976) and Reiss and Bailey (1982) research suggested that appointment keeping can be increased with low income families. Their work also provides a model for cost analysis. The main concern of these strategies is the use of additional expenses (cash incentives) to increase attendance at the center, or the effort involved in multiple visits by social workers, or both. It seems unlikely that these kinds of procedures would be used in very many private or public clinics or in private medical or dental practices. Although it is clear that these kinds of antecedents (visits) and positive consequences (incentives) affect clinic attendance, it seems more prudent to search for practical indigenous antecedents and consequences.

The purposes of the current research were: (a)

to determine the extent of noncompliance to follow-up appointment keeping at a family practice center; (b) to implement, evaluate, and compare four treatment conditions aimed at increasing compliance to follow-up appointment keeping; (c) to implement one of the more effective and practical treatment conditions for 6 weeks longer; and (d) to determine the overall costs for implementing each of the four conditions and compare them with their relative effectiveness. A simple randomized subjects design was used to evaluate the four treatment procedures, along with comparisons to baseline conditions and to the most effective treatment. Finally, questionnaire data were gathered to examine the medical/social impact of these procedures.

METHOD

Participants and Settings

The Family Practice Center (FPC) of the Southern Illinois University School of Medicine served as the setting for this research. This is a resident training program in family practice as well as clinic for comprehensive medical care. The FPC served about 700 to 900 patients per month, approximately 16% of whom were scheduled for follow-up appointments.

The participants of this study were patients who had scheduled follow-up appointments at the FPC. The medical conditions requiring follow-up services included ear infections, blood pressure checks, thyroid problems, muscle sprains, urinary tract infections, diabetes, bronchitis, tachycardia, lacerations, suture removal, and ovarian cysts. Excluded from the study were obstetric patients because they were not usually billed for each office visit due to payment of a prearranged flat fee. Because incentives in the form of fee *reductions* were used in this research, all nonpaying patients were excluded (approximately 25% of the total number of patients). This included Illinois Department of Public Aid patients, FPC physicians and staff, and the faculty and students of the Southern Illinois University School of Medicine. Permission to conduct this research was approved by the FPC Director

and the Human Subjects Committee at Southern Illinois University. To protect patient confidentiality, we had access only to patient identification numbers; thus, all data collection was performed by the FPC staff.

Normally, a letter was sent from the FPC to any patient who failed to attend a scheduled follow-up appointment. If a patient missed two follow-up appointments, another letter was sent notifying the patient about the failure and advising that future "no-shows" would result in a \$5.00 charge not covered by insurance carriers. A third failure to attend a scheduled appointment was followed by a registered letter stating that a \$5.00 charge had been incurred as a result of the missed appointment. A fourth missed appointment was followed by a termination letter, ending the patient's involvement with the FPC. These letters were sent to all patients in this research who failed to attend follow-up appointments. No action was taken with patients who cancelled an appointment, but failed to reschedule another appointment.

Procedure

The FPC receptionist was responsible for placing the patients into the treatment conditions. She was instructed specifically not to elaborate on the need to attend the follow-up appointment.

The receptionist was also responsible for collecting the data determining whether or not patients attended the scheduled follow-up appointments. Each morning, the nurse provided the receptionist with the list of patients who had scheduled follow-up appointments that day. All patients were required to check in with the receptionist before they were seen by the physician. The receptionist marked whether the patients attended or failed to attend follow-up appointments. Follow-up appointments could also be classified as cancelled and not rescheduled, or rescheduled at another time. Noncompliance to follow-up appointment keeping was defined as patients who either failed to attend or cancelled their scheduled, physician-mandated, follow-up appointment. Rescheduled appointments were not counted unless

the rescheduled appointment was also missed or cancelled.

All data forms were either collected weekly or mailed weekly to one of us (JMR). Noncompliance was then calculated from these permanent product data.

Pilot research. The purposes of the pilot research were: (a) to determine the overall extent of noncompliance to follow-up appointment keeping at the FPC; (b) to determine if follow-up appointments were more likely to be missed on a particular day of the week; (c) to determine if follow-up appointments were more likely to be missed by patients seeing a particular physician; and (d) to gather specific information on the types of appointments that were missed. For example, it might be possible that patients seen for blood pressure screenings were more likely to miss follow-up appointments than patients seen for infectious conditions. Finally, data were collected on the medical/social importance of this problem. A questionnaire was given to FPC physicians and they were asked if the baseline level of follow-up appointment-keeping noncompliance was serious enough to warrant intervention. They were also asked if they had any suggestions to ameliorate this problem. The participants in this pilot research consisted of *all* FPC patients scheduling follow-up appointments.

Phase I: Baseline. In this 1-month phase, the percentage of noncompliance was determined, using patients who were eligible for inclusion in this research.

Phase II: Experimental conditions. To determine if different incentive or prompt conditions would influence follow-up appointment-keeping compliance, patients who scheduled follow-up appointments were sequentially placed into one of four treatment conditions: (a) no-treatment control (NTC); (b) modified appointment card (MAC); (c) free follow-up (FF); and (d) reduced rate follow-up (RR). For example, Patient "A" scheduled a follow-up appointment and was placed in the no-treatment control group. Patient "B" scheduled the next appointment and was placed in the modified appointment card condition; Patient "C" was placed in the free follow-up; Patient "D" was

placed in the reduced rate follow-up group. Each patient was placed into a treatment condition only once.

No-treatment control: This condition was identical to the baseline condition.

Modified appointment card: This condition involved an attempt to increase compliance through the use of a card modified to act as a more salient discriminative stimulus than the appointment card that was currently in use. This condition was also implemented as an alternative to telephone and mail reminders because the Director of the FPC was concerned that telephone and mail reminders would take up an inordinate amount of staff time. The standard card used by the FPC was a small 8.5 cm by 5.0 cm white printed card stating the time and date of the scheduled follow-up appointment, as well as the name of the physician the patient was scheduled to see. The modified card was much larger (12.7 cm by 7.7 cm). The printing was big and bold on a yellow card containing a bright, red sticker which read, "Remember Your Follow-Up Appointment!" Instructions on the card suggested that the sticker should be placed in a prominent place, such as on an appointment calendar.

Free follow-up: When the patient scheduled the follow-up appointment, a card was given stating that if the patient attended the scheduled follow-up appointment, or if the patient cancelled the appointment and rescheduled another follow-up appointment at the time of the cancellation, and attended that appointment, there would be no charge for the follow-up appointment. This incentive only covered the physician's charge and did not cover any laboratory costs. If the patient failed to attend the scheduled follow-up appointment, or if the patient failed to reschedule another follow-up appointment at the time of the cancellation call, eligibility for the free follow-up visit was lost.

Reduced rate follow-up: This condition was identical to the free follow-up, except that this incentive stipulated that if the patient attended the follow-up appointment, the follow-up visit charge was only 50% of the regular cost, excluding laboratory costs.

Phase III: Reduced rate. At the termination of

Phase II, the statistical analysis showed that the incentive conditions (FF and RR) were the most effective in reducing noncompliance, but there was no significant difference between the two incentive conditions. In response to practical limitations, and to determine the extent that an incentive could reduce noncompliance to follow-up appointment keeping over time, the RR condition was continued for 6 weeks for all eligible patients scheduling follow-up appointments at the FPC. The procedures during this phase were identical to Phase II, except all eligible patients were placed in the condition. Phase III was run during the Christmas season which considerably reduced the overall patient load at the FPC.

Evaluation. A cost analysis of the four Phase II treatment conditions was performed. Data were gathered on the amount of money required to implement the various conditions (e.g., staff time, paper supplied, printing costs), and compared across conditions and for individuals in each condition. A cost-benefit analysis was also performed examining the cost of each condition, the money generated from the increased compliance, and the revenue lost for missed appointments.

To determine if there were any significant differences between the four treatment conditions in Phase II, the chi-square test for independent samples was performed (Siegel, 1956). Also, the data were collapsed into incentive (FF and RR) and nonincentive (NTC and MAC) categories to examine the effects of incentives. The MAC, FF, and RR1 conditions were all compared to the NTC (baseline) conditions. After the RR condition was implemented again in Phase III, this condition was compared with NTC (baseline) condition in Phase II. Additional chi-square tests were performed on the Phase I data to determine if there was a significant difference in compliance rates as a function of day of the week or physician.

Reliability was calculated during each of the first three phases. A second observer examined the permanent-product data and calculated noncompliance to follow-up appointment keeping. An agreement was defined as both observers independently determining the same number of missed appointments. Reliability estimates that were cal-

culated during each of the first three phases were all 100%.

To determine the medical significance of the results, a questionnaire was sent of 7 FPC physicians and 6 practicing physicians of an HMO (Health Maintenance Organization) in St. Cloud, Minnesota. Five completed the questionnaire. It included a graph of the results that did not identify what the treatment procedures were. Four questions of particular note are reported here. They were: (a) Did any condition or conditions produce a significant decrease in noncompliance to follow-up appointment keeping?; (b) Did you notice an increase in compliance to follow-up appointment keeping? (asked only of FPC physicians); (c) Are you interested or possibly interested in implementing procedures to increase compliance?; and (d) In practice, would you use an incentive to reduce noncompliance as seen in the graph? Further, the HMO physicians were asked if they "overbooked" appointments in order to make up for no-shows.

RESULTS

To determine the extent of noncompliance to follow-up appointment keeping, data were analyzed on all patients scheduling follow-up appointments during a 5-month period. There were 100-150 follow-up appointments scheduled each month. The mean noncompliance over this 5-month period was 20%. There were no effects for day of the week or for specific physicians. Also, particular medical conditions requiring follow-up appointments did not appear to mitigate against compliance.

The results of this pilot research were presented to the physicians at the FPC in a questionnaire to determine the clinical significance of noncompliance to follow-up appointment keeping: Eight of the 12 physicians completed the questionnaire. Responding to the question, "Is current noncompliance acceptable?", five (63%) stated that this level was unacceptable. Seven of the physicians (88%) stated that some attempt should be made to decrease this level of noncompliance, and five (63%) expressed an interest in helping in this endeavor.

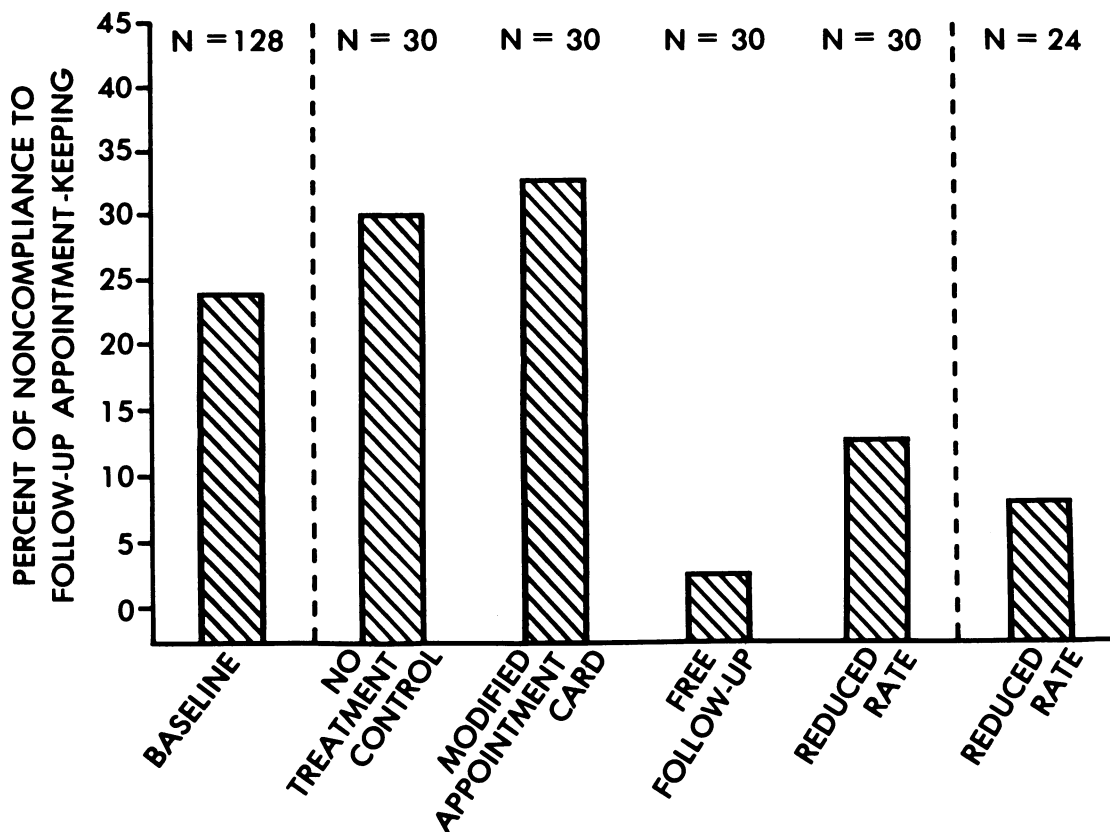


Figure 1. Percentage of noncompliance to follow-up appointment keeping.

They were also asked if they had suggestions on how to lower noncompliance. Two (25%) provided no suggestions; three (38%) mentioned some aspect of patient education such as explaining why the follow-up appointment was needed; and two (25%) mentioned the use of positive consequences. Only one physician suggested the use of a mailed reminder.

The last question asked what instructions the physicians currently gave patients about the need for a follow-up appointment. The majority of the responses (63%) stressed education.

Of the 128 eligible patients, 31 patients were noncompliant (Figure 1). Compliance during baseline was 24%. The numbers of no-shows and cancellations were approximately equal.

Figure 1 shows that noncompliance was 30% in the no-treatment control group, 33% in the modified appointment card group, 3% in the free

follow-up group, and 13% in the reduced rate follow-up group. A chi-square analysis presented in Table 1 indicates that the four conditions were significantly different from each other, $\chi^2(3) =$

Table 1
Statistical Analysis of Phase II and Phase III Data

	Treatment conditions				
	NTC	MAC	FF	RR	RR2
Frequency-compliance	21	20	29	26	22
Frequency-noncompliance	9	10	1	4	2
Comparison	χ^2	df	<i>p</i>		
NTC vs. MAC vs. FF vs. RR	11.25	3	.02		
Incentive vs. non-incentive	11.21	1	.001		
NTC vs. FF	7.68	1	.01		
NTC vs. MAC	.08	1	ns*		
NTC vs. RR	2.45	1	ns*		
NTC vs. RR2	4.40	1	.05		

* Not significant.

Table 2
Results of Medical Significance Questionnaire

	FPC		HMO		Total	
	#	%	#	%	#	%
1. (a) Free follow-up produced significant decrease in noncompliance.	7	100	2	40	9	75
(b) Reduced rate produced significance in noncompliance.	0	0	3	60	3	25
2. Noted an increase in compliance to follow-up appointment keeping.	2	29	N/A		2	29
3. Interested or possibly interested in implementing procedures to increase compliance.	7	100	5	100	12	100
4. Interested in using incentive to reduce noncompliance as seen in graph.	5	71	4	80	9	75

11.25, $p < .02$, and that the incentive conditions had a significantly lower noncompliance than the no-incentive conditions, $\chi^2(1) = 11.21$, $p < .001$. A comparison of NTC to FF produced a significant finding, $\chi^2(1) = 7.68$, $p < .01$, whereas the NTC and MAC comparison was nonsignificant. The NTC and RR comparison was also not significant. A chi-square test for the FF and RR conditions was not possible due to the low expected frequencies. A Fischer exact probability test (Siegel, 1956) was conducted and no significant difference was found.

Phase III: Reduced Rate

Because differences in noncompliance for the two incentive groups were not statistically significant, and in response to practical limitations of the FPC, the reduced rate condition was implemented again for 6 more weeks. Noncompliance for the 24 participants who scheduled follow-up appointments during this time was 8%. A comparison of the NTC condition with the second reduced rate condition (RR2) produced a significant result, $\chi^2(1) = 4.40$, $p < .05$.

The cost analysis included the cost of paper, appointment cards, lost revenue due to incentives, and the services of the nurse receptionist. The total cost for each of the four treatment conditions, was NTC, \$2.64; MAC, \$5.15; FF, \$234.64; and RR, \$106.64. The cost per individual in the study conditions was \$0.09 for NTC, \$0.17 for MAC, \$8.09 for FF, and \$4.09 for RR. The net revenue, which consists of subtracting the lost revenue from the gross revenue, indicated that the RR condition

generated more revenue (\$88.00) than either the NTC condition (\$80.00) or the MAC condition (\$64.00). Because office visits for the FF condition were free, no gross or lost revenue was expected.

Table 2 shows the results of the medical significance questionnaire. In general, the physicians noted that the incentive conditions were effective in reducing noncompliance to follow-up appointment keeping. Most of the HMO physicians indicated that they did not overbook to make up for no-shows. Given that 25% of the FPC patients did not participate in this research, it would have been surprising if the FPC physicians had spontaneously noted the level of changes in compliance to appointment keeping that actually occurred.

DISCUSSION

Noncompliance to follow-up appointment keeping was reduced at a family practice center. After determining the baseline level of noncompliance, the four treatment conditions produced different levels of noncompliance. The NTC data resembled the previous baseline data, whereas the incentive conditions produced significant decreases in noncompliance. However, the RR and NTC comparison was not statistically significant. The MAC condition produced a slight, but nonsignificant, increase in noncompliance. With the implementation of the RR as an extended follow-up condition, a statistically significant difference was found when it was compared with the previous NTC condition.

These findings replicate previous efforts with in-

centives (Iwata & Becksfort, 1981; Reiss & Bailey, 1982; Reiss et al., 1976) whereby a monetary rebate affected attendance at dentists' offices and fee reductions were made contingent on reductions of dental plaque.

The cost analysis suggested that the NTC and MAC conditions were the least expensive to implement, but they were also the least effective. The incentive conditions were more expensive to implement, but produced the most compliance. Most important, in looking at cost and income, the RR condition produced the largest net revenue, if missed office visits are assumed to mean lost revenue.

Finally, the questionnaire data on the importance of these results suggest that the physicians believed that the incentive conditions significantly reduced noncompliance to follow-up appointment keeping. The majority of the physicians indicated both an interest in reducing noncompliance and using incentives to do so. These questionnaire responses suggest that the results of the study were considered both meaningful and relevant.

It appears that the use of incentives in medical settings represents a useful strategy to reduce noncompliance to follow-up appointment keeping. From a practical perspective, the free follow-up condition is not a feasible strategy in settings where physicians derive income from the delivery of medical services. At the FPC, physicians did not directly derive their income from patient revenues. Thus, although some agencies may have the option to offer free follow-up appointments on a regular basis, most outpatient clinics would find it impractical. However, one implication from this research is that noncompliance decreases when incentives are offered contingent on follow-up appointment keeping. Therefore, it may be useful to program follow-up medical services that are either at reduced rate or free.

One disappointment was the poor compliance for the modified appointment card group. It was hoped that the card would act as a salient antecedent; that is, the bright yellow card with a red sticker would be a more effective prompt than the standard smaller appointment card. Our results do

not support this assumption, but do support the results of Morse, Coulter, Nazarian, and Napolitano (1981), who indicated that the attendance between a group of patients receiving no prompts and a group of patients receiving mailed prompts was essentially the same. Perhaps even modified appointment cards are necessary, but not sufficient, to increase attendance.

There are several methodological concerns worth noting. The limitations placed on data collection made it impossible to monitor directly whether or not the system was truly effective or efficient. For example, it was conceivable that patients could have circumvented the system by leaving the center after seeing the physician. This, of course, represents a potential sampling bias. Because access to patient files was not allowed, a comparison of group demographic characteristics was also impossible. There was no way to demonstrate if a sampling bias existed even for the patients who were included in the study.

Another concern was the lumping of both no-shows and cancelled appointments as noncompliance. In many situations the cancelled, but not rescheduled visit may not be interpreted as noncompliance (for example, the cancellation of a routine physical examination).

These results suggest numerous areas that could benefit from further research, such as a need for more evaluation of the reduced rate incentive. One question is whether the relationship between incentives and noncompliance is linear. For example, would a 25% cost reduction result in a similar rate of noncompliance? Also, at what percentage is the reduced rate cost-effective? To answer these questions parametric research could be implemented to examine noncompliance as a result of follow-up visit rate reductions of 0%, 25%, 50%, 75%, and 100%. Through an examination of respective noncompliance for each reduction, the question of linearity could be answered. Also, studies on the kinds of incentives that are the most effective would be useful. Thus, data on both quantitative and qualitative aspects of the use of incentives in medical settings would be available.

Another important concern is noncompliance for

patients who were not eligible for inclusion in this study, such as public welfare recipients who received free medical services. Such individuals have been demonstrated to be particularly recalcitrant no-shows, and the current research offers no solutions to this dilemma. Other patient groups not directly paying for medical services such as obstetric patients, clinic staff, and patients with prepaid medical insurance may also have been noncompliant.

The results of this research suggest that incentives appear to decrease noncompliance to follow-up appointment keeping and that the effectiveness of appointment cards needs further assessment.

Including the initial baseline data, approximately 300 patients were involved in this study, covering a 16-month period. The large sample and the extended duration of the research suggest that the results are not due to sampling error, but reflect real differences among the conditions. By providing incentives for follow-up appointment-keeping compliance, patients received the necessary medical treatment as prescribed by the physician. Consequently, the delivery of efficient medical services was maximized, and the potential negative consequences for failing to attend prescribed follow-up appointments were avoided.

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