HEALTH CARE PROVIDERS' TRAINING, PERCEPTIONS, AND PRACTICES REGARDING STRESS AND HEALTH OUTCOMES

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In order to assess health care providers' training, perceptions, and practices regarding stress and health outcomes, a survey was administered to primary care providers in the outpatient medical clinics of a southeastern urban hospital serving a predominantly African-American indigent population. One-hundred-fifty-one of 210 providers (72%) responded. Forty-two percent of respondents reported receiving no instruction regarding stress and health outcomes during their medical/professional education. While 90% believed stress management was "very" or "somewhat" effective in improving health outcomes, 45% "rarely" or "never" discussed stress management with their patients. Respondents were twice as likely to believe that counseling patients about smoking, nutrition, or exercise was more important than counseling them about stress. Seventy-six percent lacked confidence in their ability to counsel patients about stress. The majority of respondents (57%) "rarely" or "never" practiced stress reduction techniques themselves. Belief in the importance of stress counseling, its effectiveness in improving health, and confidence in one's ability to teach relaxation techniques were all related to the probability that providers would counsel patients regarding stress. There is a need for curriculum reform that emphasizes new knowledge about stress and disease, new skills in stress reduction, and more positive beliefs about mind/body medicine and its integration into the existing health care structure. (*J Natl Med Assoc.* 2003;95:833–845.)

Key words: stress ♦ health care providers ♦ health outcomes ♦ training ♦ practice

INTRODUCTION

Stress has been defined as, "the process in which environmental demands tax or exceed the adaptive capacity of an organism, resulting in psychological and biological changes that may place persons at risk for disease"[1]. Stress has been associated with greater severity and duration of infectious diseases,[2] as well as immune-mediated diseases—such as asthma[3], rheumatoid arthritis[4], inflammatory bowel disease[5], and progression from HIV to AIDS[6]. There is now significant research showing that psychological stress can down-regulate various aspects of the cellular immune response and disrupt the bidirectional communication links between the central nervous system and the immune system[7-8].

Stress has also been linked to hypertension[9]. An extensive body of evidence from animal models, which has been summarized in a review by Rozanski et al. (1999), reveals that chronic psychosocial stress can lead to exacerbation and acceleration of coronary artery atherosclerosis, as well

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as to hypercortisolemia[10]. The authors also report that acute stress has been shown to trigger myocardial ischemia, promote arrhythmogenesis, stimulate platelet function, increase blood viscosity, and cause coronary vasoconstriction in the presence of underlying atherosclerosis. The review concludes by suggesting that present studies "provide clear and convincing evidence that psychosocial factors contribute significantly to the pathogenesis and expression of coronary artery disease"[10]. Recent research has also clarified the relationship between stress, inflammation, and cardiovascular disease[11]. Further evidence suggests that the cardiovascular, immune, and endocrine systems react simultaneously to a psychological stressor, creating a coordinated and consistent response[12]. In addition, stress has also been implicated in the development and control of diabetes[13-14], the perception and tolerance of acute and chronic pain conditions,[15-17] and the expression of somatization complaints[18].

Given its relationship with such a wide variety of disease states, it is not surprising to learn that stress has been considered an underlying factor for a wide variety, and perhaps even the majority, of health care provider visits. In 1981, a landmark study reviewing the charts of Kaiser-Permanente patients concluded that 60–90% of physician visits reflect emotional distress and somatization[19]. A similar study published in 1989 reviewed diagnoses and treatments for the 14 most common complaints of 1,000 patients followed in an internal medicine clinic over a three-year period. Although diagnostic testing was performed in two-thirds of the cases, an organic etiology was demonstrated in only 16% of the complaints. The authors report that many of the symptoms of unknown etiology were probably related to "psychosocial factors"[20].

McEwen's (1998) contribution to the stress literature through the development of allostatic load theory helps to explain the development of these disease processes through a breakdown in the allostatic process, which brings an acute stress reaction back to homeostatic balance[21]. This theory suggests that when individuals are exposed to acute and/or chronic stressors over an extended period of time, the stress response becomes sustained (as in hypertension and diabetes), with some body systems experiencing tissue fatigue and suppression (such as immune and pain systems).

While the body of evidence linking stress to disease continues to mount, a concurrent body of research has established the relationship between stress management or relaxation and the improvement of these disease states. Cardiologist Herbert Benson (1975) pioneered the term "relaxation response" to describe the physiological effects of relaxation which reverse the trends of stress and disease[22-23]. Building on his ground-breaking work, researchers have established a wide variety of benefits of stress management, relaxation, and coping interventions in treating asthma[24], arthritis[24-26], hypertension[27-33], diabetes[34-37], pain[16, 38-39], and somatization[40], as well as general health and well-being[41].

Despite proven scientific research on the physiological risks of stress and the benefits of stress management, little is known about health care providers' training, perceptions, and practices regarding stress and health outcomes. Previous research on physician counseling behavior, utilizing the theoretical framework of Bandura's Social Cognitive Theory (SCT)[42], indicates that physicians who expect that they will be successful in changing

Table 1. Health Care Provider Demographics (*n*=151)

Age	
Average age	30
Age range	24–58
Gender	
Male	64%
Female	36%
Race or ethnic group	
Caucasian	65%
Asian/Pacific Islander	15%
African-American	10%
Other	8%
Hispanic	3%
Year of medical/professional school graduation	
1995–1999	80%
1990–1994	11%
1967–1989	10%
Current or future specialty	
Primary care	44%
Subspecialty	40%
Undecided	16%
Country of citizenship (17 countries represented)	
U.S.	84%
Other	16%
Current position	
Resident physician	78%
Attending physician	18%
Nurse practitioner	3%
Physician's assistant	1%

Table 2. Prior Training in Stress and Health Outcomes

Received instruction (during medical/ professional school or residency)* (n=140)		
Stress management	62	(44%)
Mind/body medicine	37	(26%)
Other training on stress & health	27	(19%)
Psychoneuroimmunology	14	(10%)
None of the above	59	(42%)
How much instruction: (n=76)**		
One lecture	20	(26%)
2–3 lectures	44	(57%)
4–5 lectures	11	(14%)
Entire course	1	(1%)
Content of instruction (check all that apply)* (n=83)		
Heart disease and stress	53	(64%)
Health outcomes and stress	49	(59%)
Blood pressure and stress	45	(54%)
Pain tolerance and stress	32	(39%)
Immune functioning and stress	30	(36%)
Other	5	(6%)
Instruction on relaxation techniques (n=150)		
Yes	51	(34%)
No	99	(66%)
Type of relaxation techniques (n=50)		
Progressive muscle relaxation	38	(76%)
Meditation	30	(60%)
Diaphragmatic breathing	28	(56%)
Imagery/visualization	26	(52%)
Mindfulness***	7	(14%)
Other	1	(2%)

* Not mutually exclusive terms, may equal more than 100%.
** 5 missing
*** Focusing awareness on the present moment

a patient's behavior (outcome expectation) are more likely to ask their patients about the behavior and counsel them about it[43]. Physician self-perceived effectiveness (self-efficacy) in changing patient behavior is also associated with greater efforts to counsel patients on adult preventive care[44]. Finally, continuing medical education sessions that are interactive and allow participants the opportunity to practice their skills (role modeling, self practice) are the most effective in developing appropriate counseling skills[45]. The study below reflects our attempts to investigate health care providers' training, perceptions, and practices regarding stress and health outcomes in a primary care setting, utilizing a Social Cognitive Theory approach.

METHODS

Participants

Participants were internal medicine residents, attending physicians, nurse practitioners, and physician's assistants working in the outpatient medical clinics of an academic training program serving a predominantly African-American indigent population in an urban hospital in the southeast.

Study Design

Between August and November 1999, the survey was administered to 210 providers prior to their weekly ambulatory care clinics. Providers who did not initially respond to the survey were solicited for participation two more times, for an overall response rate of 72% (n=151).

The survey measured the stress counseling practices of providers and their level of training in stress management, mind/body medicine, and/or psychoneuroimmunology (these terms were not mutually exclusive and respondents could check more than one). Building on Bandura's Social Cognitive Theory (SCT)[42], we also investigated whether the tendency for providers to offer stress counseling to patients was associated with a) perceived effectiveness of stress management and stress counseling (outcome expectations), b) perceived importance of stress counseling (outcome evaluation), or c) perceived success in changing behavior (self-efficacy). In addition, health care providers' personal practice of stress management techniques was evaluated to determine if their personal practice might affect their perceptions of the importance and effectiveness of such techniques and the frequency that they would provide stress counseling to patients (See Appendix A for specific survey questions).

Statistical Analysis

The data were entered into EPI Info 6.04b and analyzed using SAS and SPSS 11.0. Simple frequencies and means were calculated for all categorical and ordinal variables. Spearman correlations were calculated for all of the ranked variables[46]. Multiple linear regression was used to determine relationships between the dependent variable—the frequency with which providers counsel patients about stress—and the independent variables mentioned above, which might influence the probability that such counseling would be provided[47]. For each analysis, a p value of <0.05 was considered to be significant.

Table 3. Importance of Counseling Patients on Health Behaviors

In general, how important do you think it is for providers to counsel patients about . . .? (n=150)

	Very Important	Somewhat Important	Not Very Important	Not at All Important	Don't Know Not Sure
Smoking	96%[a]	4%	0%	0%	0%
Nutrition	93%[b]	7%	1%	0%	0%
Exercise	90%[c]	9%	1%	0%	0%
Stress	47%	51%	1%	0%	0%

[a] statistically significant difference from same category for stress (χ^2=62.23, p<0.001)
[b] statistically significant difference from same category for stress (χ^2=66.06, p<0.001)
[c] statistically significant difference from same category for stress (χ^2=66.06, p<0.001)

The survey items relating to variables in the regression models were arranged in a four-point Likert scale, with two exceptions. Respondents who reported "none of the above" for training in stress management, mind/body medicine, etc. were assigned a "5" on a Likert scale, with the remaining four variables representing the amount of instruction (4=one lecture, 1=entire course). The survey item measuring the degree to which respondents felt stress management was effective in improving health outcomes was collapsed into a dichotomous variable because there were no respondents who felt that stress management was "not very" or "not at all" effective.

RESULTS

Subjects and Response Rate

One-hundred-fifty-one participants completed the survey, resulting in a 72% response rate. Specific respondent demographics are reported in Table 1.

Training of Providers

A large proportion of the respondents (42%) received *no* instruction in stress management, mind/body medicine, or psychoneuroimmunology (n=140) during their professional education, and 66% received no training in specific relaxation techniques (n=150). Of those who *did* receive instruction (n=78), 83% had received only 1–3 lectures. Less than 40% of those who received training (approximately 20% of all respondents) received specific instruction on the relationship between stress and immune functioning or stress and pain. Table 2 summarizes the health care providers' training regarding stress and relaxation.

Outcome Expectations

Perceived Effectiveness of Stress Management. When asked, "How effective is stress management in improving health outcomes?," 24% responded "very effective" and 66% said "somewhat effective." No respondents felt that stress was "not very" or "not at all effective," but 10% indicated that they were "not sure" (n=150).

Perceived Effectiveness of Stress Counseling. Twenty-nine percent of providers reported that they were not confident that their patients would actually follow their stress management recommendations, if offered them (n=143).

Outcome Evaluation: Perceived Importance of Counseling

Although 90–96% of respondents thought it was very important to counsel patients about diet, exercise, and smoking, only 47% thought it was very important to counsel them about stress (n=150). Chi-square analyses showed that these differences were statistically significant. Table 3 reports the opinions of respondents regarding the importance of counseling patients on different health behaviors and the results of the chi-square analyses (See Table 3).

Self-Efficacy: Perceived Success in Changing Behavior

When asked, "How confident are you in your ability to teach relaxation techniques (such as meditation, deep breathing, etc.) to your patients?," 76% responded that they were "not very" or "not at all confident." Fifteen percent reported that they were "somewhat" confident, while only 3% reported that they were "very" confident (n=151).

Table 4. Correlations of Social Cognitive Theory Variables with Stress Counseling

	Training	Important to counsel about stress	Personal practice of relaxation	Confidence teaching relaxation	Stress mgmt. improves health	Discuss stress management with patients
Training	1.00	0.290**	0.234**	0.297**	0.171*	0.154
Importance		1.00	0.438**	0.262**	0.430**	0.405**
Personal practice			1.00	0.397**	0.369**	0.393**
Confidence teaching				1.00	0.310**	0.345**
Stress mgmt. improves health					1.00	0.394**
Discuss stress mgmt.						1.00

** Significant at the 0.01 level

* Significant at the 0.05 level

Stress Practices

Stress Counseling. When asked, "How often do you discuss stress management with your patients?," 45% of respondents replied "rarely" or "never." Fifty percent reported that they discuss stress management "sometimes" and 6% discuss it "routinely" (n=151).

Personal Practice. The majority of respondents (57%) reported that they "rarely" or "never" practice stress reduction techniques themselves (n=149). Of those who do (43%), exercise was the most common technique used (70%), with a lesser amount reporting meditation (32%), imagery (26%), diaphragmatic breathing (21%), mindfulness (16%), and progressive muscle relaxation (16%).

Barriers to Counseling Patients About Stress

Providers reported many barriers in counseling patients about stress (n=149). Nearly three-quarters (73%) of respondents felt that they were too busy or didn't have enough time to counsel patients about stress management. Sixty-three percent reported their lack of training in stress management was a barrier, 54% felt a lack of confidence in teaching relaxation techniques, and 49% said a lack of referral sources was a barrier. Very few (7%) reported lack of interest in stress management as a barrier and none reported doubt that stress affects health.

Post-hoc Analyses for Potential Group Differences

Several *post-hoc* analyses were performed to determine if there were any differences between groups. Frequencies for training, personal practice, outcome evaluation, outcome expectation, and self-efficacy were calculated for each subgroup. Any difference in frequencies was then examined using Pearson chi-square analysis[46].

Physicians vs. Nurse Practitioners and Physician's Assistants. Although there were not enough physician's assistants and nurse practitioners (n=7) to compare to physicians (n=144), analyses were repeated with nurse practitioners and physician's assistants removed. This did not result in statistically significant changes for any of the findings. Given the fact that the results of this study reflect the training, perceptions, and practices of a group of health care providers working together in one health care setting, we believe it is important to represent this reality fully by including all providers in our representation of the data.

Primary Care vs. Subspecialty. Analyses were performed to determine if there were any differences between health care providers who declared an interest in primary care (n=65) versus those who declared intentions to specialize (n=85). There were no statistically significant differences detected between these two groups.

Caucasian Providers vs. Providers of Color. Analyses were performed to determine if there were any differences between caucasian health care providers (n=97) versus providers of color (n=53). To prepare for this analysis, providers who selected African-American, Hispanic, Asian/Pacific Islander, Native American, or Other for race were collapsed into a "Providers of Color" category, creating a dichotomous variable with caucasians. The only

Table 5. Summary of Multiple Linear Regression Analysis for Variables Predicting Frequency of Discussing Stress Management with Patients

Variable	β	F value	*t*-test	*p* value	R^2adj
	*	11.058	*	<0.001	0.238
Importance of counseling about stress	0.248	*	2.106	0.037	
Personal practice of relaxation techniques	0.118	*	1.763	0.080	
Confidence in teaching stress mgmt	0.144	*	1.935	0.055	
Stress management is effective in improving health outcomes	0.209	*	2.400	0.018	
Training in stress and health outcomes[+]					
n=151, df=4					

[+] Using backward variable elimination, training was eliminated as a variable for this model.

finding which was statistically significant between the two groups was the degree to which each group ranked the importance of counseling patients about stress (χ^2=8.11, p=0.004), with providers of color more likely than caucasian providers to view stress as a very important patient counseling topic.

Correlations Among Variables

Single Variables Predicting Stress Counseling. The frequency with which providers discussed stress management with their patients was *not* significantly correlated with the amount of training a provider received regarding the effects of stress on health (Spearman=0.154; p=0.08). However, training was significantly correlated with the outcome evaluation that it is very important to counsel patients about stress (Spearman=0.290; p=0.001) and confidence in teaching relaxation (Spearman=0.297; p < .001).

The frequency with which providers discussed stress management with their patients was significantly correlated with the provider's personal use of relaxation techniques (Spearman=0.393; p= <0.001). The provider's personal practice of relaxation techniques also was significantly correlated with self-efficacy or confidence in teaching relaxation techniques (Spearman=0.397; p=<0.001), and with the outcome expectation that stress management is likely to be effective in improving health outcomes (Spearman=0.369; p=<0.001) (See Table 4 for correlation matrix).

Combined Variables Predicting Stress Counseling. We used multiple linear regression with backward variable elimination to investigate the degree to which certain independent variables were associated with the dependent variable of frequency with which health care providers discuss stress management with their patients. Informed by the Social Cognitive Theory, we assessed the degree to which a select group of independent variables measuring training, personal practice, outcome evaluation (perception that stress counseling is important), outcome expectation (perception that stress management is effective in improving health outcomes), and self-efficacy (confidence in teaching relaxation techniques to patients), were associated with the frequency with which providers would offer stress counseling to their patients. The resulting model eliminated training as a variable. The relationship between the remaining variables was found to be significant (p<0.001). The resulting R^2adj indicates that 24% of the variability in the frequency with which providers counsel their patients about stress was explained by the combination of personal practice, outcome evaluation, outcome expectation, and self-efficacy.

DISCUSSION

With a sample of health care providers in an academic training program at an urban hospital for the indigent, we have begun to document the training, perceptions, and practices of health care providers regarding stress and health outcomes. Our results indicated that many providers received no instruction in topics related to stress and health, and the majority did not receive instruction in relaxation techniques during their medical/professional training. Among those who did receive instruction, only limited training was provided (1–3 days) for most, and less attention was directed to the relationship of stress to pain tolerance and to immune functioning than to heart disease, blood pressure, or other health outcomes.

Although 90% of providers judged stress management to be "very" or "somewhat" effective in improving a patient's health, this belief often did not

Appendix A—Relevant Sections of the Health Care Provider Survey

Demographics

1. *Country of citizenship* _____
2. *Race or ethnic group (if biracial, check all that apply)*
   ❑ Caucasian ❑ African-American ❑ Hispanic ❑ Asian/Pacific Islander ❑ Native American
   Other _____
3. *Sex* ❑ Female ❑ Male
4. *Age* _____
5. *Which of the following best describes your current position?*
   ❑ PGY-1 ❑ PGY-2 ❑ PGY-3 ❑ PGY-4 ❑ PGY-5 ❑ Attending Physician ❑ Nurse Practitioner
   ❑ Physician's Assistant ❑ Other _____
6. *What is your current or future career specialty?*
   ❑ Primary care ❑ Subspecialty _____ ❑ Undecided
7. *Year of graduation from medical/professional school:* _____

Professional Training

8. *Please check the areas in which you received any instruction during medical school, residency, or professional school:*
   ❑ Stress Management
   ❑ Mind/Body Medicine—that thoughts and behaviors influence health and well-being
   ❑ Psychoneuroimmunology (PNI)—the links between the mind, the brain, and the immune system
   ❑ Other training on the relationship between stress and health
   ❑ None of the above—*Skip to number 10.*
   If you received training in stress management, mind/body medicine, or psychoneuroimmunology, please check how much training you received:
   ❑ 1 lecture ❑ 2-3 lectures ❑ 4-5 lectures ❑ Entire course ❑ Other _____
9. *Please check which specific topics you received instruction in:*
   ❑ Immune functioning and stress
   ❑ Pain tolerance and stress
   ❑ Health outcomes and stress
   ❑ Heart disease and stress
   ❑ Blood pressure and stress
   ❑ Other: _____
   ❑ None of the above
10. *Did you receive any instruction/training on relaxation techniques in medical school, residency, or professional school?* ❑ Yes ❑ No
    If yes, please check which techniques: (check all that apply)
    ❑ Diaphragmatic breathing
    ❑ Meditation
    ❑ Mindfulness—focusing your awareness on the present moment
    ❑ Progressive muscle relaxation
    ❑ Imagery/visualization
    ❑ Other: _____

Clinical Practice

11. *In general, how important do you think it is for providers to counsel patients about ...?*

	Very Important	Somewhat Important	Not Very Important	Not at All Important	Don't Know	Not Sure
Diet / Nutrition	_____	_____	_____	_____	_____	_____
Exercise	_____	_____	_____	_____	_____	_____
Smoking	_____	_____	_____	_____	_____	_____
Stress	_____	_____	_____	_____	_____	_____

12. *How effective do you believe stress management is in improving health outcomes?*
    ❑ Very effective ❑ Somewhat effective ❑ Not effective ❑ Don't Know/Not Sure
13. *How often do you discuss stress management with your patients?*
    ❑ Routinely ❑ Sometimes ❑ Rarely ❑ Never
14. *How confident are you in your ability to teach relaxation techniques (such as meditation, deep breathing, etc.) to your patients?* ❑ Very Confident ❑ Somewhat Confident ❑ Not Very Confident ❑ Not At All Confident ❑ Not Sure
15. *Which of the following are barriers to you in counseling patients about stress management? (Check all that apply.)* ❑ I'm too busy/not enough time ❑ I'm not very interested in stress management ❑ I don't believe that stress affects health ❑ I received little training in stress management ❑ I am not confident in my ability to teach relaxation techniques ❑ I am not confident my patients will follow my stress management recommendations ❑ Lack of referral sources for stress management

Personal Health Practices

16. How often do you practice relaxation or stress reduction techniques?
    ❑ Routinely ❑ Sometimes ❑ Rarely ❑ Never—Skip to comments
17. *Which techniques do you use?* ❑ Diaphragmatic breathing ❑ Meditation ❑ Mindfulness ❑ Progressive muscle relaxation ❑ Imagery/visualization ❑ Exercise ❑ Other: _____

translate to discussing stress management with their patients. One reason may be that providers were twice as likely to believe that counseling patients about smoking, nutrition, or exercise was more important than counseling them about stress. When providers are faced with limited time to interact with their patients, a topic that is deemed only "somewhat" effective in improving their health is quite likely to never be mentioned. This belief, when coupled with the lack of confidence many providers reported in their ability to teach relaxation techniques to their patients or convince their patients to follow these recommendations, may reinforce the low priority of stress counseling for many providers.

The fact that providers of color were more likely to view stress as a very important patient counseling topic than caucasian providers is interesting, although we cannot explain this finding fully in the context of our study. However, we may hypothesize that providers of color may be more likely to experience personal stress as a result of racism in our society[48], and therefore may be more sensitive to its biopsychosocial implications. It is also possible that African-American providers (who make up 28% of our providers of color) may be more sensitive to issues related to stress and hypertension, given the higher rates of hypertension in the African-American community[49].

Although training in stress-related topics was not significantly correlated with the frequency of providing stress counseling to patients, the personal practice of stress management by providers (previous experience) was significantly associated with the perception that stress counseling is important (outcome evaluation), confidence in teaching relaxation techniques (self-efficacy), and the perception that stress management is effective in improving health outcomes (outcome expectation). These perceptions were then significantly correlated with the frequency with which providers discussed stress management with patients. Thus, while training may increase the provider's perception of the importance of stress counseling for patients, it may require the personal practice of stress reduction techniques to increase the frequency with which providers will actually provide such counseling.

Although the cross-sectional design of our study limits our ability to predict provider stress counseling, it does appear that current training strategies have been insufficient in increasing the frequency with which providers will offer stress counseling to patients. However, training that emphasizes the importance of stress management to health, encourages the personal practice of stress reduction techniques, and enhances confidence in teaching stress management may prove more effective. Thus intervening in several areas of provider training, perceptions, and skills may be required to improve the frequency of provider stress counseling.

Study Limitations

There are several limitations to our study. The instrument was intended for use as a needs assessment tool, so it was not tested for reliability or validity. Like all surveys, recall bias may affect respondents' ability to remember prior training on specific topics, especially if the question addresses something that is not easily quantifiable like stress training. We did not document training or self-instruction in stress reduction techniques obtained outside medical/professional school. Also, the design of our study involved mainly resident physicians in one academic training program, so our sample may not be representative of other residency programs or health care providers in general. However, it is our hope that by providing a sufficient description of the demographic characteristics of our study population, readers may make an informed decision regarding the generalizability of our findings to other similar groups.

Even though we did not obtain a random sample of all house officers, our response rate was high at 72%, and our results do reflect recent trends in medical education. These findings suggest that the primary components of the Social Cognitive Theory —specifically skill-building personal practice, positive outcome evaluation and outcome expectation, and high self-efficacy, are all constructs which support physician counseling practices. We believe these findings are also relevant to the training of future nurse practitioners and physician's assistants.

It is possible that the results of our study might have been different if the survey had been administered in a setting with providers who were not in an academic training setting, or providers who were seeing patients with a higher SES. Providers with more experience may be more likely to discuss psychosocial or lifestyle issues with their patients, but younger providers may be more likely to have the most up-to-date training on stress topics. Providers who serve patients with a higher socioeconomic status may feel more comfortable recommending techniques such as

meditation which their patients can obtain privately through out-of-pocket expenses. On the other hand, providers who serve patients with health insurance may be more hesitant to recommend a treatment that is not currently reimbursable through most health insurance companies. Only further research can determine the influence of these variables.

Implications for Medical/ Professional Education

In 1998, Dr. Herbert Benson testified to a U.S. Senate appropriations subcommittee that the biggest barriers to integration of mind/body therapies (such as stress management) are "the lack of knowledge of the existing scientific data among health care providers" and "a bias against mind/body interventions in medical care as being 'soft' science." He further stated, "the full integration of mind/body, self-care medicine is completely compatible with existing health care approaches"[50].

There is obviously a need for more medical/professional education on the relationship between stress and health outcomes. Since the ultimate goal is not just to increase knowledge, but to increase the frequency with which health care providers discuss stress management with their patients, providing training on the most recent research may not be sufficient. Perhaps the key is to combine training in the latest stress-related research and teaching actual stress reduction techniques. Having providers adopt their own stress reduction regimen may facilitate acceptance and confidence. This knowledge and skills acquisition might then result in attitude changes which affect the motivation (outcome evaluation), self-efficacy, and outcome expectations of the provider, resulting in a much higher incidence of discussion of stress management with their patients.

One barrier to increasing the frequency with which providers offer stress counseling is the lack of clinical practice guidelines. Many professional organizations, including the American Medical Association, the Agency for Health Care Research and Quality, and the American College of Sports Medicine, provide clinical practice guidelines to help health care providers counsel their patients on smoking cessation, diet, and exercise. But the American Medical Association, the American Institute of Stress, the International Stress Management Association and the American Psychological Association all confirm that there are currently no professional guidelines for health care providers on how to counsel their patients about stress. The creation of such guidelines should be a high priority for these organizations, as well as for credentialing organizations—such as the American College of Physicians, the American Academy of Family Practice, and others.

CONCLUSIONS

Much of the research on stress and health outcomes challenges the traditional "medical model". The body and mind can no longer be considered separate entities without interactive effects. A patient's individual perception of stress can be related to adverse outcomes in multiple disease states, thus a better understanding of how to ameliorate a patient's stress reactions to emotional, social, psychological, and environmental stimuli will enable health care providers to be more effective with their patients. There is a need for curriculum reform that teaches health care providers from the "biopsychosocial" perspective[51], emphasizing not only new knowledge about stress and disease but also new skills in stress reduction and more positive beliefs about mind/body medicine and its integration into the existing health care structure.

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