

Association of Perceived Family Criticism with Health Behaviors

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BACKGROUND. Criticism from family members has been implicated in psychiatric illnesses such as schizophrenia, depression, and eating disorders. Perceived family criticism has also been linked to primary health care use. In our study, we examined the association between perceived family criticism and health behaviors, as well as the potential mediating role of negative affect.

METHODS. A questionnaire was mailed to patients receiving care at a family medicine center. Perceived family criticism was measured using the Family Emotional Involvement and Perceived Criticism Scale. Diet, regular exercise, smoking status, and levels of depression, hostility, and physical health were also assessed through self report.

RESULTS. Nine hundred twenty-two (62%) active family medicine patients responded to our questionnaire. Complete data were available for 875 patients. In univariate analysis, a high level of perceived family criticism was associated with various demographic characteristics, poorer physical health, negative affect, higher fat intake, lack of exercise, and smoking. In multivariate analysis, the association between a high level of perceived criticism and health behavior was independent of demographic characteristics and physical health, for example, high-fat diet (odds ratio [OR] = 1.47; 95% confidence interval [CI], 1.11 - 1.95), no regular exercise (OR = 1.37; 95% CI, 1.02 - 1.84) and current smoking (OR = 1.38; 95% CI, 1.00 - 1.90). None of these associations was statistically significant after controlling for depression and hostility.

CONCLUSIONS. A high level of perceived family criticism is associated with adverse health behaviors. This association appears to be explained by resultant depression and hostility.

KEY WORDS. Health behavior; family; depression; smoking. (*J Fam Pract* 1999; 48:128-134)

A growing body of research has shown that family and social relationships influence physical health as powerfully as traditional risk factors, such as smoking.^{1,2} However, family and social support interventions have had limited success in improving biomedical health outcomes.^{3,4} This limited success is in contrast to the success of family psychoeducational interventions in reducing relapse in schizophrenia.⁵

A key difference between family research on psychiatric outcomes and biomedical outcomes has been the focus in psychiatric family research on the concept of expressed emotion, particularly critical comments directed toward family members. A recently published meta-analysis of prospective controlled studies confirmed that critical comments predict relapse in schizophrenia, depression, and eating disorders with larger numbers affected in the latter 2 disorders.⁶ A causal role for family

criticism is supported by randomized controlled trials showing that interventions designed to reduce family criticism reduce hospitalizations in schizophrenia.^{5,7-12}

Only a handful of studies have assessed the association between family criticism and physical health. Several small observational studies suggest that family criticism is associated with poor glucose control by patients with type 1 diabetes,¹³ less success with weight loss,¹⁴ and problems with asthma.^{15,16}

On the basis of previous findings from a pilot study,⁴ we hypothesized that perceived family criticism would be associated with adverse health behavior, including smoking, higher dietary fat intake, and less exercise, independent of age, sex, race, income, education, and health status (Figure). We hypothesized that this association would be largely mediated by higher levels of negative affect, in particular depression and hostility.

METHODS

SAMPLE

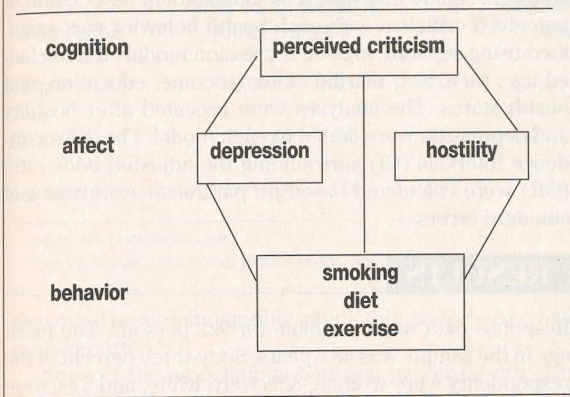
The population base was composed of patients receiving primary medical care at the hospital-affiliated Family Medicine Center in upstate New York. The sample was derived from a database being used to examine the impact of family function on cardiovascular health. Patients were eligible for inclusion in the sample if they

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FIGURE

A model of the relationship between perceived criticism, negative affect, and health behaviors.



had a cholesterol value in the database, had made at least 2 visits to the Family Medicine Center in the 18 months before March 1991, and were aged 33 years or older. These selection criteria were developed to identify patients who were receiving ongoing care at the Family Medicine Center, had complete baseline cardiovascular data, and were in an age group at risk for cardiovascular disease. In households where 2 or more eligible patients lived, 1 household member was randomly selected. Patients who lived in group homes or who could not read or write in English were excluded. To make the results as generalizable as possible, the sample did not exclude unmarried patients or those living alone. These criteria identified 1480 patients. Of this sample, 558 patients were excluded: 495 surveys were not returned, 5 patients died, 20 questionnaires were undeliverable, 17 respondents reported themselves too ill to complete the questionnaire, 16 returned a blank questionnaire, and 5 said they were no longer patients at the Family Medicine Center. The 875 complete and 47 incomplete returns produced a total of 922 responders (62%).

PROCEDURES

Our study design was based on the results of a previously reported pilot study.⁴ We used a modified version of Dillman's total design method¹⁷ to conduct the survey. The questionnaire and a cover letter were mailed to patients in March 1991. Two weeks later a post card reminder was sent to nonresponders. At 4 weeks, a follow-up letter and a replacement copy of the questionnaire were mailed to nonresponders.

MEASURES

Perceived criticism (PC). This subscale of the Family Emotional Involvement and Perceived Criticism Scale is based on self reports from respondents (Table 1).¹⁸ The subscale consists of 7 items measuring the intensity of perceived criticism (Cronbach's alpha = .82). Items are

scored on a Likert scale of 1 (almost never) to 5 (almost always); total subscale scores ranged from 7 to 35. Higher scores represented higher levels of perceived criticism. This subscale has been previously shown to be reliable (Cronbach's alpha = .82) and valid compared with other family function measures.^{18,19} High perceived criticism was defined as a score value greater than the median value of 11.

Hostility (Ho). This subscale consisted of 14 questions from the Cook-Medley Hostility Scale, which was derived from questions in the Minnesota Multiphasic Personality Inventory.²⁰ The Ho scale has been previously shown to predict mortality²¹⁻²³ and health risk behaviors.^{24,25} The 14 questions comprise 2 subscales of the Ho scale (hostile affect and aggressive responding) that have been shown to predict mortality more accurately than the entire scale.²⁵ Each question uses a 5-point Likert-type response (1 = definitely false; 5 = definitely true), providing a range of 14 to 70 (Cronbach's alpha = .74). High hostility was defined as a score exceeding the median value.

Depression. This subscale consisted of 12 items from the Symptom Checklist-90 (SCL-90). The full SCL-90 is a well-validated 90-item scale that measures 9 psychiatric symptom constructs.^{27,28} The depression subscale (Cronbach's alpha = .92) uses a Likert scale (1 = not at all; 5 = extremely) in response to questions about affect. Scores range from 13 to 65. High depression was defined as a score exceeding the median value.

Demographic variables. Older age was coded as 45 years and older; race was coded as white or minority (67% of those in the minority category were African American); education was coded as completing high school or higher; married was coded as being married or having a stable partner; and low family income was coded as annual family income less than \$25,000.

Health behaviors. Smoking status, dietary fat intake, and exercise habits were assessed through a series of questions regarding weekly health habits that showed face validity. Smoking was assessed by asking subjects whether they currently smoked cigarettes. Self-reported

TABLE 1

Perceived Criticism Subscale Items

- My family approves of most everything I do.
- My family finds fault with my friends.
- My family complains about the way I handle money.
- My family approves of my friends.
- My family complains about what I do for fun.
- My family is always trying to get me to change.
- I have to be careful what I do or my family will put me down.

Note: The subjects responded according to a Likert scale, where 1 = almost never and 5 = almost always.

TABLE 2

Characteristics of Persons with High Levels of Perceived Family Criticism and Persons with Low Levels of Perceived Family Criticism

Characteristic	High PC (%)	Low PC (%)	P*
Age >45 years	45	56	<.001
Male	38	35	>.05
White	79	87	<.001
Married	45	58	<.001
Education†	42	59	<.001
Low family income‡	64	44	<.001
High hostility score	70	40	<.001
High depression score	64	36	<.001
High-fat diet	52	39	<.001
No regular exercise	68	56	<.001
Current smoker	33	22	<.001
Physical health	40	63	<.001

PC denotes perceived criticism.

Note: Variables were dichotomized at the median value unless noted otherwise.

*Comparison based on chi square analysis.

†Education was defined as being a high school graduate and having pursued further education.

‡Low family income was defined as <\$25,000 per year.

smoking habits have been shown to be valid compared with proxy reports²⁹ or biochemical verification.³⁰ Dietary fat intake was assessed by asking how many times per week the respondents consumed red meat, fried foods, whole milk, eggs, butter, and cheese (cottage cheese excluded). A high-fat diet was defined as consuming these foods more than 3 times per week. Exercise was assessed by asking: "In your spare time, do you exercise or play sports on a regular basis?" Similar single-question assessments of exercise have been shown to have good validity compared with physiologic measures of fitness.³¹ Dichotomous variables were created for smoking, high fat intake, and no regular exercise.

Health status. Physical health was assessed with the physical function subscale of the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36).³² This 10-item subscale has good internal reliability (Cronbach's alpha = .94) and has been well validated.³³ Good health was defined as exceeding the median possible value.

STATISTICAL ANALYSIS

The data were analyzed using SAS software.³⁴ People with high and low levels of perceived criticism were compared using chi square analyses. The independent association of perceived criticism with each health behavior was examined using separate logistic regression models that included age, race, sex, marital status, income, education, and health status. The analyses were repeated after hostility and depression were added to each model. The 95% confidence intervals (CI) surrounding the adjusted odds ratio (OR) were calculated based on parameter estimates and standard errors.

RESULTS

Response data were available for 922 persons. The mean age in the sample was 48.5 years. Sixty-three percent of the respondents were women, 82% were white, and 51% were married. The mean annual family income was \$20,000 to \$24,999, and the mean education was 13 years. The 553 surviving people not responding to the questionnaire were similar to those 875 respondents (59% providing complete responses (mean age 48.5 years vs 48.4 years, 72% white vs 85%, and 19% Medicaid vs 13%). Data regarding other variables were not available for nonresponders.

Compared with those 47 respondents with missing responses, the 875 persons providing completed questionnaires were younger (mean 48.8 years vs 55.5), had more education (mean 13.0 years of school vs 12.1), were less likely to have Medicaid insurance (16% vs 26%), reported better physical function levels (mean 72.7 vs 63.2), and had higher levels of social support (belonging subscale mean 19.5 vs 18.4 and appraisal subscale mean 19.6 vs 18.6), and were more likely to be married (54% vs 32%). No statistically significant differences were found on any of the other measures.

Table 2 compares respondents with high levels of perceived criticism and those with low levels. People reporting high levels of perceived criticism were younger, more likely to be nonwhite and unmarried, have less education and income, show greater hostility and depression, report poorer health, be more likely to consume a high-fat diet, not exercise regularly, and smoke. Perceived criticism showed the highest correlations with hostility and depression ($r = .30$ and $r = .27$, respectively). Correlations with the demographic variables ranged from .22 for income to none for sex.

In a multivariate analysis that controlled for age, marital status, education, income, and health status, perceived criticism was independently associated with consumption of a high-fat diet and no regular exercise (Table 3). The association with smoking was marginally statistically significant ($P = .05$). Other statistically significant associations included nonwhite race and younger age with a high-fat diet; older age, less education, and poorer health with no regular exercise; and not being married, younger age, less education, and less income with smoking (results not

TABLE 3

Relationship of Perceived Criticism to Behavioral Risk Factor

Risk Factor	Odds Ratio Not Adjusted for Negative Affect (95% CI)	P	Odds Ratio Adjusted for Negative Affect (95% CI)	P
High-fat diet	1.47 (1.11 - 1.95)	.007	1.23 (.91 - 1.66)	>.1
No exercise	1.37 (1.02 - 1.84)	.04	1.21 (.89 - 1.66)	>.1
Current smoking	1.38 (1.00 - 1.90)	.05	1.24 (.89 - 1.75)	>.1

CI denotes confidence interval.

Note: All analyses control for marital status, age, education, and income.

shown). These demographic predictors have been previously reported.³⁵⁻³⁷

None of the associations between perceived criticism and behavioral risk factors remained statistically significant after controlling for hostility and depression (Table 3). In these analyses, hostility was associated with diet (OR = 2.04; 95% CI, 1.52 - 2.72) and smoking (OR = 1.37; 95% CI, 1.02 - 2.82), while depression was associated with no exercise (OR = 1.52; 95% CI, 1.12 - 2.08). There were no significant interaction effects between high perceived levels of criticism and either hostility or depression for any of the health behaviors. When the analysis was repeated using all of the original ordinal variables instead of dichotomous variables, the associations with high-fat diet ($P = .0002$) and smoking were significant ($P = .0005$), but were not significant for exercise ($P = .08$). In these analyses, adjustment for hostility and depression attenuated, but did not entirely eliminate, the association between perceived criticism and smoking ($P = .002$) and the association with diet remained marginally significant ($P = .05$). This suggests that the original analyses provide a conservative estimate of the observed associations between perceived criticism and behavioral risk factors.

DISCUSSION

Previous work showed that perceived criticism predicts primary health care use at follow-up, and that these effects are partly, but not fully, mediated through poor physical and mental health.³⁸ Our study extends these findings by confirming an association between family criticism and health habits that appears to be explained by depression and hostility. After controlling for potential confounding by age, sex, race, marital status, income, education, and physical health, perceived criticism showed statistically significant associations with both fat consumption and lack of exercise. Perceived criticism was marginally associated with smoking. None of the associations remained statistically significant after controlling for negative affect. These findings are consistent with our model that links family criticism to adverse health behavior indirectly through negative affect, and with previous studies linking

negative affect, family conflict, and low levels of social support to adverse consequences.³⁹

Although causal inferences cannot be made from these cross-sectional data, we can speculate about potential explanations for these findings. First, perceived criticism may cause unhealthy behavior through negative affect (Figure). Second, both perceived criticism and unhealthy behavior may be caused by a third factor. Finally, unhealthy behavior may cause family criticism.

Previous research suggests that negative affect may influence smoking, exercise, and fat consumption. Perception of family criticism may engender negative affect that is either internalized in the form of depression or externalized as hostility (Figure). Unhealthy behavior may represent an attempt to cope with these feelings.

Smoking, in particular, has been viewed as a pharmacologic regulator of negative affect.⁴⁰ Use of nicotine has been associated with a decrease in monoamine oxidase B activity and an increase in dopamine levels in the brain, both of which have been linked to affect regulation.^{41,42} Continued smoking has been linked to depression, hostility, and low partner support.^{40,43} Spousal criticism has been linked to negative affect and autonomic arousal.^{44,45} The physiologic stress accompanying marital conflict predicts decline in health at 3-year follow-up.⁴⁶ Marital distress has also been linked to lowered immune system functioning.⁴⁷ These health effects may be partly mediated by unhealthy behavior such as smoking. Thus, the association between perceived criticism, negative affect, and smoking may represent either higher rates of smoking initiation or lower rates of smoking cessation. An association between spousal criticism and lower rates of successful quitting has been reported.^{48,49} Prospective studies are needed to determine whether family criticism predicts smoking initiation.

A similar mechanism may underlie the association between perceived criticism and dietary fat intake. Diet has been associated with both depression and hostility.⁵⁰ In some cardiovascular prevention trials, cholesterol reduction has been associated with higher rates of suicide and accidents.^{51,52} Mice and monkeys that are placed on very low-fat diets exhibited higher levels of aggression.⁵³ Some studies have suggested a link between serum cholesterol levels and aggressive behaviors in humans.^{54,55} Because cholesterol is the precursor for serotonin and other neurotransmitters, it has been suggested that lowering cholesterol may result in decreased serotonin levels and increased levels of hostility or depression. Thus, there is some biologic plausibility for the hypothesis that a high-fat diet represents an attempt to reduce negative affect generated by perceived criticism.

The nature of the relationship between family criticism

and exercise is also speculative. Physical inactivity has been associated with depression, and exercise has been shown to help in the treatment of depression.⁵⁶ Because family criticism plays a critical role in depression,⁵⁷⁻⁵⁹ it is possible that such criticism results in less frequent exercise through higher rates of depression. Alternatively, people who exercise may experience less depression and perceive less criticism.

Confounding by a third factor is also possible. Although the analysis controlled for multiple potential confounders including age, race, sex, income, education, marital status, and physical health status, it is possible that unmeasured or inadequately measured variables confound the relationship between perceived criticism and health behavior. One example is sensitivity to perceived criticism. This might create an inaccurate *perception* of family criticism, and at the same time cause depression and hostility, that in turn causes unhealthy behavior.⁶⁰ In fact, perceptions of one's family may be partly genetically determined.⁶¹

Alternatively, depression and hostility may confound the relationship between perceived criticism and health behavior. In this case, depression causes perceived criticism either behaviorally or cognitively. For example, depression and hostility may elicit critical behavior by family members. Depression may also influence cognitive perceptions.⁶² If depression also causes unhealthy behavior, then the association between perceived criticism and unhealthy behavior may be spurious.

Finally, unhealthy behavior may engender criticism from more health-conscious family members. Although 4 of the items in the perceived criticism scale are topic specific (regarding money, friends, and fun), 3 items are global. Thus, this explanation cannot be dismissed. The study findings are consistent with each of these explanations. However, none is mutually exclusive. The pathways between family process, family perceptions, affect, and health behavior are likely to be bidirectional and complex. Carefully designed prospective and interventional studies are required to tease out the nature of these intriguing associations.

Our findings add to the growing literature on negative family interactions and health. Coyne and Bolger⁶³ and Rook⁶⁴ have argued that negative or hostile interactions are more potent than positive interactions, and that the effects of social support on health result from the absence of negative interactions. Unlike other family variables, family criticism and conflict have been consistently linked to poor health outcomes.¹³⁻¹⁶ In contrast, research on family cohesion, adaptability, and other family variables has been more conflicting.^{39,65} In addition, these constructs are more abstract and less likely to be spontaneously reported by patients.

LIMITATIONS

Our findings must be tempered by the limitations of the study. Clearly, the study sample is not representative of the general population. Subjects were selected from an exist-

ing database designed to assess the impact of family and social relationships on cardiovascular health. Responding subjects tended to have more education and were more likely to be married than were nonresponding subjects. Thus, the findings from this selected population may not necessarily apply to other primary care patients.

Additionally, the study findings were made entirely on the basis of self-report measures. Unlike the expressed emotion literature, where critical comments have been traditionally assessed through a structured interview with a family member, this study assessed the respondent's perception of family criticism. Thus, it is not clear whether perceived family criticism is primarily a measure of sensitivity to criticism or a measure of family process. It is conceivable, though not probable, that these findings represent a generalized tendency to respond negatively to survey questions.

Finally, the measures of health behavior were based on relatively few questions and were not objectively validated. However, self-reported smoking and exercise habits have been previously shown to be valid.^{30,31} Self-reported diet may be less valid.⁶⁶ Any error introduced by these measures would be expected to be largely random, however, and would tend to reduce any association between perceived criticism and health behavior.

CONCLUSIONS

Patients who perceive family criticism also report engaging in more unhealthy behaviors. This association appears to reflect negative affect. Consequently, physicians should be alert for patient reports of family criticism and conflict. When these factors are present, further exploration of depressive symptoms and the patient's health behaviors may be indicated. In addition, clinicians should assess the health behaviors, as well as the environment, of depressed patients. Finally, patients who engage in unhealthy behavior should be screened for depression and family conflict.

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