NICOTINE GUM AND SELF-HELP MANUALS IN SMOKING CESSATION: AN EVALUATION IN A MEDICAL CONTEXT

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Abstract — This study evaluated the effectiveness of nicotine chewing gum in smoking cessation, when incorporated into a behaviorally oriented self-help program. One hundred ninety-seven patients were randomly assigned to nicotine gum with a self-help manual, a self-help manual without gum, or a control condition, but received no further treatment from the prescribing physician. At six weeks, the nicotine gum group was superior to both the self-help and control conditions. By one year, many gum patients had relapsed, and the treatment effect was no longer significant. Patients who were able to quit initially were most likely to remain ex-smokers in the self-help condition. The clinical importance of these findings is discussed.

Recent developments in smoking cessation research suggest that physicians can influence the smoking behavior of their patients in many ways (U.S. Department of Health and Human Services, 1984). While their advice to quit may itself be effective (Russell, Wilson, Taylor, & Baker, 1979), they can also administer treatments that will help patients act on that advice. Thus it may be possible to provide both the motivation and means for stopping smoking.

The fact that many smokers have successfully stopped smoking without benefit of formal treatment programs (Horn, 1972; Public Health Service, 1978; Schachter, 1982) has stimulated interest in the process of self-change (Prochaska & DiClemente, 1983). Self-help manuals with clear behavioral guidelines and cognitive strategies that patients can use on their own may enable them to quit with minimal external involvement (Glasgow & Rosen, 1978; U.S. Department of Health and Human Services, 1982). Self-help treatment programs are simple enough that health care providers could use them routinely in medical practice. The time commitment is minimal — the physician simply provides the external prompt that facilitates self-change.

Another technique with great promise is nicotine chewing gum, which is intended to help smokers overcome their dependence on nicotine (Hughes & Miller, 1984; McNabb, Ebert, & McKusker, 1982). Nicotine gum is now available by prescription and should provide an excellent resource to physicians who want to offer their patients pharmacological help in quitting smoking. Previous studies have compared nicotine gum with placebo gum and found significant effects for the active ingredient of nicotine (Hjalmarson, 1984; Jarvik & Schneider, 1984; Jarvis, Raw, Russell, & Feyerabend, 1982; Schneider, Jarvik, Forsythe, Read, Elliot, & Schweiger, 1983). It

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has proven effective in smoking cessation, in studies where it was offered as an adjunct to standard treatment given in smoking clinics (usually in the form of classes or group meetings) (Fagerstrom, 1982; Jarvis et al., 1982; Schneider et al., 1983).

Two studies conducted in medical clinics have examined the effectiveness of nicotine gum in conjunction with physician advice and written materials (information about smoking and how to stop [British Thoracic Society, 1983]; a “Give up smoking” booklet [Russell, Merriman, Stapleton, & Taylor, 1983]), with mixed results. In both studies, the written material (which was not an integral component of the gum treatment program) reinforced the physician’s advice to quit, but did not include a detailed self-help program. The low quit rates in these two studies may reflect the absence of psychological treatment.

Pharmacological and self-help treatment can be combined in one program by providing nicotine gum with a detailed self-help manual that includes guidelines for gum usage. This type of treatment would be particularly appropriate in medical contexts, where more comprehensive psychological treatment is unavailable. Quit rates may be lower than in smoking clinics where treatment is more intensive, but physicians may still be able to achieve meaningful change with a brief intervention. No study to date has evaluated the effectiveness of nicotine gum when presented as one component of a broad, behaviorally oriented self-help program.

In this study, physicians prescribed nicotine gum to patients, and gave them a self-help booklet. The psychological self-help program was specifically developed to incorporate gum usage as one of several behavioral strategies to use in stopping smoking. The treatment was self-administered, with no further involvement on the part of medical personnel.

We focused on two distinct stages of cessation: quitting initially, and remaining an ex-smoker. Recent research indicates that these are separate processes, and that treatment programs may be differentially effective for each stage (Prochaska & DiClemente, 1983). In the case of nicotine gum, for example, patients may be able to stop smoking while chewing the gum, but may have difficulty in maintaining cessation once they stop using it. We examined initial cessation and maintenance separately, in addition to evaluating the overall effects of the treatment programs at a one year follow-up.

METHOD

Subjects

One hundred and ninety-seven smokers enrolled in the project. They were recruited from the patients and staff of a university medical center (n = 76) and a university campus health service (n = 121). The sample was 37% male, and 63% female; ages ranged from 18 to 76, with an average age of 36. Patients smoked an average of 26.5 cigarettes per day (range: 10–75) when they entered the study. On the average, they started smoking when they were 16, and they had been smoking for 17 years.

Procedure

The study was conducted in two clinical sites, the Associates in Internal Medicine group practice at Columbia Presbyterian Medical Center, and at Columbia University Health Services, on the Columbia University campus. A new smoking cessation treatment program was offered without cost to patients eligible to use the medical facilities. Although many patients were referred to the program by their personal
physician, participation was voluntary in all cases. Patients interested in the program reported to the clinic for an appointment with a doctor or a nurse under the supervision of a doctor, and were screened for the following exclusion criteria: recent myocardial infarction, unstable angina pectoris, uncontrolled hypertension, peripheral vascular disease, peptic ulcer disease, pregnancy or lactation, difficulty in chewing, recurrent mouth sores, active temporomandibular joint disease, acute dental infection, chronic hemodialysis, or hepatitis. When this study was conducted, nicotine gum was an investigational drug, and these exclusion criteria were required by the FDA. To ensure random assignment to treatment condition, patients for whom gum was contraindicated had to be excluded from the study.

Following this exclusion procedure, patients who passed were randomly assigned to one of three conditions: (a) Gum: nicotine chewing gum (Nicorette) with self-help manual (n = 99); (b) Self-Help: self-help manual only (n = 52); and (c) Control: a short booklet only, with tips for stopping smoking (n = 46). Two doctors and one nurse administered treatment in this study; they each provided all three treatments. In all conditions, the doctor or nurse advised the patient to stop smoking by following the guidelines in the manual. Patients were told about the side effects they might experience in quitting (e.g., weight gain, irritability), and were encouraged to return if they experienced any adverse reactions.

When nicotine gum was prescribed, the physician or nurse explained how to use it, and described some side effects (e.g., nausea, jaw muscle ache). They discussed usage generally (e.g., when to chew, when to start tapering off the gum), and gave the patient a printed list of instructions (guidelines provided by the manufacturer). Patients were also advised that they would find more detailed guidelines in their self-help manual (see below). Patients then chewed one piece of gum under supervision, and then received a six-week supply of gum (six boxes of 105 pieces each). They were not limited as to the amount of gum they could chew, and they were instructed to return to the medical clinic for more gum when needed. Additional supplies of gum were freely dispensed for six months. If patients requested gum later than six months after intake, they were required to discuss their needs with a physician. They were urged to reduce their usage, but were given more gum on request.

Patients were informed that because the treatment programs were experimental, their progress would be monitored for one year by researchers who operated independently of the medical staff. Informed consent was obtained from all participants, following the guidelines of the Institutional Review Board of Columbia University. Research group members (who were blind to treatment condition) escorted patients to a separate office, where they conducted a smoking history interview. Patients also completed the Fagerstrom Tolerance Questionnaire, which asks eight questions about smoking patterns (e.g., whether the patient smokes within 30 minutes of waking up, and the difficulty of refraining from smoking where prohibited or when ill) (Fagerstrom, 1978).

Each patient was paid $7.00 in partial compensation for expenses related to the research interview, and told that they would receive $7.00 for each subsequent visit. These payments were specifically for participation in the research project, and were used to encourage attendance at follow-up visits.

There were originally two different gum conditions, which differed only in the motivational orientation of the accompanying self-help manuals (cf., Harackiewicz, Sansone, Blair, Manderlink, & Epstein, 1987). Patients in these two groups did not differ in terms of gum usage, side effects, smoking cessation, or maintenance. Accordingly, the two groups (n = 52 and n = 48) were combined for simplicity of presentation.
Treatment programs. Treatment was self-administered in all conditions (Gum, Self-Help and Control). Patients received a take-home manual with information about smoking and guidelines for quitting. The manuals (Harackiewicz, Sansone, & Manderlink, 1982) were written from the perspective of a physician giving advice to his or her patient. All booklets outlined a three-month program in which smokers would quit "cold-turkey" after a few days of preparation.

Behavioral guidelines. In the control condition, guidelines for quitting were minimal; the booklet contained only general information about smoking and brief tips. In the Self-Help and Gum programs, the guidelines were more detailed, utilizing some of the basic techniques found in existing self-help manuals (American Cancer Society, 1977; Danaher & Lichtenstein, 1978). Patients first were urged to spend a few days clarifying their smoking patterns and considering their reasons for quitting. To facilitate this process, charts were provided for recording when and why cigarettes were smoked during this preparation period. Patients were then advised to set and prepare for a "quit date," on which they would stop smoking completely. The manuals outlined various coping strategies for controlling smoking urges (e.g., thinking about the benefits of not smoking, finding substitute activities). In the Gum condition, the manual outlined another coping strategy: chewing nicotine gum (see below). After quitting, all patients were to record instances when they conquered an urge to smoke (on charts provided with the manual) in order to learn which coping strategies were most effective for them. A section on "slips" emphasized that if they smoked, they should identify the causes of their relapse, and use the appropriate coping strategies when similar situations arose. The manuals in the Self-Help and Gum conditions were identical except for directions pertaining to nicotine gum.

Instructions for gum usage. Gum patients were instructed to chew a piece of gum when they felt an urge to smoke. The guidelines encouraged patients to anticipate smoking situations (e.g., work breaks) and begin chewing before smoking urges developed. Charts were provided for monitoring the conditions under which the gum was chewed. Patients were instructed to gradually eliminate the use of the gum approximately three months after their quit date. While they were tapering off the gum, they were to continue using behavioral and cognitive coping strategies to resist the urge to smoke. These directions were integrated into the self-help program.

Follow-up visits. The first of five follow-up visits occurred approximately six weeks after the initial interview. The other visits took place at three month intervals from the medical appointment, and a breath sample was collected at each visit (for carbon monoxide analysis). Saliva was collected for thiocyanate analysis at three and six months, as an additional objective measure of smoking status. After six months, patients who had never stopped smoking were not encouraged to return for interviews, although contact was maintained by telephone and correspondence. During each visit, patients were questioned about their smoking status. Patients in the gum condition were questioned about their reactions to the nicotine gum and their gum usage (amount chewed per week and reduction patterns).

Study sample

One hundred seventy-five patients accepted treatment and returned for at least one interview. Twenty-two of the original 197 patients failed to return for any follow-up interviews. Dropout rates did not differ according to condition, and there were no significant differences between the dropouts and the 175 subjects on any
measure collected at intake. Therefore the basic study sample included 90 patients in the nicotine gum condition, 47 in the self-help condition, and 38 in the control group. All of these patients were interviewed six weeks after the medical visit, and their continued smoking status is represented in all data analysis. Those who did not return for later visits were assumed to be smoking.

RESULTS

Measures

Nicotine dependence. Scores on the Tolerance Questionnaire could range from 0, indicating minimal nicotine dependence, to 11, indicating a high level of nicotine dependence (Fagerstrom, 1978). The mean score for our sample was 6.12 (SD = 1.93). Forty-two percent of the patients scored above 6, with 58% scoring 6 or below, and patients were classified as low (0-6) or high (7-11) in nicotine dependence for subsequent analyses. This distribution is comparable to that found in previous research (Fagerstrom, 1982; Jarvik & Schneider, 1984). Although the validity of this measure has recently been challenged (McNabb, 1985), nicotine dependence was significantly correlated with expired carbon monoxide at intake (r = .33, p < .01) and baseline cigarette consumption (r = .40, p < .001) in this sample.

Smoking status. The patients' self-reports of smoking behavior at each interview were used to measure smoking status. We attempted to collect objective measures at all visits, but equipment failures and the necessity of conducting many later interviews by telephone and correspondence were limiting factors. There were 166 reports of cessation from 58 patients, and we collected objective measures (expired CO or saliva) for 114 (69%) of them. Ninety-five percent of these reports appeared to represent the patient's true status, as indicated by their CO (< 8 ppm) and/or SCN (< 10 mg/dl) level. As a result, six self-reports (from two patients) were considered invalid, and they were treated as smokers in the analyses reported below.

Maintenance of cessation. We followed up all ex-smokers for a minimum of 46 weeks after their initial success. To measure maintenance, we computed the number of weeks (out of 46) that patients remained abstinent after the interview in which they

2In this study, patients were unaware of the type of treatment they would receive from medical personnel, and some came into the program expecting "more" than a self-help manual. Many of the dropouts were dissatisfied with the self-help nature of treatment. Although no patient refused treatment from medical personnel, many expressed dissatisfaction with the treatment offered, and telephone conversations with the dropouts suggested that they did not use the treatment provided. In the absence of follow-up data, these patients are best characterized as rejecting the treatment offered.

3Follow-up data was available from 136 (78%) patients at three months, and from 115 (66%) at six months. At nine and twelve months, we conducted 91 (52%) and 72 (41%) interviews, respectively. These percentages are somewhat misleading because patients who were unsuccessful with the program (and who indicated that they had given up on it) were not encouraged to return after six months. Of those patients who indicated that they were still trying to quit at six months (n = 40), or who had quit during the treatment period (n = 56), follow-up data was available from 74% at one year.

4We were able to provide satisfactory validation for the overall reporting of 95% of the 39 patients who reported not smoking at two or more visits during the year-long assessment period. Of these patients, we were able to validate all of the cessation reports for 14 patients, and at least half for 21 patients. Of the remaining four, validation was available for the most recent report of non-smoking for two patients (one at one year; one at six months). Satisfactory validation was unavailable for only two patients: both reported not smoking at six weeks and three months, and relapsed at six months. Furthermore, we always collected breath samples and saliva (at 3 and 6 months) from patients, who were unaware of the technical problems that sometimes rendered the measures invalid. Since patients reported their status before these measures were collected, and expected that these measures would reveal their true status, self-reports of status may have been more veridical (Bliss & O’Connell, 1984; Jones & Sigall, 1971).
Table 1. Percent quit over time

<table>
<thead>
<tr>
<th>Treatment Condition</th>
<th>6 wks</th>
<th>3 mo</th>
<th>6 mo</th>
<th>9 mo</th>
<th>12 mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicotine Gum</td>
<td>n = 90 (n = 99)</td>
<td>42 (38)</td>
<td>21 (19)</td>
<td>16 (14)</td>
<td>13 (12)</td>
</tr>
<tr>
<td>Self-Help</td>
<td>n = 47 (n = 52)</td>
<td>19 (17)</td>
<td>23 (21)</td>
<td>19 (17)</td>
<td>15 (13)</td>
</tr>
<tr>
<td>Control</td>
<td>n = 38 (n = 46)</td>
<td>11 (9)</td>
<td>8 (7)</td>
<td>8 (7)</td>
<td>8 (7)</td>
</tr>
<tr>
<td>Overall</td>
<td>N = 175 (N = 197)</td>
<td>29 (26)</td>
<td>19 (17)</td>
<td>15 (13)</td>
<td>13 (11)</td>
</tr>
</tbody>
</table>

Note. Since the treatment period lasted three months, this table includes individuals who had stopped smoking by three months, but had been unsuccessful at six weeks (3 in the Self-Help condition; 2 in the Control condition). After three months, however, patients were only considered abstinent if they had remained so continuously. N’s and percentages in parentheses include the 22 dropouts.

first reported themselves as not smoking (Weeks Abstinent). Patients were credited with maintenance through the last visit in which they were not smoking. Scores on this measure varied from 0 (indicating a relapse reported at the next follow-up visit) to 46 weeks (indicating continued abstinence through the 46-week follow-up), with an overall mean of 19.62 (SD = 20.78).

Treatment effects on cessation and maintenance

Quit-rates. Table 1 presents the percentage of patients who were not smoking within each condition at each point in time. Five patients who had not stopped smoking by six weeks were successful at three months. Since the treatment period was projected to last three months, these patients were counted as ex-smokers at three months in Table 2. After the three-month treatment period, however, patients who had quit were only considered abstinent if they had remained so continuously. Quit-rates are based on the entire population, collapsing across medical personnel (two doctors, one nurse) and intake site (i.e., medical center and university health clinic). There were no significant site, personnel, or gender differences in the percent abstinent across or within conditions, at any point in time. All percentages are recomputed (in parentheses) to include the 22 dropouts, who were assumed to be smoking. All of the statistical analyses reported in this paper were performed on the

Table 2. Maintenance of cessation:
Means for weeks abstinent

<table>
<thead>
<tr>
<th>Level of Nicotine Dependence</th>
<th>Treatment Condition</th>
<th>Self-Help</th>
<th>Gum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td></td>
<td>40.05</td>
<td>10.55</td>
</tr>
<tr>
<td>(N = 22)</td>
<td>SD = 10.41</td>
<td>n = 6</td>
<td>n = 16</td>
</tr>
<tr>
<td>High</td>
<td></td>
<td>19.57</td>
<td>20.67</td>
</tr>
<tr>
<td>(N = 28)</td>
<td>SD = 20.68</td>
<td>n = 6</td>
<td>n = 22</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>29.81</td>
<td>16.41</td>
</tr>
<tr>
<td>(N = 50)</td>
<td>SD = 18.92</td>
<td>n = 12</td>
<td>n = 38</td>
</tr>
</tbody>
</table>

Note. Weeks abstinent is the number of weeks a patient continuously remained an ex-smoker after quitting initially.
quit-rates for the basic study sample, however, which excludes the 22 dropouts ($n = 175$).\(^5\)

**Initial cessation.** At six weeks, the effect of treatment condition was highly significant, $\chi^2 (2) = 16.11, p < .001$. There was a clear advantage of having nicotine gum as part of the treatment program: gum patients were significantly more likely to have stopped smoking (42% abstinent) than patients in the control condition (11%), $\chi^2 (1) = 12.18, p < .001$, and than patients in the Self-Help condition (19%), $\chi^2 (1) = 7.29, p < .01$.\(^6\) There was a significant effect of nicotine addiction showing that across treatment conditions, nicotine-dependent individuals were less likely to have quit at six weeks (20%) than individuals low in nicotine dependence (35%), $\chi^2 (1) = 4.48, p < .05$.

**Effects at one year.** The effect of treatment was not statistically significant ($p > .25$), although the overall quit-rates for the Gum group (13%) and Self-Help group (15%) were higher than the control group (8%). The overall effect of nicotine dependence was significant at one year $\chi^2 (1) = 5.73, p < .05$. For low-dependent individuals, 18% had successfully quit. For those high in nicotine dependence, however, only 6% were not smoking.

**Maintenance.** To compare the effectiveness of the Gum and Self-Help treatments for maintenance, we examined the effects of treatment condition (Gum vs. Self-Help), and nicotine dependence (low vs. high) in a $2 \times 2$ analysis of variance on Weeks Abstinent.\(^7\) Table 2 shows the Weeks Abstinent means for the 50 patients who were able to quit initially, by treatment condition and level of nicotine dependence. The main effect of treatment condition was significant, $F(1, 46) = 4.86, p < .05$, indicating that patients in the Self-Help group remained ex-smokers longer ($X = 29.81$ weeks) than patients who had quit using the Gum program ($X = 16.41$ weeks). The main effect of Nicotine Dependence was not significant, but there was a significant interaction between Treatment Condition and Nicotine Dependence, $F(1, 46) = 5.63, p < .05$. This effect showed that patients who had quit in the Self-Help condition remained ex-smokers longer if they were lower in nicotine dependence, whereas in the Gum condition, maintenance was better for nicotine-dependent individuals (See Table 2).

**Gum usage**

**Side effects.** The three most common side effects reported in the nicotine gum condition were oral soreness (34%), upset stomach (23%), and nausea (17%). The most common side effects reported at six weeks and three months are shown in Table 3, with percentages computed separately for gum and no-gum (Self-Help and Control combined) patients. Twenty-four gum patients (27%) reported that they had

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\(^5\)All statistical analyses were repeated for the entire population ($n = 197$); the significance levels for the relative differences between the treatment groups were virtually identical. Including the dropouts simply lowers the quit-rates in all conditions. Consequently, conclusions about the relative effects of the treatments are unaffected by the inclusion of the 22 dropouts.

\(^6\)Five patients in the Self-Help and Control conditions had not quit by six weeks, but had quit by three months, suggesting that self-help programs without gum took longer to achieve their peak effectiveness. At three months, the quit-rate for the Self-Help condition (23%) was significantly higher than in the control condition (8%), indicating that the behavioral program was effective in the early stages of smoking cessation.

\(^7\)The Control group was excluded from this analysis because of the small number of ex-smokers in this condition.
stopped chewing the gum because they were unable to tolerate its side effects. Very few patients (5%) returned to discuss these side effects or gum usage with the medical staff.

**Patterns of gum usage.** Eight of the 90 gum patients chewed less than ten pieces before stopping and giving up on the program. The remaining 82 patients, who used the nicotine gum, reported chewing from 1 to 105 pieces of gum per week at their six-week interview (X = 46.17). At one year, eight patients (9% of the original 90) were still using the gum. This figure may underestimate continued use of the gum, because some patients (who were still chewing when last interviewed) failed to return for subsequent follow-ups, and there is no way to determine when (or if) they stopped chewing. Table 4 summarizes these usage patterns. It is important to note that many patients continued to chew the gum without ever stopping smoking. At six weeks, 41% of the gum patients were smoking and chewing, and at one year, 7% of gum patients continued to smoke and chew the gum. Most of these patients claimed to be smoking at a reduced rate.

**Tapering patterns of successful quitters.** At one year, 12 patients in the gum condition were not smoking, but two reported still using the nicotine gum at their

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**Table 3. Percentage of patients reporting side effects**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>6 weeks</th>
<th>3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral soreness</td>
<td>34* (4)</td>
<td>18* (1)</td>
</tr>
<tr>
<td>Stomach/GI symptoms</td>
<td>23* (8)</td>
<td>12* (0)</td>
</tr>
<tr>
<td>Nausea</td>
<td>17* (6)</td>
<td>10* (1)</td>
</tr>
<tr>
<td>Jaw muscle ache</td>
<td>16* (0)</td>
<td>7* (0)</td>
</tr>
<tr>
<td>Mouth ulcers</td>
<td>9 (2)</td>
<td>1 (0)</td>
</tr>
<tr>
<td>Lightheadedness</td>
<td>9 (12)</td>
<td>11 (4)</td>
</tr>
<tr>
<td>Hiccups</td>
<td>8 (1)</td>
<td>7 (0)</td>
</tr>
<tr>
<td>Headache</td>
<td>6 (8)</td>
<td>3 (2)</td>
</tr>
</tbody>
</table>

*Note. First percentage is for gum patients (n = 90); second (in parentheses) is for patients in Self-Help and Control conditions combined (n = 85).

*Gum group differs significantly (p < .05) from no-gum groups.

**Table 4. Patterns of gum usage and tapering**

<table>
<thead>
<tr>
<th>Number of gum patients who:</th>
<th>6 wks</th>
<th>3 mo</th>
<th>6 mo</th>
<th>9 mo</th>
<th>12 mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Had stopped using the gum</td>
<td>21</td>
<td>10</td>
<td>10</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>by this visit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Were still using the gum</td>
<td>69</td>
<td>51</td>
<td>39</td>
<td>22</td>
<td>8</td>
</tr>
<tr>
<td>at this visit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent who report still</td>
<td>77</td>
<td>57</td>
<td>43</td>
<td>24</td>
<td>9</td>
</tr>
<tr>
<td>chewing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average amount of gum (#</td>
<td>46.17</td>
<td>46.16</td>
<td>33.25</td>
<td>22.86</td>
<td>10.88</td>
</tr>
<tr>
<td>pieces) chewed per week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. These percentages are based on the 90 patients who were prescribed nicotine gum and returned for at least one follow-up visit. Eighteen patients who did not return for the one-year interview were still using the gum when they were last interviewed (8 at six weeks, 2 at three months, 5 at six months and 3 at nine months), but they are not counted as still using the gum in this table beyond the point of their last interview. If these 18 patients are considered to be chewing at one year, the percent still using the gum would be 29%.
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Of the 10 patients who quit smoking by using the gum, and who had stopped chewing by one year, two had stopped chewing by six weeks, two by three months, two by six months, two by nine months, and two did not stop until just prior to their one-year follow up visit. Thus only half of the successful quitters had stopped chewing by six months.

DISCUSSION

Nicotine gum, paired with a detailed self-help manual, was quite effective in helping many patients stop smoking initially. The manual provided psychological treatment (behavioral guidelines and cognitive strategies) in a self-help format. The program was easy to administer, and allowed the prescribing physician to concentrate on the pharmacological aspect of treatment. Although not statistically superior to the control group at one year, the quit-rate (13%) compares favorably with those found in three other studies where nicotine gum was dispensed without psychological intervention (8–10%) (British Thoracic Society, 1983; Russell, Merriman, Stapleton, & Taylor, 1983; Schneider et al., 1983). Patients in this study volunteered for treatment, and were presumably motivated to quit. The study sample was therefore more comparable to clinic studies (Jarvis et al., 1982; Schneider et al., 1983) than to general practice studies (British Thoracic Society, 1983; Russell et al., 1983) where quit-rates tend to be lower.

Some authors have suggested that nicotine gum needs to be prescribed in the context of more comprehensive psychological treatment to be effective (Hall & Killen, 1985; Schneider et al., 1983). Indeed, quit-rates with nicotine gum are higher in studies where it is prescribed as an adjunct to psychological therapy (e.g., 29–49%) (Fagerstrom, 1982; Jarvis et al., 1982; Schneider et al., 1983). However, health care practitioners are unlikely to have the time or resources to provide intensive behavioral therapy, and simpler approaches (with lower success rates) may be more practical. If smoking treatments are more likely to be prescribed when they are straightforward and require little physician involvement, self-help programs may be particularly effective in medical contexts. Russell has suggested that physicians in general practice will reach many more smokers than will psychologists in smoking clinics, resulting in a higher yield of ex-smokers, even if their procedures are less effective (Russell et al., 1983; Russell et al., 1979). From this perspective, our results are quite encouraging regarding the number of smokers who may benefit, in the short term at least, from physician-provided self-help programs.

Although we found impressive quit-rates with the gum in the early stages, many patients relapsed relatively quickly. By one year, patients who received nicotine gum were not significantly more successful than those in the control group. Three kinds of problems interfered with effective gum usage over the course of the year: side effects, problems in tapering, and continued chewing. Many of our patients (27%) stopped using the gum because they were unable to tolerate its side effects (oral soreness and gastrointestinal problems).

Gum patients who were able to stop smoking by six weeks seemed to have problems around the third month of the program, when they were supposed to begin tapering off the gum. At three months, many patients had given up on the gum and returned to smoking, and the success rate dropped from 42% to 21% during this difficult transition period. Other patients were unable to taper off the gum, continuing to chew well past the recommended tapering date. In fact, almost half of the gum patients were still chewing the gum at six months. Particularly disturbing is the fact
that many patients were chewing and smoking at the same time. Despite strong recommendations to taper off the gum, continued chewing persisted throughout the year. It is unclear whether continued gum usage should be considered a problem, since little is known about the long-term effects of chewing nicotine gum, and because most researchers do not consider addiction a serious problem (Hughes & Miller, 1984). However, until more is known, we recommend that patients be encouraged to reduce their chewing within six months, and that any continued usage be monitored carefully. The incidence of the three problems identified here may be reduced if physicians actively monitor their patients’ progress, and schedule follow-up visits soon after prescribing the gum (to discuss side effects and proper chewing techniques), and three months later (to discuss plans for tapering).

Nicotine dependence proved to be an important predictor of success in quitting, both initially and at one year. Nicotine-dependent smokers were less successful in stopping smoking, no matter what treatment they received. However, nicotine gum was particularly effective in promoting continued cessation for individuals who were highly dependent on nicotine. In contrast, low-dependent individuals who had quit with nicotine gum relapsed sooner than dependent individuals. Patients who are not as addicted to nicotine may be better able to quit initially, with nicotine gum, or any other treatment, but they find the gum less helpful in remaining ex-smokers. Dependent smokers, on the other hand, have a harder time quitting initially, but if they do manage to quit, they are more likely to benefit from the gum over the year. These smokers may require more intensive treatment at the outset to help them stop smoking and begin chewing the gum instead. They might benefit from a longer initial session, in which the physician recognizes the patient’s level of nicotine dependence, or from a follow-up visit to discuss gum usage and plans for tapering. With more support, dependent smokers might be able to stop smoking, and remain successful with the use of nicotine chewing gum.

Many patients in this study were able to stop smoking with the aid of the Self-Help program. Although it was less effective than the gum in promoting cessation at six weeks, it proved to be impressive in maintenance — those who were able to quit with it remained abstinent longer over the course of the year. In this respect, the self-help program was superior to the gum program. Simple self-help manuals may be an effective treatment option for some patients, allowing physicians to “tailor” the type of assistance offered according to individual characteristics. For example, they might give a self-help manual to those who are low in nicotine dependence. Such programs might also be useful when patients are dissatisfied with the gum, or when the gum is contraindicated for medical reasons.

Thus one type of treatment (nicotine gum) was particularly effective for initial cessation, whereas another (Self-Help) was optimal for maintenance, resulting in comparable quit rates at one year. Although gum patients had received identical self-help guidelines, it appears that they relied too heavily on the gum, and did not utilize the psychological program effectively. By examining the processes of initial cessation and maintenance separately, we were able to identify some of the problems associated with nicotine gum, and make recommendations for its more effective usage. The results of our study are consistent with other findings that suggest that nicotine gum provides an initial pharmacological advantage in achieving cessation, but that a concentrated behavioral program may be necessary to sustain abstinence in the long term (Hall & Killen, 1985; Schneider & Jarvik, 1985). Further research is
necessary to determine how nicotine gum may be better integrated into effective behavioral programs.

Our results suggest that physicians can influence smoking behavior (at least in the short term) with a simple, one-time intervention that takes about 15 minutes. Of course, physicians might achieve more success if they provide continued support and monitor the progress of their patients. The self-help treatments evaluated here are simple enough to be incorporated into the busiest of medical practices. These programs can be supplied when smokers ask for help in quitting, and they can be offered as a follow-up to anti-smoking advice. With them, physicians may be able to reach many people who would not otherwise stop smoking.

REFERENCES


