Factors Influencing Health Perceptions in Patients With Panic Disorder

Norman B. Schmidt, Michael J. Telch, and Thomas E. Joiner, Jr.

Subjective perceptions of health have been found to be related to a variety of consequential variables including health care utilization and mortality. A number of studies have found that patients with panic disorder generally perceive themselves as having poor health. However, factors underlying self-perceptions of health are largely unexplored in this population. The present study examined three factors believed to contribute to health perceptions: (1) presence of comorbid medical conditions, (2) tendency to somaticize or worry about health, and (3) level of co-occurring depression. The sample consisted of 81 patients who met DSM-III-R criteria for panic disorder. An assessment battery that determined self-perceptions of health, level of depression, and the major clinical dimensions of panic disorder (i.e., panic attacks, anxiety, and phobic avoidance) was administered to all participants. As predicted, analyses indicated that each of the hypothesized factors was significantly related to poorer perceived health. Setwise hierarchical multiple regression analyses controlling for demographic variables indicated that health perceptions are strongly and independently associated with depression and the presence of a medical condition. Subjective health perceptions in panic disorder are multifactorial and are related to both realistic appraisals of health and distorted perceptions caused by depressed mood.

EPIDEMIOLOGICAL DATA suggest that panic disorder has a markedly negative impact on quality of life.[1] The effects of panic disorder on quality of life are comparable to the impact of major depression[1,2] and major medical conditions.[3] One index of quality of life is the subjective perception of health. Health perceptions affect health-seeking behaviors and utilization of health care, both of which are high among patients with panic disorder.[4] In addition, self-rated health has been found to predict mortality after controlling for actual health status.[5] In fact, health perceptions have been found to predict mortality better than health status assessed by physicians.[6]

Although patients with panic disorder generally perceive that they have poor health, the factors underlying self-perceptions of health are largely unexplored in these patients. It may be that patients with panic disorder are accurately appraising their health status. On the other hand, their perceptions may be distorted due to factors inherent to panic disorder or other related factors. We present several hypotheses regarding factors that potentially affect self-perceptions of health.

MEDICAL COMORBIDITY HYPOTHESIS

The relationship between panic disorder and perceptions of health is likely influenced by actual health status. The relationship between panic disorder and medical illness is complex. Medical conditions may contribute to the development of panic disorder,[7] and/or comorbid medical conditions may exacerbate panic disorder symptoms.[8] Epidemiological studies have found significantly higher rates of chronic medical conditions among anxiety disorder patients.[9] Thus, patients with panic disorder may be accurately appraising their health status. The medical comorbidity hypothesis predicts that negative health perceptions are due to the high rate of comorbid medical conditions among patients with panic disorder.

SOMATIZATION HYPOTHESIS

Another possibility is that negative health perceptions are due to a general tendency to worry about health. Panic-related worry and anxiety is central to the panic disorder syndrome,[10] and much of this worry is directed at health-related concerns (e.g., fear of dying and fear of heart attack). Many panic disorder

From the Department of Medical and Clinical Psychology, Uniformed Services University of the Health Sciences, Bethesda, MD; Department of Psychology, University of Texas, Austin; and Department of Psychiatry, University of Texas Medical Branch, Galveston, TX.

Supported by USUHS Grant No. CO72BN-01 (N.B.S.) and National Institute of Mental Health Grant No. MH74-600-203 (M.J.T.).

Address reprint requests to Norman B. Schmidt, Ph.D., Department of Medical and Clinical Psychology, Uniformed Services University of the Health Sciences, 4301 Jones Bridge Rd, Bethesda, MD 20901-4799.

0010-440X/96/3704-0001$03.00/0

patients believe that a panic attack will lead to catastrophic medical consequences such as heart attack or stroke.[11,12] Panic disorder patients worry more about bodily sensations[13] and have also been found to exhibit somatization traits[14] and hypochondriacal concerns.[15] Although it is unclear whether health-related anxiety is a cause or merely a consequence of panic attacks, the tendency to worry about health could contribute to a perception of poor health. Thus, a "somatization hypothesis" predicts that patients with panic disorder negatively appraise their health because of a general tendency to worry excessively and unrealistically about health.

DEPRESSION HYPOTHESIS

Depression is a prominent clinical feature in many patients with panic disorder. Patients with panic disorder often exhibit elevated levels of depression or meet diagnostic criteria for a co-occurring mood disorder.[16] Depression not only is associated with the tendency to view oneself negatively,[17] but it has been specifically linked with negative health perceptions. Thus, a depression hypothesis predicts that the negative health perceptions of patients with panic disorder are due to distortions caused by co-occurring depression.

The present study was designed to examine these various hypotheses to determine whether any of these factors account for the observed findings of perceived poor health among patients with panic disorder. We were interested not only in the unique relationship between each factor and health perceptions, but also in whether a combination of factors would predict health perceptions. Specifically, we predicted that each of the hypotheses would be supported, that is, comorbid medical conditions, panic-related worry, and cooccurring depression would be associated with perceptions of poor health. In addition, we hypothesized that these factors would have an additive effect such that patients with a combination of two or three factors (i.e., high levels of panic-related worry, depression, and a comorbid medical condition) would show significantly poorer health perceptions than patients with only one factor.

METHOD

Subjects

The sample consisted of 81 consecutive patients presenting at an academic research center who met the following entry criteria: (1) principal DSM-III-R axis I diagnosis of panic disorder, (2) at least one panic attack during the past 4 weeks, (3) no change in medication type or dose during the past 8 weeks, (4) no evidence of serious suicide intent, (5) no evidence of current substance abuse, and (6) no evidence of current or past schizophrenia, bipolar disorder, or organic mental disorder. A complete description of the study was furnished to the subjects and informed consent was obtained.

Procedure

Diagnostic assessment was based on an initial phone screening interview followed by a face-to-face structured clinical interview using the Structured Clinical Interview for DSM-III-R–Non-patient Edition.[18] Twenty-eight videotaped interviews were selected at random and assessed by an independent rater for reliability. κ coefficients were high for panic disorder diagnoses ($\kappa = 1.00$) and for all axis I diagnoses ($\kappa = .86$).

Assessment Battery

An assessment battery that determined self-perceptions of health, level of depression, and the major clinical dimensions of panic disorder (i.e., panic attacks, anxiety, phobic avoidance, and fear of fear) was administered to all participants. Perceived health was assessed using the General Health Survey (GHS).[19] The short form of the GHS is a 33-item self-report measure of perceptions about health. The GHS consists of six subscales. Three subscales measure perceptions of the impact of health on physical functioning, work functioning, and social functioning. Other subscales assess general perceptions of physical health, mental health, and pain. In addition, the GHS contains a checklist for assessing common medical illnesses and a 6-month history of visits to health professionals. The six subscales have shown acceptable reliability and validity in both patient and general populations. The clinical facets of panic disorder were assessed with the following measures: (1) the Sheehan Patient-Rated Anxiety Scale,[20] (2) the agoraphobia scale of the Marks and Mathews Fear Questionnaire,[21] and (3) the Anxiety Sensitivity Index.[22] Panic attacks were assessed using a prospective self-monitoring approach similar to that used in the study by Ballenger et al.,[23] which has been found to reduce overreporting bias. Subjects were provided with daily panic diary forms. For each panic episode, subjects were instructed to record the date, time, duration, severity, symptoms experienced, and setting parameters (e.g., place, activity, and whether accompanied). Panic attacks with three or fewer symptoms (i.e., limited symptom attacks) were not included in the panic attack count. Depression was assessed with the Beck Depression Inventory (BDI).[24] Panic-related health concerns were assessed using the physical concerns subscale of the Panic Appraisal Inventory (PAI)[12] (e.g., I may have a stroke, I may die, and I may have a heart attack).

Analysis Plan

To assess the study hypotheses, relationships between health perceptions and depression, somatization, and medical comorbidity were first analyzed separately. Additional setwise multivariate regression analyses were used to assess the independent and combined relationship between health perceptions and each of these factors. To control for type I error, multivariate analysis of variance (MANOVA) was used when appropriate. Bonferroni correction was used to correct within families of tests for the correlational analyses.

RESULTS

Description of Medical Comorbidity

Approximately half (46%) of all patients reported the presence of at least one chronic medical condition on the GHS. Of the patients reporting a medical condition, 62% (n = 23) reported one, 22% (n = 8) reported two, and 16% (n = 6) reported three or more (mean ± SD, 0.7 ± 1.0). Medical conditions reported included chronic back problems (44%), hypertension (26%), arthritis (21%), asthma (21%), irritable bowel syndrome (14%), ulcer (14%), heart condition (14%), and other (e.g., cancer, migraine, and diabetes, 21%). A substantial number of patients (40%) had seen a physician for a physical health problem in the past month, and most (88%) had visited a physician during the past 12 months. However, only 4% had been hospitalized for a medical condition in the past 6 months.

Comparisons between patients with and without comorbid medical conditions indicated that those with medical conditions had more visits to physicians ($F(1, 79) = 9.97$, $P < .01$) and to emergency rooms ($F(1, 79) = 4.13$, $P < .05$). There were no differences in number of mental health visits, frequency of hospitalization, or length of hospitalization ($P > .05$).

Relationship Between Medical Comorbidity and Psychiatric Symptoms

Clinical characteristics of patients with and without comorbid medical conditions were evaluated using a one-way MANOVA with medical comorbidity (yes and no) as the grouping factor and symptoms (e.g., anxiety, phobic avoidance, panic frequency, fear of fear, and depression) as dependent variables. Medical comorbidity was not significantly associated with psychiatric symptoms ($\lambda = 0.89$, $F = 1.61$, $P > .05$). Similarly, there were no group differences on the categorical clinical variables ($P > .05$). These findings indicate that the presence of a comorbid medical condition does not significantly alter the general symptomatic presentation among patients with panic disorder.

Relationship Between Health Perceptions and Health Care Utilization

Consistent with prior research, the overall level of perceived health was significantly associated with health care utilizaion. The GHS total score was correlated with four measures of health care utilization. In every case, poor perceived health was associated with significantly greater health care utilization as measured by number of mental health visits ($r = -.29$, $P < .01$), number of nonpsychiatric physician visits, ($r = -.34$, $P < .01$), number of emergency room visits ($r = -.33$, $P < .01$), and days hospitalized during the past 6 months ($r = -.27$, $P = .01$).

Relationship Between the Clinical Features of Panic Disorder and Health Perceptions

We examined the relationship between each of the major clinical features of panic disorder (i.e., panic attacks, anxiety, panic-related avoidance, and fear of fear) and health perceptions to determine whether individual facets of panic disorder were differentially associated with health perceptions. The panic attack frequency data were highly skewed, and were therefore normalized using logarithmic transformation. As expected, panic disorder symptom variables were moderately to highly associated with each other (range, .26 to .56). The level of association among these symptoms is consistent with the idea of separate but related clinical features that comprise an overarching syndrome.

Examination of the associations between panic disorder symptoms and health perceptions indicated a clear pattern. Anxiety level, as measured by the Sheehan Patient-Rated Anxiety Scale (SPRAS), was the clinical feature most highly associated with health perceptions. After Bonferroni correction, SPRAS scores were significantly associated with perceptions of physical health ($r = -.33$, $P < .002$), mental health ($r = -.58$, $P < .002$), and pain ($r = -.33$, $P < .002$), as well as with social functioning ($r = -.34$, $P < .002$) and the overall GHS score

($r = -.39$, $P < .002$). Negative correlations indicated that more severe symptoms were associated with more negative perceptions of health. Fear of fear was significantly correlated with perceived mental health ($r = -.40$, $P < .002$). Panic frequency and phobic avoidance were not significantly associated with health perceptions.

Relationship Between Medical Comorbidity and Health Perceptions

The relationship between medical comorbidity and health perceptions was assessed using a one-way MANOVA with medical comorbidity (yes and no) as the grouping factor and the six subscales of the GHS as dependent variables (Table 1). This analysis was significant ($\lambda = 0.91$, $F = 8.05$, $P < .01$). Univariate tests showed that patients with comorbid medical conditions reported poorer physical functioning ($F(1, 79) = 18.2$, $P < .0001$), poorer social functioning ($F(1, 79) = 4.13$, $P < .05$), and poorer vocational functioning ($F(1, 79) = 3.86$, $P = .05$). Patients with comorbid medical conditions also perceived themselves to be in poorer physical health ($F(1, 79) = 6.56$, $P < .05$) and in greater pain ($F(1, 79) = 14.4$, $P < .001$). However, there were no group differences in perceived mental health ($F(1, 79) = 0.09$, $P > .05$).

Relationship Between Somatization and Health Perceptions

The somatization hypothesis was assessed by examining the relationship between panic-related health concerns and health perceptions. Zero-order correlations indicated that PAI physical concerns scores were significantly correlated with perceptions of mental health ($r = -.35$, $P < .01$) and overall GHS scores ($r = -.23$, $P < .05$). Negative correlations indicate that higher panic-related physical concerns are associated with more negative perceptions of health.

Table 1. Relationship Between Comorbid Medical Conditions and Health Perceptions (mean ± SD)

GHS Subscale	Panic Disorder	Panic Disorder With Medical Condition	F
Perceived physical health	65.4 ± 22.7	52.6 ± 22.0	6.56*
Perceived mental health	53.3 ± 18.1	52.1 ± 19.1	0.09
Perceived pain	79.1 ± 22.0	59.6 ± 25.5	14.4†
Physical functioning	93.3 ± 15.4	75.5 ± 22.9	18.2†
Vocational functioning	82.9 ± 30.4	68.6 ± 37.4	3.86
Social functioning	86.8 ± 20.7	76.2 ± 27.3	4.13*

NOTE. Higher scores on GHS subscales indicate better health (range, 0-100).

*$P < .05$.

†$P < .001$.

Relationship Between Depression and Health Perceptions

We examined whether the level of depression was associated with health perceptions. Examination of zero-order correlations indicated that BDI scores were significantly and highly correlated with perceptions of mental health ($r = -.66$, $P < .0001$), overall GHS scores ($r = -.46$, $P < .0001$), perceptions of physical health ($r = -.43$, $P < .0001$), and social functioning ($r = -.41$, $P < .0001$). BDI scores were significantly and moderately correlated with vocational functioning ($r = -.32$, $P < .01$), perceptions of pain ($r = -.30$, $P < .01$), and physical functioning ($r = -.27$, $P < .05$).

Unique Relationship Between Medical Comorbidity, Somatization, Depression, and Health Perceptions

Our findings provide support for each of the individual hypothesized factors and suggest that health perceptions are related to the presence of comorbid medical conditions, panic-related health concerns, and depression. We also evaluated the unique relationship of these factors to health perceptions and conducted exploratory analyses assessing the relationship between the interactive effects of these variables and health perceptions.

We first examined the relationship between demographic variables and health perceptions. Each demographic variable was regressed separately on the GHS overall score. Older patients reported significantly poorer health ($r = -.31$, $t(81) = -2.89$, $P < .01$), as did females ($r = -.22$, $t(81) = -2.00$, $P < .01$) and divorced patients (compared with never-married patients, $r = -.28$, $t(81) = -2.64$, $P < .05$). Ethnicity and education were not significant predictors of health perceptions ($P > .05$).

A setwise hierarchical multiple regression procedure was used to evaluate the unique contributions of each of the factors. Separate

models were constructed for each GHS subscale and for the overall GHS score. Age, sex, and marital status were entered first as a set of covariates. Because anxiety symptoms were also significantly associated with health perceptions, the SPRAS was entered as an additional covariate in the first set. Next, BDI, PAI physical concerns, and medical comorbidity (yes = 1, no = 0) were simultaneously entered as a set. At step 3, an exploratory set of two-way interactions (i.e., medical comorbidity × BDI, medical comorbidity × PAI physical concerns, and BDI × PAI physical concerns) were entered. Testing for interactions among the variables does not assess additive effects. Additive effects are indicated by two or more significant partial correlations in the tests for main effects. The three-way interaction between medical comorbidity, BDI, and PAI physical concerns was entered as the final step.

Table 2 shows analyses for the overall GHS score. After controlling for sex, age, marital status, and SPRAS, both the BDI ($r = -.30$, $t(75) = -2.76, P < .01$) and medical comorbidity ($r = .26$, $t(75) = 2.44, P < .05$) were significantly related to overall GHS score. The BDI added 4% to the model predicting overall GHS, and medical comorbidity contributed an additional 5% to the model, for an overall R^2 of .41. However, the PAI physical concerns scale was not significantly associated with overall GHS beyond the effects of the BDI and medical comorbidity ($P > .05$). The interaction sets were not significant.

This same pattern of findings emerged for the subscales of the GHS. After controlling for demographic variables and anxiety symptoms, the BDI and the presence of a comorbid medical condition uniquely predicted physical functioning (BDI, $r = -.24, t(75) = -2.18, P < .05$; medical condition, $r = .36$, $t(75) = 3.38$, $P < .01$), vocational functioning (BDI, $r = -.24$, $t(75) = -2.16$, $P < .05$; medical condition, $r = .22, t(75) = 2.04, P < .05$), social functioning (BDI, $r = -.29$, $t(75) = -2.69$, $P < .01$; medical condition, $r = .22$, $t(75) = 2.02$, $P < .05$), perceptions of physical health (BDI, $r = -.33, t(75) = -3.16, P < .01$; medical condition, $r = .33, t(75) = 3.08, P < .01$), and pain (BDI, $r = -.23, t(75) = -2.10, P < .05$; medical condition, $r = .32$, $t(75) = 3.06$, $P < .01$).

Table 2. Unique Contributions of Medical Comorbidity, Somatization, and Depression Symptoms in Predicting Health Perceptions

Predicted Variable	F for Set	*t* for Within-Set Predictors	*df*	β	Pr/pr
CHS overall					
Covariates	6.73§		4,80		.56
Age		−2.89†	80	−4.26	−.36
Sex		−1.40	80	−17.30	−.15
Marital status		1.20	80	24.27	.13
SPRAS		−3.06†	80	−1.32	−.32
Main effects	3.71*		3,77		.36
BDI		−3.86‡	77	−4.89	−.40
Medical condition		2.61†	77	27.44	.28
PAI physical concerns		−0.06	77	−0.01	−.01
Two-way interactions	0.00		3,74		.00
Medical condition × PAI		0.39	74	0.65	.07
Medical condition × BDI		−0.61	74	−1.19	−.07
PAI × BDI		0.14	74	0.01	.02
Three-way interaction	0.00		1,73		.00
Medical condition × PAI × BDI		0.09	73	0.01	.01

Abbreviations: Pr, partial *r* for the set; pr, partial *r*.
*$P < .10$.
†$P < .01$.
‡$P < .001$.
§$P < .0001$.

Perceived mental health was significantly predicted by only the BDI ($r = -.44, t(75) = -4.41$, $P < .0001$). There were no other significant main effects, and there were no significant interactions.

DISCUSSION

Although epidemiological studies have established a linkage between panic disorder and perceptions of poor health, this report represents one of the first attempts to evaluate factors underlying this relationship. We examined three factors believed to affect health perceptions, namely medical comorbidity, somatization, and depression. Our findings suggest that each of these factors relate to health perceptions in the predicted direction. Moreover, examination of the unique association of each factor with health perceptions indicated that perceptions of poorer health are highly

associated with level of depression and medical comorbidity. Somatization, as indexed by panic-related health concerns, was no longer significantly associated with perceived health after controlling for the effects of depression and medical comorbidity. The independent contributions of medical comorbidity and depression to perceived health offer partial support for the hypothesis that these factors have unique and additive effects on health perceptions.

Of the three factors assessed, our findings suggest that the level of depression was the factor most strongly associated with health perceptions. The r value of $-.40$, when controlling for demographic and clinical variables, indicates that the unique association of depression with health perceptions is substantial. This finding is consistent with those of Connelly et al.[25] indicating that primary-care patients with poorer perceived health report elevated levels of depression. However, these findings run counter to the Epidemiological Catchment Area study, which found that the presence of a cooccurring depression diagnosis among patients with panic disorder did not significantly affect health perceptions.[1] To further investigate this discrepancy, we conducted an additional analysis of health perceptions for patients with and without a cooccurring major depression diagnosis. Consistent with findings from the Epidemiological Catchment Area study, overall health perceptions were not significantly different between groups ($F(1, 81) = 1.13, P > .05$). This suggests that diagnostic status may underestimate the association between depression and health perceptions.

What is the nature of the linkage between depression and negative health perceptions? Although we have suggested that depressed mood may create negative health perceptions, depression may also be a consequence of believing that one suffers from poor health. In all likelihood, a prospective study would indicate a bidirectional causal relationship between depression and health perceptions. Further delineation of this association has both conceptual and clinical importance.

The medical comorbidity hypothesis also received substantial support, since patients with co-occurring medical conditions reported poorer health. This finding suggests that perceived health is based, in part, on realistic appraisals of actual health status. However, firm conclusions regarding this finding need to be tempered, due to our reliance on self-reports of medical conditions versus objective health measures obtained from a comprehensive physical examination. This methodological limitation leaves open the possibility that negative health perceptions may lead patients to report spurious medical diagnoses. Another possibility is that negative health perceptions may lead to higher rates of physician visits, which could lead to greater rates of false-positive diagnoses. Our data, as well as results from other studies,[1,26] indicate that health perceptions are related to increased health care utilization. Despite these potential problems, self-reported health has been shown to be significantly associated with actual health status.[6,27] For example, Bradford et al.[28] found that only 4% of their patient sample had significant discrepancies between self-reported medical conditions and documented medical histories. Thus, we are reasonably confident that self-reported chronic medical problems represent an accurate self-assessment of health status.

The somatization hypothesis received only partial support in the present study. On one hand, panic-related physical concerns were significantly associated with perceived health. However, panic-related physical concerns were not uniquely associated with health perceptions after controlling for demographic variables, anxiety, depression, and medical comorbidity. This suggests that somatization, as measured by panic-related physical concerns, is associated with perceived health, but not to a sufficiently independent degree from these other factors. However, the present study used a fairly specific measure of somatization (i.e., appraisals regarding physical consequences of panic). Before we can conclude that somatization is not uniquely predictive of health perceptions, future research should incorporate other, broader measures of somatization, such as those used to index somatization traits or hypochondriacal concerns.[14]

Our results shed light on the symptom features of panic disorder that are associated with subjective health perceptions. Only anxiety symptoms showed a clear and consistent relationship with health perceptions. This suggests

that because of the infrequency and transient nature of panic attacks, these may have less impact on health perceptions than the more chronic and pervasive symptoms of anxiety. These findings are consistent with earlier research indicating that anxiety, but not panic frequency, is associated with other quality-of-life measures. This does not suggest that panic attacks are unimportant in the pathogenicity of panic disorder. On the contrary, evidence from diverse sources points to the centrality of panic attacks in mediating patients' chronic anticipatory anxiety and phobic avoidance. However, our findings do indicate that once panic disorder is present, anxiety symptoms produce the greatest negative impact on patients' subjective impressions of health.

The present study points to the complex interplay between panic disorder and co-occurring mood and medical conditions. The relationship between panic disorder and co-occurring psychiatric conditions, particularly mood disorders, has received considerable attention.[29] The relationship between panic disorder and medical illness is also receiving increasing attention.[9] However, relatively few studies have examined the relationship between panic disorder, other psychiatric conditions, and medical conditions. One such study found that patients with an anxiety condition plus a current or past history of major depression have a significantly increased risk for a medical disorder diagnosis compared with patients with no history of a mood disorder.[30] In the present study, medical factors and psychiatric factors both independently contributed to the psychological variable of interest (i.e., health perceptions), suggesting that the phenomenology of panic disorder requires the delineation of medical, psychiatric, and psychological factors.

There is accumulating evidence that patients with panic disorder are at increased risk for mortality.[31,32] The relationship between subjective health perceptions and mortality has been well established.[5] In fact, subjective health perceptions have been found to be the single best predictor of mortality in some studies. The present study suggests that subjective health perceptions may be determined by a variety of factors and calls for further elucidation of these and other factors that are related to mortality in this population.

One question raised by the present study is whether subjective health perceptions can be modified or normalized through successful treatment of panic disorder. There are a variety of effective biological and psychological treatments for panic disorder.[33] In fact, successful treatment of panic disorder has a profound effect on many different quality-of-life domains. To our knowledge, the effect of treatment on health perceptions among patients with panic disorder has not been systematically evaluated. Findings from the present study suggest that remission of anxiety symptomatology per se may not be sufficient for normalizing subjective health perceptions, due to the substantial linkage between health perceptions and depression. On the other hand, effective treatment of panic disorder often produces clinically significant changes in depression symptoms. In any case, subjective health perceptions constitute an important treatment outcome variable to be considered in evaluating recovery status.

ACKNOWLEDGMENT

We acknowledge the helpful comments of Drs. David Krantz and Wijo Kop on an earlier draft of the manuscript.

The opinions or assertions contained herein are the private views of the authors and are not to be construed as official or reflecting the views of the Department of Defense or the Uniformed Services University of the Health Sciences.

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