Stress in the Clinical Setting: The Brief Encounter Psychosocial Instrument

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Integration of knowledge regarding the relationship between stress and illness into clinical practice has been slowed by a lack of clarity in the definition of stress and the difficulties involved in rapid assessment of stress in a busy office setting. The stimulus, response, and interactional models of stress are discussed, and the development of a new stress measure, the Brief Encounter Psychosocial Instrument (BEPSI), is detailed. The reliability of this six-item instrument is demonstrated (Cronbach's alpha .80). Validity is measured through correlation with a variety of instruments measuring stress, including depression ($r = .52$, $P < .001$), anxiety ($r = .61$, $P < .001$), life change ($r = .56$, $P < .001$), bodily expression of stress ($r = .56$, $P < .001$), and a total stress score ($r = .67$, $P < .001$). The BEPSI also demonstrated appropriate negative correlations with family cohesion ($r = -.29$, $P = < .01$) and support ($r = .31$, $P = < .01$). When the single open-ended item is strongly positive, 77 percent of patients also score high on the BEPSI. A negative response to the same question corresponds to a low BEPSI value 52 percent of the time. Suggestions are made regarding clinical and research applications.

The relationship of stress to illness has been the subject of diverse and productive research that examines broadly different conceptualizations of stress across a wide variety of illnesses and medical outcomes. Despite the conceptual and methodological differences, a persistent relationship is documented.[1-3] Integration of theoretical knowledge about stress into practice has been slowed by confusion over its definition[4] and the inability to assess patient stress rapidly in a busy practice. This paper will discuss different constructs of stress, then describe the development, reliability, and validity of an instrument designed to assess quickly the content of stress in a clinical setting, the Brief Encounter Psychosocial Instrument (BEPSI).

Theories of stress can be labeled as stimulus oriented, response oriented, or interactional.[5,6] The stimulus-oriented construct views stress as a property of the environment that is imposed on the individual in a demanding or disorganizing manner. Stimulus-oriented research is epitomized by the Holmes and Rahe[7] Schedule of Recent Experience. Other measures involve daily hassles[8] or ontological sources of stress, ie, rejection, loneliness, or pain.[9]

The response orientation to stress postulates that it is not the mere presence of an external stressor, but rather the response of the individual to his environment that defines stress.[5] When response is equated with stress, it is usually measured by physical or psychological changes in the individual. This view often equates mental health with stress. Measures of the response orientation to stress include symptom checklists, disorganized function, affect and mood scales, and general psychological adjustment.

The interactional orientation emphasizes individual characteristics as the major mediators between environmental stimulus and the response evoked. This view has been described[6] as a lack of fit between the individual and his environment. Stress has been defined as "the anticipation of inability to respond adequately [or at reasonable cost] to a perceived demand, accompanied by anticipation of negative consequences for inadequate response,"[10] with the necessary and sufficient condition of stress the "cognitive appraisal of demand-capability imbalance."[4]

Simply put, stress occurs when an individual encounters demands that stretch his ability to respond appropriately. This conceptualization defines stress uniquely, different from environmental stressors (stimulus) and from affect

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or health-related symptoms (response) that have been used as markers of stress in the past. Human stress, when using this model, can be usefully compared with cardiovascular stress. The familiar Frank-Starling curve of cardiac function indicates that as venous return to the heart increases, the functional ability of the heart increases, resulting in greater cardiac output. If venous return is too small or too large, the heart can no longer operate efficiently, and cardiac output suffers. In parallel, one can substitute demand for venous return and individual "output" or capability for cardiac output. In this case, as demand increases, so does capability until the mismatch between demand and capability, at the high and low extremes of demand, becomes so marked that individual output diminishes.

There are many modifiers of the normal curve for both cardiac and human stress. Cardiac modifiers include central, peripheral, and hormonal input, cardiac blood supply, cardiac conduction system, peripheral resistance, and the urgency or chronicity of the cardiac demands. These variables can alter the capacity of the heart to handle venous return that would otherwise be within its capability. Modifiers of human stress, perhaps more complex and difficult to categorize, include the nature of the demand, familiarity with the demand, the individual's own expectations, the emotional valence of the demand, support, coping abilities, perception of the demand, perception of one's own capability, and perspective regarding the importance of the demand.

This model views stress as a normative phenomenon, harmful only in its extremes of demand underload or overload. There is evidence that the highest valence of stress occurs not at the widest mismatch between demand and capability, but at the top of the curve, when capability first begins to diminish. McGrath[11] maintains that the closer the perceived demand is to perceived ability when an imbalance is present, the greater the experience of stress. It is at this point, when the individual is uncertain regarding his ability to deal with the demands he faces, when he is confronted with the limitations of his own capability, that stress may have its greatest psychological and physiological effects.

THE BRIEF ENCOUNTER PSYCHOSOCIAL INSTRUMENT

The Brief Encounter Psychosocial Instrument (BEPSI) was conceptualized as a measure of the interactional model of stress. It was designed to be useful in a busy practice, with clinical and research utility for identifying patients at risk for negative health outcome related to their stress. The constructs measured by the BEPSI and the items utilized for their assessment are listed in the Appendix. These items are annotated below.

The first BEPSI item is open ended and sensitizing in nature, informing the patient of the link between illness and stress, offering a cursory explanation of the mechanism, and then asking the patient whether he believes that this model applies to his situation. This item offers an indication of current life changes or events, and adds a richness to the information gathered in the closed-ended question. It is scored simply by counting the number of different stresses the patient relates in response.

The remainder of the BEPSI items are closed ended. Patients were asked to respond yes or no to each item, and if yes, to rate the impact of these stressors on a scale of 1 to 10. The first closed-ended BEPSI item is basic to the interactional model of stress and assesses the individual's perception of the balance between external demand and capability.

Intrinsic demand is addressed by the second BEPSI item, recognizing the importance of the individual's expectations as demands one places on oneself. Mellion and Eliot[12] have, in fact, defined stress as "an internal stimulation that results from a mismatch between your expectations and the likelihood of achieving them in the real world."

The third BEPSI item addresses the balance of need and need fulfillment. Cox[6] has noted, "A person has psychological and physiological needs, and the fulfillment of these is important in determining his behavior. These needs constitute *internally generated demand.*" These needs represent the expectations and demands that the individual places on his physical or interpersonal environment. Studies[10,13] demonstrate that when frustration exists in the area of need most important to an individual, high stress and medical consequences occur.

Several studies have indicated that uncontrollable events elicit a greater stress response than demands over which the individual has control.[14,15] One study[16] examined not only control but also uncertainty of control, and found that the demands experienced as most stressful are not those that are uncontrollable but those that are of uncertain controllability. BEPSI item 4 addresses this demand uncertainty.

The final BEPSI item involves the perception of stress and the ability to maintain perspective in the face of demand. A common symptom of stress involves preoccupation with a demand or with capability to meet the demand that is out of proportion to the importance of the demand. This item emphasizes the cognitive appraisal of stress as opposed to actual levels and is labeled demand perspective.

METHODS

The reliability and validity of the BEPSI were measured as a part of a larger study examining the relationship between stress and respiratory tract infection.[17–19] Study participants included 86 patients with symptoms of respiratory tract infection presenting to 24 physicians at three family practice sites in an urban midwestern town.

Seventy-nine percent of the patient contacts were evenly distributed among 22 fourth-year medical students, first-year, second-year, and third-year residents, and faculty at the residency site, and 29 percent of patients were seen by two community physicians. The residency site is a suburban, predominately white, middle-class practice. The urban practices are predominately black, lower middle class, with a high proportion of prepaid patients.

All patients aged over 14 years presenting with symptoms of respiratory tract infection to the three study sites during a ten-week period from March through April 1984 (six weeks at the community sites) were asked to participate. Of 110 patients eligible, six declined to participate, for a response rate of 94.5 percent.

The BEPSI was administered to the study participants in one of three different methods: (1) by a physician during the standard patient visit, (2) in a self-administered form prior to the visit, or (3) retrospectively by a researcher during a telephone interview one week following the visit. Analysis of variance was used to determine whether differences in scores existed as a result of method of administration. In addition to the BEPSI, each participant completed a validation instrument immediately preceding or following his or her visit.

The instruments used to validate the BEPSI are annotated below. The validating instrument took approximately 20 minutes to complete and contains 137 items. There were 11 demographic questions and seven health-risk questions regarding tobacco and alcohol use in addition to the instruments detailed below.

The Air Traffic Controllers Schedule of Life Events[20] is a 12-item life-change scale that was adapted from the 42-item Holmes and Rahe[7] Schedule of Recent Experience. The subject was instructed to indicate whether the life-change item occurred during the previous three months, and if so, to rate how stressful the experience was for him on a five-point scale. This instrument is a stimulus-oriented measure of stress.

The Profile of Mood States (POMS)[21] is an adjective-checklist scale that asks participants to rate whether they have experienced a mood or feeling during the past week on a five-point scale. The entire POMS is a 65-item tool with six dimensions (tension-anxiety, depression-dejection, confusion, anger-hostility, vigor, and fatigue). Only the dimensions of anxiety (nine items) and depression (15 items) were used in this study. POMS is a response-oriented measure of stress that can be contrasted with measures based on psychiatric symptoms such as the Beck Depression Inventory[22] or the Zung Self-Rating Depression and Anxiety Scales.[23,24] Mood and affect tend to be more transitory in nature and therefore more sensitive to change.

The Bodily Expression of Stress Scale (BESS) is an instrument created for this study. The tool asks subjects to relate "how your body and your mind work together to tell you when you are under too much stress." There are 26 symptoms listed, and the patient is asked to rate how often he experiences these symptoms as a result of stress on a five-point scale. The scale performed well psychometrically, with a Cronbach alpha of .83 and with each item contributing to the scale. The BESS is considered a response-oriented measure that addresses somatic expression of stress.

TABLE 1. BRIEF ENCOUNTER PSYCHOSOCIAL INSTRUMENT DISTRIBUTION

Score	Absolute Frequency	Relative Frequency	Cumulative Frequency
0–1	11	12.8	12.8
1.01 to 2	20	23.2	36.0
2.01 to 3	19	22.1	58.1
3.01 to 4	9	10.5	68.6
4.01 to 5	13	15.1	83.7
5.01 to 6	8	9.3	93.0
>6.01	6	7.0	100.0
Total	86	—	—

Mean = 3.02; median = 2.72; standard deviation = 1.94

A scale derived from the Olsen Family Adaptability and Cohesion Scale (FACES) based on the circumplex model of family function[25] was used to assess family cohesion. Speagle[26] administered the FACES questionnaire in a family practice center and found that six questions accounted for 90 percent of the variance in the dimension of cohesion. These questions have good face validity as a measure of family cohesion and are used in this study as an indication of family function or support.

Three individual items were summed to produce a separate support score. These items involved (1) tangible assistance,[26] (2) access to a special person with whom to share problems, and (3) assessment of support received during the last stressful episode experienced by the respondent.

A total-stress score was arrived upon by summing the standardized scores on the air traffic controllers life-change scale, the POMS anxiety scale, the POMS depression scale, and the bodily-expression-of-stress scale. The total-support scale resulted from the sum of the support score and the cohesion score.

RESULTS

The study participants (n = 86) ranged in age from 14 to 77 years, with a mean of 34.4 years. The sample was 69 percent female, 80 percent white, 53 percent single, 59 percent with children, 64 percent employed, and 58 percent with high school education or less.

The distribution, mean, range, median, and standard deviation of the BEPSI are described in Table 1. The scores are the result of adding the frequency of response on the open-ended item (range 0 to 8, mean 2.6) to the total sum of the five closed-ended items (each scored 0 to 10 with No = 0) and dividing by the number of items (6). The BEPSI distributed in relatively even terciles, with an av-

TABLE 2. ANALYSIS OF VARIANCE OF BRIEF ENCOUNTER PSYCHOSOCIAL INSTRUMENT SCORE BY DEMOGRAPHIC VARIABLES

Variable	No.	Mean	F	P
Employment			2.7	.05
Full-time	40	2.7		
Part-time	10	3.4		
Housewife	13	4.3		
Other	17	2.5		
Education			3.4	.02
<High school	14	4.3		
High school	29	2.4		
Some college	17	2.9		
College or more	17	3.3		
Sex			4.4	.01
Male	28	2.4		
Female	58	3.3		
Race			6.8	.01
White	65	2.9		
Black	14	3.9		
Age (years)			0.3	.7
<29	36	3.2		
30 to 39	23	2.9		
>40	27	2.8		
Marital status			1.0	.42
Single	24	3.4		
First marriage or living together	30	2.7		
Divorced, widowed, separated	13	2.7		
Remarried	11	3.6		
Income			1.0	.38
<$10,000	30	3.5		
$10,000 to 20,000	21	3.4		
$20,000 to 30,000	10	2.3		
>$30,000	5	2.6		
Method of administration			1.3	.27
Interview	43	2.8		
Telephone	14	2.6		
Self-administered	26	3.5		

erage score of less than 2 considered low stress (36 percent), scores of 2 to 4 representing moderate stress (33 percent), and scores of greater than 4 indicating high stress (31 percent). Ninety percent of patients related at least one stress in response to the open-ended item, with 75 percent relating more than one stress, and 25 percent identifying more than three stresses. Only 9 percent of patients related no stress in response to the closed-ended questions. Of ten patients who reported no stress in response to the open-ended question, all but three reported some stress on the remainder of the BEPSI.

The BEPSI score varied to some degree based on demographic characteristics of the participants (Table 2). People reporting more stress on the BEPSI tended to be female, black, housewives, remarried, employed part-time, and of either low- or high-educational level. No significant associations with the total BEPSI score were found for age, marital status, income, or method of administration. The response of different demographic groups to individual BEPSI items was examined to identify which items were most effective for that group and support construct validity (Table 3). Demand-capability imbalance was reported more often by women, those with less than high school education, those who had a low income, housewives, and those who were remarried. Expectations-capability imbalance was correlated with college level or greater education, housewives, remarried, and part-time employed. Unmet needs were related more often by women, blacks, those with a low educational level, housewives, and those who remarried. Uncertainty seemed to be especially important for women, blacks, and those with a low educational level. Inability to maintain perspective correlated with youth, women, those with a low educational level, those with low income, and housewives.

BEPSI Reliability

The BEPSI exhibits good internal consistency, with a Cronbach alpha of .80 (standardized alpha .81), with each item contributing statistically to the total (Table 4). The

TABLE 3. PEARSON CORRELATIONS OF BRIEF ENCOUNTER PSYCHOSOCIAL INSTRUMENT ITEMS AND PATIENT CHARACTERISTICS

Characteristic	Demand	Expectation	Fulfillment	Uncertainty	Perspective
Age	−.01	−.04	−.08	−.13	−.17*
Female	.26*	.11	.28*	.21*	.15**
Black	.10	.07	.25*	.16**	.04
<High school education	.18*	.01	.20*	.27*	.32*
>College education	.07	.21*	.01	−.01	−.09
Low income	.15**	.12	.15**	.11	.25*
Housewife	.28*	.13**	.18*	.12	.28*
Remarried	.15**	.18*	.16**	.08	.06
Part-time employed	.06	.22*	.02	−.01	.02

* $P < .05$
** $P < .1$

TABLE 4. BRIEF ENCOUNTER PSYCHOSOCIAL INSTRUMENT RELIABILITY

Item	Corrected Item/ Total Correlation
Demand	.70
Expectation	.43
Need fulfillment	.71
Uncertainty	.54
Perspective	.51
Frequency of response	.53
Alpha = .80	

highest item-total correlation is exhibited by the need-fulfillment item and the lowest by the expectation item. The smallest amount of variance contributed by any single item was 18 percent (expectations).

Factor analysis by the principle axis method indicates that the BEPSI items cluster on a single factor and measure a common theme (eigen value = 2.21). Need fulfillment loaded most highly (.79), followed by demand-capability (.76), perspective (.62), uncertainty (.61), and expectation (.49).

BEPSI Validity

Correlations of the BEPSI, the closed-ended items alone, and the open-ended item alone are detailed in Table 5. High correlations with the closed-ended questions were noted for anxiety and total-stress score and moderately high correlations for depression, life change, and bodily expression of stress. Inclusion of the open-ended question improved correlation only with life change, while leaving correlation with the other instruments essentially unchanged. When considering only the open-ended question, correlations were lower but moderate, considering they were obtained using a single item. Importantly, correlation of the BEPSI with the total-stress score is higher than with any single instrument.

The BEPSI, as hypothesized, demonstrated moderate negative correlations with support and family cohesion (Table 6), indicating those under more stress tended to perceive less support and less cohesive families. These correlations were basically unchanged with inclusion of the open-ended question.

DISCUSSION

The importance of a tool for assessment of stress in a clinical setting is illustrated by the high content of psychosocial problems seen in primary care and physicians' relative inability to discover such problems. There is some difficulty comparing studies of prevalence of mental health disorders detected by mental health screening in primary care because of differences in measurement instruments

TABLE 5. PEARSON CORRELATIONS FOR THE BRIEF ENCOUNTER PSYCHOSOCIAL INSTRUMENT (BEPSI) CLOSED-ENDED ITEMS AND OPEN-ENDED ITEM WITH STRESS MEASURES

Instrument	BEPSI	Closed-ended Items Alone	Open-ended Item Alone
Anxiety POMS	.61	.60	.41
Depression POMS	.52	.55	.31
ATC Life Change	.56	.41	.41
BESS	.56	.53	.45
Total stress score	.67	.63	.46

P < .001 for all correlations
POMS—Profile of Mood States
ATC—Air Traffic Controllers
BESS—Bodily Expression of Stress Scale

TABLE 6. PEARSON CORRELATIONS FOR THE BRIEF ENCOUNTER PSYCHOSOCIAL INSTRUMENT (BEPSI) CLOSED-ENDED ITEMS AND OPEN-ENDED ITEMS, WITH SUPPORT AND COPING MEASURES

Instrument	BEPSI	Closed-ended Items Alone	Open-ended Item Alone
Family cohesion	−.29*	−.31*	−.23**
Support	−.31*	−.33*	−.18**
Total support	−.33*	−.33*	−.19**

** P < .01*
*** P < .05*

and in the variables examined. When screening for depression alone, prevalence ranges from 13 percent[28] to 42 percent.[29] With broader categories, such as depression and anxiety or psychiatric disorder, prevalence varies from 43 percent[30] to 85 percent.[31]

Further, the ability of the physician to uncover such problems when they exist is limited. A study of British general practitioners[32] found that only about 50 percent of the mental illness among their patients is detected, and among those diagnosed with mental disorders, over 50 percent originally presented with somatic complaints. Another study[33] reported that in visits initiated by patients, psychosocial problems accounted for 41 percent of the total problems seen while presenting as signal behavior 53 percent of the time and presenting frankly only 47 percent of the time.

In this initial testing, the BEPSI appears to be a reliable and valid instrument with good psychometric properties and high correlations with a wide variety of constructs related to stress. These characteristics exist despite administration of the tool by multiple providers, with varying levels of psychosocial interest and skills, and across varying methods of administration. The instruments the BEPSI was measured against were known by the patient to be confidential, while the patient knew the physician would be aware of the BEPSI results, suggesting a low social-desirability bias. The BEPSI appears to offer patients

an opportunity to express ubiquitous feelings regarding stress in a nonjudgmental manner and then to rate the difficulty generated by these feelings in a clinically meaningful way. Interpretation of results is limited because of the size of the sample and the specific nature of the visit (respiratory infection).

When examining the BEPSI, several points are noted. First, despite its conceptual importance, the expectation item consistently offers the lowest correlations. The item was originally worded, "In the past month have you ever felt that your expectations of yourself have been more than you are able to accomplish?" The emphasis placed on accomplishment rather than the feelings generated by high expectations is inconsistent with the other BEPSI items and may partly account for the low correlations. For this reason it is recommended that in future studies the item read as listed in the Appendix. The lower correlations for this item also epitomize the problem of using a stress score derived from a variety of models, all of which differ from the interactional model, as the "gold standard" against which to measure the BEPSI. It is reasonable to expect that high expectations may not be related to depression, anxiety, or life events, yet have great stressful impact on an individual. The BEPSI is designed to be sensitive to change and to levels of stress that may affect health behavior but not necessarily result in psychiatric morbidity.

A second question involves how to make best use of the BEPSI. In clinical practice, a single question sensitizing the patient to the relationship between stress and illness may be the quickest and therefore most viable option, and has been shown to correlate at moderate levels with far longer instruments. If the open-ended item produces a strongly positive response (four or more responses), from these data 77 percent of the patients would also have scored high on the closed-ended BEPSI items. Proceeding with further questions would offer only quantitative information. Conversely, if a patient answered with zero or one response, from these data only 52 percent of the patients indicated that they were in fact experiencing low stress on the closed-ended BEPSI items. Thus a negative response to the open-ended question is a less-effective predictor, and follow-up with the closed-ended items may be indicated. Alternatively, using the entire BEPSI in a self-administered manner prior to the visit may be less time-consuming and offer maximum information. In a research setting, the closed-ended items alone may offer the simplest option because coding of the open-ended item may be difficult.

Clinically, the BEPSI may be especially appropriate when the physician senses stress that the patient denies or when the patient admits frankly to feeling stress so as to quantify the magnitude. Many physicians recognize the importance of signal behavior, somatization, and hidden agendas in their patients.[33,34] It appears that use of the BEPSI could assist in uncovering stress that may have a significant effect on these health behaviors. With a positive BEPSI score one can have some confidence that the patient indeed has high stress even in the face of patient denial. With a negative BEPSI, it would be difficult to attribute the patient's complaints or symptoms to stress and may indicate a more careful workup. The BEPSI can also offer a structure around which to initiate short-term counseling or stress-reduction education when appropriate and can be used as a take-home tool by which the patient can monitor ongoing levels of stress.

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APPENDIX

The Brief Encounter Psychosocial Instrument (Physician Administered Form)

Open-ended sensitization item

In my practice I have often noticed that there is a strong relationship between stress and illness (use specific illness, or presenting complaint, if possible). Stress seems to knock down our body's defenses allowing illness to set in. Do you think anything like that is going on for you?

Closed-ended items

Extrinsic Demand (balance of external demand and capability): In the past month have you ever felt as if there are more demands in your life, emotionally and physically, than you can handle comfortably?

Intrinsic Demand (balance of self-expectations and capability): In the past month, have you ever felt frustrated trying to live up to your own expectations or standards?

Attributional Demand (balance of expectations attributed to the physical and interpersonal environment and fulfillment of these perceived needs): In the past month, have you ever felt that your needs as a person are being left unmet?

Demand Uncertainty (balance of security or controllability of demands and uncertainty regarding controllability of demands): In the past month have you ever felt uncertain or apprehensive about the future?

Demand Perspective (balance of demand and perspective) In the past month, have you ever felt that there are so many everyday hassles and crises that you lose track of the things that are really important to you?

Impact-of-Feelings Scale (following each closed-ended item): If yes, on a scale of 1 to 10, how much do these feelings bother or preoccupy you? One means not at all, ten means totally