

situations. The 12 high-arousal items involved either emotional strain and anxiety or demanding mental activity; the ten low-arousal items concerned boredom and relaxation or repetitive tasks and physical fatigue. A factor analysis of the entire questionnaire and t-tests performed on male versus female scores for the most extreme situations on the continuum led Frith to state that men had a greater desire to smoke in situations inducing boredom and tiredness and women had a greater desire to smoke in stress-inducing situations. However, men rated the desire to smoke significantly higher than did women on all three of the questions representing low-arousal situations, whereas women rated the desire to smoke significantly higher on only one of the three questions representing the high-arousal extreme of the continuum (69).

Using Frith's questionnaire, Barnes and Fishlinsky were unable to replicate his findings in a sample of Canadian undergraduates (12). Within the male sample, there was no significant relationship between desire to smoke and the arousal value of the situation in the question, and female subjects indicated a greater desire to smoke in the low-arousal situations. The authors point out the possible importance of sampling differences.

Elgerot studied light, medium, and heavy smokers in an attempt to control potential differences in inhalation patterns between men and women (cited by Frith as a possible explanation for his results) (57). Subjects were Swedish university students. The 42-item questionnaire was similar, but not identical, to Frith's. There was no gender difference for low-arousal situations. There was no sex difference in the light and medium smoker subgroups, but women in the heavy smoker subgroup expressed a greater desire to smoke in stress-inducing circumstances.

Russell and his colleagues devised a 34-item questionnaire covering a wide variety of smoking motives. It was administered to 175 normal smokers and then subjected to factor analysis (160). Six factors, representing six types of smoking, were identified. Women scored significantly lower on what was termed "sensorimotor" smoking, and significantly higher on "sedative" smoking. Thus, the sex difference on "sedative" smoking (reduction of arousal) was supported.

Ikard and Tomkins (96) found evidence that women smoke in situations involving negative affect. Negative affect smoking is defined as smoking which serves to reduce unpleasant feelings. It includes smoking to reduce the dysphoric feelings accompanying rejection by a social group as well as smoking to satisfy a craving for a cigarette (i.e., deprivation negative affect). Positive affect smoking involves the arousal of pleasant feelings.

For example, smoking from curiosity would be classified this way because of the feelings of excitement and interest generated. Ikard and Tomkins showed two films, one intended to evoke positive affect (a slapstick comedy), and another to evoke negative affect (a documentary on Nazi atrocities) to college students who smoke. To be characterized as either positive- or negative-affect smokers, the subjects had to smoke during the appropriate film and indicate a congruent mood on an affect checklist. The major finding was that 73 percent of the female sample of 15 subjects exhibited solely negative-affect smoking compared to only 36 percent of the sample of 39 males. While 80 percent of the females indicated that they were likely to smoke in positive as well as negative-affect conditions, their behavior did not match the self-report in this experiment. It is difficult to determine if the environment of the experiment altered normal behavior patterns, or if perhaps smokers are not accurate in describing the types of situations in which they smoke.

Nationwide surveys conducted in 1964, 1966, and 1970 also suggested that a higher percentage of women than men are negative-affect smokers and that little or no difference exists between men and women in the percentage who are positive-affect smokers (192,193). A greater percentage of women current smokers endorsed the statement, "It relaxes me." (192). This supports the hypothesis that reduction of negative affect is a more important factor for women smokers. The statements assessing positive-affect smoking did not show a clear gender difference. In 1964, slightly more men than women endorsed the statement "enjoys it" as a reason for smoking, but in 1966 there was no difference between sexes and in 1970 slightly more female than male current smokers agreed that "cigarettes are pleasurable" (79.6 percent of women versus 77.0 percent of men).

To summarize: smoking affects arousal; it is not known whether women smoke to maintain a given arousal level, to change that level, or to adjust a physical blood level of nicotine. There are a number of studies which suggest that women use cigarettes more in high-arousal situations than do men. Studies which combine self-report with experimental situations providing a good approximation of natural smoking conditions are needed to shed some light on the validity of evaluation by questionnaire alone.

Smoking Cessation

There is an assumption in the treatment literature that men have greater success than women in quitting smoking. The

basis of this assertion lies partially in the demographic analyses of cessation rates and partially in the literature on smoking cessation clinics and experimental programs.

This section presents the results of both demographic and experimental analyses of smoking cessation. A critical appraisal is made of the relative success of men and women in giving up smoking and in remaining ex-smokers. Psychosocial and behavioral factors relating to abstinence and difficulties encountered in quitting are discussed. Finally, recommendations are presented for treatment and future research.

DEMOGRAPHICS

The quitting rates of smokers are calculated by dividing the number of former smokers by the number of ever smokers within each relevant demographic category. The following statistics are taken from the 1975 U.S. Department of Health, Education, and Welfare (USDHEW) survey on Adult Use of Tobacco (194). Former smokers are defined as those who once smoked but no longer do so. The term "former smokers" includes both those who have quit on their own and those who have received outside help. Quitting rates of women lag behind those of men, for each category reviewed.

Age

The USDHEW tables divide adult age groups into six categories: ages 21 to 24, 25 to 34, 35 to 44, 45 to 54, 55 to 64, and 65 and over (194). There is a trend toward increasingly larger percentages of former smokers in each successive age group for both men and women. However, within each age group, the percentage of smokers who have quit is higher for men than it is for women. For example, in the youngest age category, the percentage of female smokers who have quit is 22.6 percent while that for males is 27.9 percent. For a middle-aged category (45 to 54), the female and male percentages are 32.0 percent and 46.7 percent respectively. In the oldest age group, 51 percent of female ever smokers are former smokers, whereas the percentage is 60 percent for males. Bosse and Rose state that the sex differences in quitting are vanishing at younger ages, but Dicken argues persuasively that the absolute amount of convergence is small, and that men remain substantially more likely to stop smoking than women (21,45).

Education

Higher levels of education are associated with higher rates of quitting for both men and women. Among those with a college

TABLE 8.—Most frequently endorsed reasons for resuming smoking: Fall 1964 and Spring 1966 household interview survey, responses of current smokers

Q: People give all sorts of reasons for either not being able to or not wanting to stay off cigarettes. What were your reasons for going back to cigarettes? (Asked if made a serious attempt to stop smoking.)

		Current Smokers			
		1964		1966	
		N	%	N	%
Selected total	M	705	55.7	772	54.9
	F	542	50.6	588	57.1
No will power	M	291	23.0	278	19.8
	F	209	19.5	191	18.5
It relaxes me	M	212	16.8	181	12.9
	F	245	22.9	192	18.6
Enjoys it	M	144	11.4	123	8.7
	F	102	9.5	90	8.7
Helps keep weight down	M	65	5.1	40	2.8
	F	75	7.0	57	5.5
Smoke to be sociable	M	98	7.7	43	3.1
	F	70	6.5	46	4.5

NOTE: More than one answer was allowable for each respondent.
SOURCE: U.S. Department of Health, Education, and Welfare (1972).

education or higher, 52.1 percent of the men and 48.1 percent of the women who have ever smoked have quit. For all other levels of education, 40.5 percent of men smokers and 31.3 percent of women smokers have given up smoking. Although the discrepancy is less in the most advanced education category, the percentage of female quitters is smaller at both levels of schooling.

Income

Higher levels of income are associated in both sexes with higher rates of cessation. For those ever smokers with incomes under \$10,000, the rates of quitting for men and women are 34.7 percent and 30.3 percent respectively. For those with incomes of \$10,000 or above, the rates are 45.7 percent for men and 36.2 percent for women. Quitting rates of men exceed those of women for all but one (\$5,000 to \$7,499) of the seven income levels.

Occupation

There is a difference of only 7.6 percentage points between the proportion of male and female quitters in the category of pro-

professional, technical, and kindred workers, with the male quitting rate at 49.4 percent and the female quitting rate at 41.8 percent. A dramatic increase in this difference occurs, however, among managers, officials, and proprietors. In this category the quitting rate for men is 47.1 percent and that for women is only 26.5 percent. Among sales and clerical workers, 40.1 percent of the men and 25.8 percent of the women have quit. The quitting rate of homemakers (33.9 percent) is in the mid range of the rates for women in other occupations.

In general, then, women are quitting at lower rates than men across the major demographic categories.

PSYCHOLOGY OF CHANGING SMOKING HABITS

A two-year follow-up of over 500 former smokers identified in the 1964 nationwide survey provides support for the demographic data showing higher proportions of ex-smokers among males than females (56). Men were significantly more likely than women to remain successful abstainers. Men and women made approximately the same number of attempts to quit, and current smokers made more attempts than former smokers (168). Furthermore, successful quitters have usually made at least one abortive attempt to quit before succeeding. A survey of young women, aged 18 to 35, revealed that light smokers had the greatest success in stopping smoking (216). This finding is not entirely consistent with that of Eisinger (56), however, who reported that long-term smoking was a predictor of successful abstinence. The difference in study samples may account for the lack of "fit" of the two results, as Eisinger's survey included all adults 21 years of age and older. The "reinterview" (follow-up) aspect of Eisinger's study gives further credence to his conclusions since they are based on data actually obtained at two points in time.

Those factors which consistently seem to differentiate between those who can quit or reduce intake and those who cannot are: the presence of strong motivation and commitment to change; the use of behavioral techniques; and the availability of social support. Those who successfully quit or reduce smoking use behavioral techniques such as substituting candy and gum for cigarettes, and some form of self-reinforcement of desirable behaviors to maintain abstinence (140,216). Successful reducers use behavioral techniques more consistently and for a longer period of time than those who fail to reduce smoking (140). Successful quitters experience cravings when they stop, but the use of substitutes seems partially to alleviate these feelings (139). Furthermore, those smokers who do reduce intake are more

motivated and committed to personal change (140), and long-term abstainers have more confidence in their ability to remain ex-smokers (56). Successful reducers receive more positive reinforcement from others and the best known acquaintances of successful abstainers are former smokers (56,140). Warnecke, et al. reported female relatives to be the primary role models for women who quit smoking (201).

TREATMENT STUDIES

Most smokers who attempt to quit do not seek outside help to stop smoking. The population that seeks treatment may be one that experiences severe difficulty in giving up smoking. Thirty-nine treatment studies on smoking have reported success rates for males and females, and have used the criterion of total abstinence. Two exceptions were made for programs that reported "success" in terms of 90 to 100 percent reduction.

The studies reviewed here fall into five categories of treatment: education, physician advice, pharmacotherapy, psychotherapy, and behavior modification (Tables 9-13). The categorization is, by necessity, only a rough separation of treatment modalities. Evaluation of the gender difference question, however, does not rest directly on the categorization schema.

Many of the studies listed in the tables did not report significant evaluations for male/female quitting rates. Therefore, a chi square statistic or Fisher exact probability test was calculated wherever sufficient data were available. Because of the limited number of studies identified for analysis and the often limited sample size, results of borderline ($0.05 < p < 0.10$) and acceptable ($p < 0.05$) levels of significance are reported for the reader's information.

The end-of-treatment cessation rates are high for all types of treatment, but the maintenance of cessation tends to be much lower. In 1971, Hunt, et al. demonstrated that recidivism curves of heroin, alcohol, and smoking are almost identical, with long-term cessation falling off steeply from the end of treatment (94). Within three months approximately 35 percent of successful quitters are still not smoking, and by one year, the figure is closer to 20 percent. In 1978, another reviewer cited virtually the same figures (147). There have been reports of improvement in techniques for obtaining abstinence and in maintaining it, using rapid smoking (an aversive conditioning technique), hypnosis, and group therapy. The long-term cure rates of 60 percent or higher at six months claimed in some studies have not been reproducible in other settings. The smoking cessation literature has been recently reviewed in detail (80,147,168,198).

Across all treatments, women have more difficulty giving up smoking than men, both at the end of treatment and at long-term points of measurement. No studies have been reported in which women do significantly better than men. Several of the larger studies show higher abstinence rates by men, but many show no difference. Results in the tables are based primarily on those who complete treatment programs. Attrition rates are very difficult to evaluate because most studies do not discuss the issue of subjects who drop out of treatment.

Because of the emphasis placed on the role of physician advice in increasing smoking education and promoting cessation, an estimate of its effectiveness is relevant. From retrospective data, it is estimated that 35 percent of people who have been advised by a doctor either to quit or to cut down sharply, actually do quit (139). Twenty-five percent of those who have not talked to a physician about smoking quit, and only 12 percent who have been told by a physician that it was permissible to continue smoking quit.

The prospective treatment literature yields varying estimates of the impact of physician advice. Ten to 25 percent of patients advised by a physician to quit or cut down actually do so (198). Gender does not seem to exert a particular influence. The primary variables associated with the ability to quit after physician admonition were good psychosocial assets, psychological stability, and the ability to verbalize depression (54).

Success in treatment in general seems to relate to personal characteristics. A shorter smoking history and lower cigarette consumption also predict a greater likelihood of cessation (104,144,204). In addition, those subjects most likely to succeed in treatment are highly motivated, believe they will succeed, and are confident of their ability to stop smoking (82,136,187).

One group of women that seems to have great difficulty in giving up smoking in treatment is homemakers. Homemakers in the age range of 18 to 35 tend to be heavy smokers, and heavy smoking is one predictor of failure in treatment (216). Kanzler, et al. found that homemakers were less successful at quitting, particularly at long-term follow-up (104). However, as previously discussed, homemakers have quit rates in the mid-range of those of women in other occupations; therefore, the difference may apply only to those homemakers who seek help through treatment programs.

Wilhelmsen found significant male/female differences in treatment success rates and stated that the poorer performance of women related almost exclusively to the unsuccessful results of homemakers (209). These women explained that cigarettes served as companions and they reported the difficulties of being

TABLE 9.— Education-Smoking cessation treatment results by sex

Study	Treatment	N	Percent Abstinence		
			End-of-Treatment (%)	Six Months (%)	Long Term (%)
1. Guilford, 1967** (82)	Five-Day Plan* unaided	75M 100F		23M } 12F } 2	
	Aided	82M 91F		27M } 29F } 1	
2. Peterson et al., 1968** (141)	Five-Day Plan	134M&F	79M&F		19M (18 mo. follow-up 19F on 121 Ss)
3. Berglund, 1969** (4)	Five-Day Plan	895M&F	87M 84F	32M } 27F } 2	31M } 23F } 1 (4-18 mo.)
4. Delarue, 1973 (44)	Education, small groups	472M&F			34M (12 mo.) 21F
5. Danaher et al., 1978† (41)	Education; skill training group	11F	50 (of 8 Ss finishing treatment)		50 (9 mo.)
6. Ochsner & Damrau, 1970 (136)	Pamphlets*	20M 33F	85M } 52F } 1		
7. Pyszka et al., 1973** (146)	American Cancer Society Clinics	131M 223F	39M&F		28M (18 mo.) 20F

TABLE 9.—Education—Smoking cessation treatment results by sex—(Continued)

Study	Treatment	N	Percent Abstinence		
			End-of-Treatment (%)	Six Months (%)	Long Term
8. Kanzler et al., 1976 (104)	Smokenders	210M 343F	70M 69F	57M 30F	1 (48 mo.)
9. Dubren, 1977* (53)	T.V. spots	92M 218F	15M 7F		1

¹p < 0.05

²0.05 < p < 0.10

*Success = 90-100% reduction in smoking.

**Results based only on those completing treatment or contacted for follow-up.

†Pregnancy intervention study.

TABLE 10.—Physician advice—Smoking cessation treatment results by sex

Study	Treatment	N	Percent Abstinence		
			End-of-Treatment (%)	Six Months (%)	Long Term (%)
1. Burns, 1969 (27)	M.D. advice to resp. dis. pts.	66M 28F	53M } 32F } 1 (3 mo.)		
2. Handel, 1973 (87)	Anti-smoking message in med. exam	45M 55F	38M } 11F } 1 (12 mo.)		
3. Burnum, 1974 (28)	M.D. advice	84M 40F	29M 18F		
4. Baric et al., 1976 (112)	M.D. advice (spont. quitters) (intervention) (control)	134F 24 63 47	83 14 14		
5. Donovan, 1977†(49)	M.D. advice	552F	50% reduction		

¹p < 0.05

†Pregnancy intervention studies.

without adult company all day and of being deprived of outside activities as obstacles to giving up smoking. Cigarettes have also been described as a means of temporally partitioning the day, of achieving physical autonomy from children, and of providing role differentiation (74).

Frieze, et al. reported women face more life stress than men and have more symptoms of psychological distress (68). Waters reports that women show more overt signs of neuroticism than men (203). Furthermore, he finds an association in women between degree of neuroticism and amount smoked. Burns also found that female smokers had higher neuroticism scores than did female nonsmokers. No such differences were found in men (27).

Some studies have shown that women who smoke are both more subject to psychological stress and more outgoing than women who do not smoke. In a prospective study on women and smoking, Cherry and Kiernan measured personality traits in young women before the onset of smoking (31). They found that smokers had high neuroticism and extroversion scores before taking up the habit. They add that current women smokers are more extroverted and also more neurotic than nonsmokers. There is evidence that women smokers are more independent-minded, assertive, self-opinionated and forthright (151,216). The latter authors report that women smokers are also characterized by apprehension and tension, and that these characteristics are related to an inability to give up smoking.

The presence of psychological distress has also been shown to affect the success of women in treatment. Peterson, et al. found that, while 23 percent of the men who had participated in a smoking program cited nervousness as the principal reason for resuming smoking, 43 percent of the women cited this reason (141). Russell reports that the presence of depression was related to dropping out of treatment, and that depression was more frequent and severe among the women in his sample (156). In a later study, Russell found that within the treatment group, women had worse psychiatric adjustment scores than did men (159). Furthermore, although the degree of psychiatric adjustment did not differ between male treatment successes or failures, treatment successes among women were significantly more likely to have good adjustment scores. Rode found that success in a smoking withdrawal program was related to lack of tension and apprehension for women (150). That smoking might indeed act as a method of coping with psychological and social stress is illustrated by the fear reported by many women that they will engage in symptom substitution—specifically overeating—if they stop smoking (14,23,27). It is also possible that underlying stress in women impedes the strength of the

TABLE 11.—Pharmacotherapy—Smoking cessation treatment results by sex

Study	Treatment	N	Percent Abstinence		
			End-of-Treatment (%)	Six Months (%)	Long Term (%)
1. Turle, 1958* (191)	Hydroxyzine	23F	4F		
2. Whitehead and Davies, 1964 (208)	Methylphenidate Diazepam	10M 6F	20M 0F	0M 0F	(12 mo.)
3. Wilhelmsen, 1968 (209)	Methylscopolamine tranquilizer	291M 200F		56M 41F	1 (12 mo.)
4. Wetterqvist, 1971* (207) 1973* (206)	Methylscopolamine	192M 98F	50M 33F	19M 12F	1 (12 mo.) 9M 9F (60 mo.)
5. Arvidsson, 1971* (5)	Anticholinergics, Group aversion therapy	50M 50F	85M 85F	48M 22F	1 (12 mo.)
6. Merry and Preston, 1963* (127)	Lobeline	45M 31F	29M 32F		
7. Golledge, 1965* (72)	Lobeline & placebo	19M 8F	63M 73F		
8. Ross, 1967* (152)	Lobeline Amphetamine	728M 745F	40M 29F	21M 12F	1 (10-57 wks.)

TABLE 11—Pharmacotherapy—Smoking cessation treatment results by sex—Continued

Study	Treatment	N	Percent Abstinence		
			End-of-Treatment (%)	Six Months (%)	Long Term (%)
9. Schauble et al., 1967* (164)	Lobeline	33M	18M	} ¹	
	Amphetamine	35F	26F		
	Lobeline, amphetamine and education	14M	57M		
		17F	26F		
10. West et al., 1977* (204)	Lobeline, amphetamine	255M	43M	} ¹	22.0M } 1 (60 mo.)
		288F	33F		

¹p < 0.05

*Results based only on those completing treatment or contacted for follow-up.

TABLE 12.—Psychotherapy—Smoking cessation treatment results by sex

Study	Treatment	N	Percent Abstinence			
			End-of-Treatment (%)	Six Months (%)	Long Term (%)	
1. Moses, 1964 (129)	Hypnosis, discussion	35M 15F	83M 53F	2	11M 12F	8M 12F (12 mo.)
2. Mann and Janis, 1968 (119)	Emotional role-playing	26F				23-50F (18 mo.)*
3. Streltzer and Koch, 1968 (185)	Emotional role-playing	30F	0F (4 wks. post)			
4. Lichtenstein et al., 1969 (115)	Emotional role-playing	54F	9F (1-5 wks. post)			
5. Fee and Benson, 1971 (62)	Group therapy	306M 204F	56M 38F	1		16M 9F } 1 (6-12 mo.)
6. Bozzetti, 1972 (23)	Group therapy	7M 7F	57M 43F			85M 57F (12 mo.)
7. Tamerin, 1972 (187)	Group therapy	16F	69F			

¹p < 0.05²0.05 < p < 0.1

*% reduction in smoking.

determination required to cease such behaviors as smoking and overeating. Weight gain is a frequently reported consequence of giving up smoking (173).

THE SMOKING WITHDRAWAL SYNDROME

Few of the studies reviewed here mentioned gender as a connection with withdrawal symptoms, and none suggested that men and women differ in the severity of smoking withdrawal symptoms. However, Shiffman (173) analyzed Guilford's raw data (82), and stated that 15 of the 18 major symptoms reported by subjects demonstrate sex differences (80,173). Thirteen of those 15 symptoms were more frequently reported by women. Other studies show similar, although not statistically significant, trends. (141,190,215).

Factors contributing to relapse, such as craving and nervousness, were reported to be similar for men and women (141). Women who experienced the greatest craving during the initial five days of abstinence were most likely to relapse (82). Since women score higher than men on measures of anxiety as a general rule, it is possible that they would be more susceptible to relapse if smoking had been their customary means of reducing such dysphoria. Women may also pay more attention to somatic symptoms than men, as they make more frequent use of all health care services, and specifically (because of the relative symptomatology) for headache and weight gain (114).

It is likely that the abstinence syndrome is a major factor in recidivism during the first few weeks of cessation when relapse is most common, and that the number of cigarettes smoked per day is an important variable in determining the severity of the withdrawal. The issue of a gender difference in withdrawal severity is a major area where research is needed.

SMOKING AND WEIGHT CONTROL

Women who smoke are, on the average, thinner than women who do not smoke. The reported mean weight difference ranges from 1.2 to 4.5 pounds (7,17,93). Weight gain has been a frequently documented consequence of quitting smoking, both in males and females, (17,37,65,71,141,190,209,215).

Studies of males have reported weight gains among former smokers which range from 1 to 12 pounds greater than those who continue to smoke. In one such study, the authors observed that, while 60 percent of continuing smokers gained weight, among quitting smokers the observed proportion was 85 percent (37). These figures gave rise to an observed-to-expected ratio of 1.4, suggesting that those who quit are 40 percent more likely to

TABLE 13.—Behavior modification—Smoking cessation treatment results by sex

Study	Treatment	N	Percent Abstinence				
			End-of-Treatment (%)	Six Months (%)	Long Term		
1. Keutzer, 1968 (105)	Breath holding, coverant control, negative practice, attention placebo	73M 73F	18M 29F				
2. Suedfeld and Ikard, 1973 (186)	Sensory deprivation	3M 2F	100M 50F	67M 50F	(3 mo.)		
3. Delahunt and Curran, 1976 (43)	Negative practice or self-control	50F	61	22	} 1		
	Negative practice and self-control		89	56			
	Control		15	0			
	Nonspecific treatment		56	11			
4. Tongas et al., 1976* (189)	Covert sensit., smoke aversion, group therapy, combined treatment	38M 34F		71M 39F	} 2	62M 32F	} 2 (12 mo.)
						48M 18F	
5. Russell, 1970 (156)	Electric shock aversion	10M 4F	70M 50F	40M 50F	(12 mo.)		

TABLE 13.—Behavior modification—Smoking cessation treatment results by sex—(Continued)

Study	Treatment	N	Percent Abstinence		
			End-of-Treatment (%)	Six Months (%)	Long Term
6. Chapman et al., 1971 (30)	Electric shock, self-management; post-treatment therapist monitoring: 2 weeks:	4M	75M	25M	(12 mo.)
		8F	100F	37F	
	11 weeks:	4M	100M	50M	
	7F	86F	57F		
7. Berez, 1972 (13)	Electric shock aversion, imagined vs. real smoking	56M	**		
		32F			
8. Russell et al., 1976 (159)	Electric shock and controls	28M	64M†		
		28F	57F†		

¹p < 0.05

²0.05 < p < 0.10

*Results based only on those completing treatment.

**Percent reduction, little for F; more for M in imagined-smoking condition.

†Two weeks post-treatment.

gain weight than those who continue to smoke; but a significant proportion of observed weight gain among men who quit smoking would have occurred even if they had continued to smoke.

The single major report on lifetime smoking and weight patterns in women examined data provided by approximately 57,000 female members of a national weight-reduction program (17). Cross-sectional analysis indicated that current smokers weighed less than nonsmokers by 1.2 pounds and 4.0 pounds less than former smokers. Inhalers were significantly less obese by 5.7 pounds than current smokers who did not inhale. A 40-year longitudinal analysis of weight in relation to reported lifetime smoking history revealed that between ages 30 and 50 (the two decades after the majority of those who quit had discontinued smoking), the former smokers gained more weight than continuing smokers, both for inhalers and non-inhalers. The calculated weight gain after cessation varied substantially by amount smoked; heavy smokers who inhaled (> 41 cigarettes) gained 30 lbs., while light smokers who inhaled (1 to 10 cigarettes) gained only 4 pounds. The observed differences in weight persisted through age 60. Conclusions of this study may not, in fact, be directly applicable to the total female population. This study raises the issues of reporting and recall bias among this obese population (mean group weights ranging from approximately 171 to 180 pounds), as well as self-selection into continuing or former smokers.

The implications of such studies are important. The image of the slender, attractive female pervades our culture and is certainly present in tobacco advertising (84). Do women perceive weight gain as a significant and unavoidable sequel to discontinuing smoking? There is evidence suggesting that fear of weight gain may keep women from quitting smoking. Women are more concerned with weight than men are. In the 1975 NCSH survey, the percentages of female and male smokers who responded "strongly agree" or "mildly agree" to the statement, "Being afraid of gaining a lot of weight keeps people from quitting cigarettes" are shown in Table 14.

Attempts have been made to examine the cause of such reported weight gains. The mechanism of weight gain with cessation of smoking has not, however, been elucidated. Trahair and others have reported that appetite increased with smoking cessation, and the resulting increased caloric intake caused weight gain (190). Other studies have suggested that smoking may, in fact, directly affect metabolism. Glauser, et al. studied seven males before and one month after cessation. Body weight and surface area increased, while heart rate, serum calcium, sugar, and oxygen consumption decreased (71). Conversely, however,

TABLE 14.—Percent affirmative responses to statement: “Being afraid of gaining a lot of weight keeps people from quitting cigarettes”

Smoking Status	Women (%)	Men (%)
Never Smoked	59.0	51.5
Formerly Smoked	63.1	53.6
Currently Smoked	59.9	47.3

SOURCE: National Clearinghouse for Smoking and Health (194).

Sims observed no change in resting metabolic rate, thermic response to exercise or meals, and no change in serum T₃ or T₄ (175).

Further research is necessary to define the degree of weight gain after cessation of smoking, the mechanisms by which it occurs and the ability to modify it by educational or behavioral interventions during and after cessation attempts.

TREATMENT RECOMMENDATIONS

Perri, et al. recommend that smoking cessation programs with a behavioral emphasis be comprehensive, multifaceted, long-term, and that they include self-reinforcement and problem-solving procedures (140). Given the difficulty for some women in simultaneously dieting and attempting to quit smoking, smoking withdrawal programs should adopt a total approach to health, including advice on dieting, exercise and the immediate benefits of abstinence (150).

Marlatt and Gordon write that relapse potential is greater for individuals whose daily schedule fails to include some rewarding or pleasurable activity (120). It would appear useful to attend to this issue in smoking treatment programs.

A social support hypothesis is frequently cited in the treatment literature to explain gender differences in quitting. It is often suggested that women do better than men in programs that provide a maximum amount of social support, and tend to do worse in situations where program support is low or outside factors militate against quitting. For example, Resnikoff, et al. were able to differentiate between those women (but not men) who did poorly in group-plus-medication treatment and those who did well using the Social Introversion Scale of the Minnesota Multiphasic Personality Inventory (149). This scale measures the degree of discomfort in social situations and the presence of outgoing tendencies. Women scoring high on this scale (shyer, more socially introverted) were less likely to quit than low-

scoring women. This study provides just one example of the observation that social support seems to be of lesser consequence to men in quitting smoking, although spousal support is important (170).

As the overall categories in Tables 9-13 show, women do more poorly in treatments characterized by less individual attention such as education and pharmacotherapy, compared with the categories of psychotherapy and behavior modification, where contact is usually maximized in a small group or in an individual-to-therapist setting.

Dubren reports that twice as many women as men participate in a television stop smoking campaign, but that fewer women stopped smoking—presumably because of a lack of support (53). Guilford found that when men and women participated in group programs, success and failure rates were the same for both sexes (78). When they did not attend group programs, men maintained the same success rates, but women achieved markedly lower rates. There is also support for the notion that groups are particularly effective for women if they are sexually homogeneous (44,78). Tamerin writes that the group can provide support, empathy, and shared identification with others going through a similar process (187). The group also provides an avenue for affective expression, so that the relevance of cigarettes to psychosocial events and the personal meaning of giving them up can be discussed. Given the differential reaction of men and women to quitting smoking, as well as the traditionally greater willingness of women to discuss affective issues, it is not surprising that all-female smoking-cessation groups have been particularly attractive.

Marlatt and Gordon studied the circumstances under which a smoking relapse is most likely to occur (120). They claim that experiencing stress in the form of a negative emotional state, social pressure, or interpersonal conflict is likely to lead to smoking among those who are attempting to abstain. The occurrence of a full-blown relapse, however, can be attributed to the cognitive reaction to stress-induced smoking. Many individuals who are trying to abstain view a single slip as evidence that they have failed, rather than as a natural and predictable reaction to a stressful situation. Marlatt and Gordon advocate teaching those who are trying to quit the importance of not viewing relapse in an all-or-none manner. Rather, they suggest teaching smokers to “plan for a relapse,” to become psychologically prepared to accept a slip as a natural part of the difficult process of quitting.

Another factor that appears to influence the success of women in treatment programs is smoking by significant others in the environment. Kanzler, et al. found a significant trend for women

to give up smoking if no one in their daily environment was a regular smoker (104). This trend was only slight for men, although spousal encouragement was related to success in one large study of smoking cessation treatment in men (170). The influence of the smoking behavior of significant others on female attempts to quit has been repeatedly pointed out (14,201,204). Sensitizing friends and relatives who are smokers to this problem, and advising discretion in smoking behavior on their part, might increase treatment effectiveness for women.

CONCLUSIONS

Treatment programs should specifically deal with means of handling anxiety and tension, ways to combat weight gain, and should prepare smokers for mini-relapses. Social support should be maximized. It may be increased through choice of treatment modality, networks of "buddies," friends and relatives, and the involvement of spouses.

It should be possible to capitalize on the heavy commitment of women to the health care system, both in terms of their own use and their role as family providers. Health professionals need to devise targeted interventions for women with this in mind.

Dissemination of Information About Smoking

HEALTH ATTITUDES AND BEHAVIORS

The extraordinarily serious health consequences of smoking have not deterred almost 30 percent of the adult female and 37 percent of the adult male population from smoking regularly. Seventy to 80 percent of these smokers agree that cigarette smoking is harmful, is a health hazard that requires action, and causes disease and death (194). Former smokers and nonsmokers take a much stronger stand on these three points, ranging from 87 to 96 percent agreement. Gender differences are very slight.

The value placed on health compared to other positive life goals was slightly lower for smokers than nonsmokers, and highest for ex-smokers (194). Out of a maximum factor score of six, current smokers averaged 4.66 ($M = 4.55$, $F = 4.81$), and nonsmokers averaged 4.82 ($M = 4.68$, $F = 4.9$) and ex-smokers averaged 4.89 ($M = 4.78$, $F = 5.06$). The higher scores of women support their traditional concern with health in our culture but they are incongruent with recent smoking trends (114).

Fewer current smokers than nonsmokers and ex-smokers report having personally known someone with coronary heart disease, lung cancer or emphysema/chronic bronchitis. This finding may be attributable to a process of denial. Only about one-third

of current smokers admitted knowing someone personally whose "health" was adversely affected by smoking while over 60 percent of nonsmokers knew such a person. Clearly, mechanisms must be operating in smokers to reduce cognitive dissonance caused by their behavior and their knowledge of the health consequences of their behavior. One of these mechanisms may be to deny that the health problems of others are connected to smoking.

A related issue is that of compliance. The term encompasses a host of behaviors, all related to following medical recommendations: seeking care when serious symptoms appear, taking medications, having follow-up examinations and procedures, and doing breast self-examination, to name only a few. A large number of studies have been performed in this area, and there is no evidence that one sex shows greater propensity to be compliant than the other (90,114).

Thus, we would have no reason to expect that women and men would respond differentially to doctors' advice to change their smoking behaviors, at least from this literature.

Women in our society are more involved with health care services (114). They arrange for those services and act as role-models for children. This function would have great information delivery potential.

SOURCES OF INFORMATION

There are a variety of ways that people can learn about the health consequences of tobacco use. The information gathered from and effects of tobacco company advertising will be discussed separately below. The major sources of information fall into a number of categories.

Health Care Providers

The influence of physicians and nurses as communicators of information and as exemplars of healthy life styles has been the subject of much research (198). The greater concern about health among women, and their greater contact with health professionals, provides an obvious avenue of intervention (114). Health professionals should be continuously reminded of their potential impact and advised to use it to influence women to reduce smoking. Physicians are considered the most authoritative source, with the greatest potential for influencing patient behavior.

From the self-report of adults, physicians are not delivering enough anti-smoking information and advice. In 1975, a full 64.6 percent of male and 60.8 percent of female current smokers

claimed that they had never received advice from any doctor about quitting, cutting down, or continuing smoking (194). About 19 percent of male and 21 percent of current female smokers had been advised to quit. Combining advice to quit and/or cut down, the percentages rose to 34.8 percent of men and 37.7 percent of women. In 1970, the percentages of men and women who reported such advice were 30.2 percent and 34 percent, respectively (193). A somewhat lower estimate of physician advice was obtained from an ongoing nationwide study involving approximately 8,000 people (184). Advice to quit or cut down was reported by 22.4 percent of the subjects, and lack of advice by 77.6 percent; there were no significant gender differences.

A survey of physicians' opinions about smoking and health in the mid-1960s revealed that 38 percent claimed they advised "all" or "almost all" (95 to 100 percent) of their patients who did not have smoking-related disorders to quit or cut down (76). Eighty-eight percent of physicians claimed they gave such advice to patients with lung and pulmonary conditions.

Nurses spend more time in direct patient contact than do physicians and can exert a major role in delivering information as well as serving as exemplars. Most nurses are aware of this responsibility (60,75,135,195). Only 10 percent of nurses claimed to discuss smoking and health with "almost all" or "most" (65 to 99 percent) of their patients or students (135). Another 21.5 percent claimed to have discussed it with 35 to 64 percent of patients or students. Only 50 percent of current smokers, compared to 65 percent each of former smokers and nonsmokers, suggested stopping to 5 percent or more of their patients and students.

While the identical question was not asked of nurses in the 1975 survey, a number of valuable questions relating to exemplar status were posed (196). In almost every case, current smokers took the weakest position on exemplar role, former smokers were in between, and nonsmokers were strongest. For all questions, the proportion of nurses who agreed "strongly" or "somewhat" with the statements of exemplar role is reported here. Regarding their own behavior, 69.5, 91.7, and 94.5 percent of current, former and nonsmoking nurses respectively felt that they should set a good example by not smoking. This percentage varied according to work location. Lowest percentages were given for hospital duty (70.0, 83.3, and 89.2 percent for current, former and nonsmokers respectively), intermediate for private physician's office (79.9, 86.7, and 90.5 percent, respectively, and highest for private duty (91.1, 91.4, and 94.4 percent, respectively). A much lower rate of agreement about not smoking in public while in uniform was obtained; only 44.4 percent of current smokers, 67.1 percent of former smokers, and 72.8 percent of nonsmoking

nurses concurred. Nurses believe that it is their responsibility to convince people to stop smoking (64 percent of smokers, 74 percent of former smokers, and 64.8 percent of nonsmokers). Approximately 54 percent of smokers, 81.3 percent of former smokers, and 82 percent of nonsmokers said they had tried to persuade someone other than patients to quit, and a much higher percentage reported convincing someone not to start (83.4, 78.6, and 75.8 percent, respectively). Finally, 52.1, 78.2, and 85.4 percent of the respective groups agreed strongly or somewhat that nurses should be more active in speaking to lay groups.

Given the possible role modeling effect of female nurses, a need exists for adequate preparation of all health professionals in smoking and health counseling. This preparation should include education on the health hazards of smoking as well as effective methods of counseling patients.

There is little information available about the role played by other health care providers in dissemination of information or discouragement of smoking behavior. Nationwide campaigns are currently being aimed at physicians and dentists to increase their commitment to and involvement with this task. Other health care providers should be encouraged to take a more active role and adopt exemplar status as well.

Educators

Adult educators include those in schools and colleges, job training, community organizations (churches and other religious groups, Young Women's Christian Associations, and Red Cross, civic organizations, social service groups, cultural groups) and in school-based programs for parents. There are large number of sources of information about smoking available from educators in adult settings and in programs for parents. These have been studied in-depth and reviewed elsewhere (188, 198). The frequent contact with and involvement of women in the school system should provide excellent opportunities to provide female-oriented information.

Peer Group

This group is an important, influential source of information on behavior. Evidence is strongest for the effect on initiation (addressed earlier in this Part). In two studies of British working class women, the peer group was an important source of information about smoking and pregnancy (11,74). Other strong relationships within the lay adult community have also been reported (118,201).

Family

Significant others, especially within the family, have been shown to be primary sources of information to pregnant women (11,74). The female relative may serve as a particularly important role model for black women (201). Smoking initiation is strongly influenced by parental smoking habits in teenagers (addressed earlier in this Part). In married couples, smoking patterns tend to be congruent; this almost enforces a sharing of information and makes it especially important in quitting efforts that couples stop together or are very supportive of the new ex-smoker (77,118,170,216).

Media: Television, Radio, Film, Newspapers, Magazines

The use of the mass media as a source of information as well as a tool in effecting cessation has been extensively developed in recent years (55,188,193,198,202,214).

Since women are almost exclusively the target audience of women's service magazines, effort should be devoted to using this medium to provide information on smoking and health, cessation techniques, and clinic availability. These magazines have not adequately disseminated information on smoking and health.

One of the principal reasons suggested for this failure is the power that tobacco companies wield through the economic incentive of advertising (178). Only one women's service magazine does not accept cigarette advertising in the United States. Frank admission of the economic dependency upon such advertising has been made. Not a single leading national woman's magazine that accepts cigarette advertising in 7 years of publication printed an article "... that would have given readers any clear notion of the nature and extent of the medical and social havoc being wreaked by the cigarette-smoking habit" (178). Smith goes on to point out that those magazines that do not accept cigarette advertising, or have no advertising at all, have done considerably better at informing their readers of the health risks of smoking.

Advertising

In recent years, advertising in the United States has been directed specifically towards the women's market, with themes as diverse as the emancipation of women, the first woman (biblical reference), romantic love, and the independent single woman. Most girl smokers have a positive impression of the