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# Psychosocial attributes

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## **PSYCHOSOCIAL ATTRIBUTES**

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### **ECONOMIC DIVERSITY IN MEDICAL EDUCATION: THE RELATIONSHIP BETWEEN STUDENTS' FAMILY INCOME AND ACADEMIC PERFORMANCE, CAREER CHOICE, AND STUDENT DEBT**

*Raelynn Cooter, James B. Erdmann, Joseph S. Gonnella, Clara A. Callahan,  
Mohammadreza Hojat, Gang Xu*

Providing access to higher education across all income groups is a national priority. This analysis assessed the performance, career choice, and educational indebtedness of medical college students whose educational pursuits were assisted by the provision of financial support. The study looked at designated outcomes (academic performance, specialty choice, accumulated debt) in relation to the independent variable, family (parental) income, of 1,464 students who graduated from Jefferson Medical College between 1992 and 2002. Students were classified into groups of high, moderate, and low income based on their parental income. During the basic science years, the high-income group performed better; however, in the clinical years, performance measures were similar. Those in the high-income group tended to pursue surgery, while those in the low-income group preferred family medicine. The mean of accumulated educational debt was significantly higher for the low-income group. The study provides support for maintaining economic diversity in medical education.

Evaluation & The Health Professions. 2004; 27(3): 252-264.

Available online at publisher's site:

<http://ehp.sagepub.com/cgi/content/abstract/27/3/252>

**CHARACTERISTICS OF MEDICAL STUDENTS COMPLETING AN HONORS PROGRAM IN PATHOLOGY**

*Bruce A. Fenderson, Mohammadreza Hojat, Ivan Damjanov, Emanuel Rubin*

The Honors Program in pathology at Jefferson Medical College provides a voluntary enrichment opportunity for students who have demonstrated a superior ability to cope with the pathology curriculum and who rank in the upper fifth of their class. This study was performed to determine whether honor students possess cognitive and psychosocial attributes that distinguish them from their classmates. Students from five academic years (entering classes 1991 to 1995) were divided into 3 groups: (1) those who completed the Honors Program (n=85), (2) those in the top 20% of the class who were offered the option but chose not to participate in the Honors Program (n=128), and (3) students who did not qualify for the program (n=953). Comparisons between these three groups were made on the basis of selected measures of academic achievement retrieved from the Jefferson Longitudinal Study database and psychosocial data obtained from a questionnaire completed during the first-year orientation. Students who completed the Honors Program in pathology had scored higher on the physical science section of the Medical College Admission Test (MCAT) and had obtained higher first-year grade point averages than students in both of the other groups. Subsequently, they attained higher second-year grade point averages and scored higher on Step 1 and Step 2 of the United States Medical Licensing Examination (USMLE), compared with their peers in the other groups. There were no significant differences in psychosocial measures between honor students and the rest of the cohort (group 3). However, students in the top 20% of the class who declined the invitation to participate in the Honors Program (group 2) showed higher scores on the Taylor Manifest Anxiety Scale and the Eysenck Emotional Instability (Neuroticism) Scale than did their classmates. Despite these differences, students who completed the Honors Program (group 1) and eligible students who declined participation (group 2) selected similar pathways of postgraduate residency training: both groups preferred internal medicine to family practice, and both were more likely than the rest of the cohort to begin residency training at a top-ranked academic/research medical center. Voluntary participation in an Honors Program is a self-selection system that identifies students who are most likely to succeed academically at the highest levels. Residency selection committees may wish to pay close attention to student involvement in similar programs, because this information may provide insights into student personality and general aptitude.

*Human Pathology. 1999; 30(11): 1296-1301.*

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[http://dx.doi.org/10.1016/S0046-8177\(99\)90059-X](http://dx.doi.org/10.1016/S0046-8177(99)90059-X)

### **BIOTECHNOLOGY AND ETHICS IN MEDICAL EDUCATION OF THE NEW MILLENNIUM: PHYSICIAN ROLES AND RESPONSIBILITIES**

*Joseph S. Gonnella, Mohammadreza Hojat*

Although the medical education curriculum varies internationally, we suggest that it is desirable for medical educators to share a universal responsibility to prepare physicians to perform three distinct yet interrelated professional roles. The first is that of a clinician who has the knowledge and technical skills to care for individual patients as well as the public. The second role can be viewed as that of an educator, a teacher, or a consultant who has the interpersonal skills and personal qualities to teach, advise, and counsel patients and the public about their health and illness, risk factors, and healthy lifestyle. The third role is that of a resource manager to enable physicians to care for patients and serve the public not only by drawing on available material assets but also by prudent use of the resources for better serving the most number of people at the least expense without compromising the quality of care. The very nature of the medical profession also obligates medical educators throughout the world to sensitize medical students and physicians to the ethical responsibilities that are implicit to each of the three aforementioned roles. Although the basic ethical responsibilities of do no harm and confidentiality are universal, certain global changes, such as rapid advancements in biotechnology and resource allocation, are now reshaping medical ethics on every continent. Spawned by the rapid advances in the biomedical sciences, biotechnology is revolutionizing human reproduction, sustaining human life, cloning human beings, and mapping the entire human genetic terrain. These advances imply changes in medical education and the formal preparation of physicians in performing their roles as clinicians, educators, and resource managers. These biotechnological developments, coupled with the increasing cost of health care and maldistribution of resources worldwide, present unprecedented ethical-social challenges that need to be addressed in the education of the physician in the new millennium.

*Medical Teacher. 2001; 23(4): 371-377.*

Available online at publisher's site:

<http://taylorandfrancis.metapress.com/openurl.asp?genre=article&id=doi:10.1080/01421590120042982>

**MEDICAL STUDENTS' OPINIONS ON ECONOMIC ASPECTS OF THE HEALTHCARE SYSTEM**

*Mary W. Herman*

Responses of 423 freshmen and 410 seniors at Jefferson Medical College in 1980-81 and 1982-83 to 15 questions on economic aspects of the healthcare system were compared. A majority of the students considered the cost of medical care, the cost of medical education, malpractice claims, and the failure of individuals to assume responsibility for their health to be major problems. A majority of the seniors also considered excessive government influence on the financing of medical care a major problem. More freshmen than seniors favored national health insurance and health maintenance organizations. More seniors than freshman supported the professional standards review organization concept and action to discourage increases in the supply of physicians. Concern about the number of physicians entering the profession increased among seniors between 1981 and 1983. The data suggest that at graduation the students were more concerned about the position of physicians but might not be more informed about important aspects of the functioning of the healthcare system than they were at entry.

*Journal of Medical Education. 1985; 60: 431-438.*

*Also in Proceedings of the Twenty-third Annual Conference on Research in Medical Education, Chicago, IL, October 1984; 329-334.*

### MEDICAL STUDENTS' OPINIONS CONCERNING THE HEALTHCARE SYSTEM

*Mary W. Herman*

The opinions of freshman and senior medical students on major health system problems and policies were investigated in 1980-81. Responses of 214 freshmen and 203 seniors are reported in four major areas: (1) physician dominance of the healthcare system, (2) autonomy in patient care, (3) availability of services, and (4) preventive and social aspects of care. With respect to physician dominance, more seniors (63%) than freshman (44%) agree that physicians should determine health policy and that dominance over other health personnel is necessary (75% and 61% respectively). Professional review of patient care is generally acceptable to both classes, but more freshmen than seniors agree that evaluation should be a condition for relicensure. Less than a fifth of the students in either class believe that patients should be told as little as possible or that they should accept the authority of doctors without question. More freshmen than seniors consider the availability of medical care a major problem (76% and 58% respectively), and similar proportions believe it is the responsibility of government to assure access to all. Freshmen and seniors generally agree on the need for greater emphasis on prevention and social aspects of illness. Because of the important role played by physicians in the healthcare system, it is recommended that serious attention be devoted to education in this area, even though it may have a limited impact on professional attitudes.

*The Journal of Community Health. 1984; 9(3): 196-205.*

Available online at publisher's site:

<http://www.springerlink.com/openurl.asp?genre=article&id=doi:10.1007/BF01326700>

**PROFESSIONAL ATTITUDES AND INTERPERSONAL RELATIONSHIPS  
OF PHYSICIANS: ARE THEY A PROBLEM?**

*Mary W. Herman, J. Jon Veloski, Mohammadreza Hojat*

The study used the ratings of recent graduates from Jefferson Medical College to address two questions of major importance to medical educators: 1) How extensive is the problem of poor professional attitudes, and 2) are low ratings on professional attitudes associated with low ratings in other areas of competence? The study sample comprised 496 individuals who graduated in the years 1978 through 1980. Ratings were obtained from hospitals in which the graduates took their first year of postgraduate training. Fewer than 5 percent of the graduates received the lowest possible rating on any item, and the majority of the 5 percent received the lowest rating on ability to handle anxiety-producing situations, admit to an error in judgment, devote sufficient time to their work, seek help when needed, and relate to other healthcare personnel. The ratings were then related to whether or not the rating institution would offer the resident further training. Ninety percent of the sample would be made such an offer. Only those graduates with low ratings in all four noncognitive areas were likely not to be offered further residency training. Ratings on professional attitudes were more closely related to the residency offers than were the ratings on knowledge or data gathering skills, but ratings on clinical judgment were more important than professional attitudes. The study supports the view that there is a problem of poor professional attitudes among physicians, and this problem is not always associated with poor performance in other areas. It can be concluded that, despite the difficulties involved in evaluating clinical competence, regularly obtained ratings from a number of observers can provide adequate information for remedial action, and it is important that medical schools assume this responsibility.

*Proceedings of the Twenty-First Annual Conference on Research in Medical Education, Washington, DC, 1982: 117-120.*

### **SATISFACTION WITH EARLY RELATIONSHIPS WITH PARENTS AND PSYCHOSOCIAL ATTRIBUTES IN ADULTHOOD: WHICH PARENT CONTRIBUTES MORE?**

*Mohammadreza Hojat*

The relationships between perceived satisfaction with early relationships with parents and adults' psychosocial attributes were addressed in this study. The participants were 928 medical students (37% women) who completed a set of personality questionnaires. The results indicated that perceived satisfaction with the mother in childhood was significantly associated with less intensity and chronicity of loneliness, less depression, less anxiety, a less negative view of stressful life events, higher self-esteem, and more satisfaction with peer relationships. No significant association was found between perceived satisfaction with the father and these personality measures. The results are discussed in the context of attachment theory and internal working models.

*Journal of Genetic Psychology. 1998; 159: 203-220.*

Available online at publisher's site:

<http://pqasb.pqarchiver.com/heldref/access/29543590.html?dids=29543590:29543590:29543590:29543590&FMT=ABS&FMTS=ABS:FT:TC:PAGE&date=Jun+1998&pub=The+Journal+of+Genetic+Psychology&startpage=203>

**PERCEPTION OF MATERNAL AVAILABILITY IN CHILDHOOD AND  
SELECTED PSYCHOSOCIAL CHARACTERISTICS IN ADULTHOOD**

*Mohammadreza Hojat*

The associations between reported perception of maternal availability in childhood and a set of psychosocial measures in adulthood were examined. Participants were 362 medical students who were divided into three groups based on their retrospective report of maternal availability before their 50th birthday: Mothers mostly available (n=260), partly available (n=70), and mostly unavailable (n=32). Those with mostly unavailable mothers scored significantly higher on the intensity and chronicity of loneliness scales, reported more depression, scored lower on self-esteem, perceived themselves as less healthy, evaluated the same stressful events more negatively, and perceived both of their parents more negatively than those with mostly available mothers.

*Genetic, Social, and General Psychology Monographs. 1996: 122: 425-450.*

Available online at publisher's site:

<http://pqasb.pqarchiver.com/heldref/access/7268345.html?dids=7268345&FMT=ABS&FMTS=ABS&date=Jul+1990&pub=The+Journal+of+General+Psychology&startpage=241>

### **MEDICAL STUDENTS' PERSONAL VALUES AND THEIR CAREER CHOICES A QUARTER-CENTURY LATER**

*Mohammadreza Hojat, Timothy P. Brigham, Edward Gottheil, Gang Xu, Karen Glaser, J. Jon Veloski*

A longitudinal study of 391 physicians tested two hypotheses regarding personal values and career choices: that higher preference for social values would be associated with physicians' being more interested in "people-oriented" rather than "technology-oriented" specialties and that higher preference for economic values would be associated with expectations of high income. The physicians (344 men, 47 women) were graduates of Jefferson Medical College in 1974 and 1975 who completed the Allport-Vernon-Lindzey Study of Values during medical school. Analysis showed that physicians currently in the "people-oriented" specialties scored significantly higher on the Social Value scale than their peers in "technology-oriented" specialties. A moderate but statistically significant correlation was found between scores on the Economic Value scale and expectations of higher income. The findings suggest that physicians' personal values are relevant to their career decisions such as specialty choice and expectations of income. The findings have implications with regard to two major issues in the evolving healthcare system, namely, the distribution of physicians by specialty and cost containment.

*Psychological Reports. 1998; 83: 243-248.*

**STUDENTS' PERSONALITY AND RATINGS OF CLINICAL COMPETENCE  
IN MEDICAL SCHOOL CLERKSHIPS: A LONGITUDINAL STUDY**

*Mohammadreza Hojat, Clara A. Callahan, Joseph S. Gonnella*

This study was designed to examine the associations between students' personality and assessments of their clinical competence in medical school. A set of questionnaires was completed by 1,710 medical students to measure their self-esteem, sociability, loneliness, general anxiety, test anxiety, neuroticism (emotionality), perceptions of early relationships with parents, and general health. Students were divided into three groups of the low, moderate, and high competent based on the number of 'honors' ratings they received in core clinical clerkships during their third year of medical school. Multivariate statistical analyses showed that the low competent students scored significantly lower on the self-esteem and sociability, but higher on the loneliness scale. The low competent students also perceived their early relationships with their parents as less satisfactory. Findings suggest that medical students' clinical competence assessments are associated with some aspects of their personality and with perceptions of early relationships with their parents. Findings have implications for the development of educational remedies and counseling strategies.

*Psychology, Health & Medicine. 2004; 9(2): 247-252.*

Available online at publisher's site:

<http://www.journalsonline.tandf.co.uk/openurl.asp?genre=article&id=doi:10.1080/13548500410001670771>

### **A STUDY OF PSYCHOMETRIC CHARACTERISTICS OF ABRIDGED VERSIONS OF SELECTED PSYCHOLOGICAL MEASURES GIVEN TO MEDICAL SCHOOL STUDENTS FOR THE PURPOSE OF PREDICTING THEIR CLINICAL COMPETENCE**

*Mohammadreza Hojat, James B. Erdmann, Mary R. Robeson, Ivan Damjanov, Karen Glaser*

This study was designed to investigate the psychometric characteristics of abbreviated versions of nine psychological scales for medical school students' population. The scales and their items were selected based on their relevance to academic performance and their established psychometrics. Five items were chosen from each of the following scales: The UCLA loneliness scale, test anxiety, general anxiety, self-esteem, extroversion, external locus of control, neuroticism, and stressful life events scales. In addition to these scales, the abridged version of the Beck depression inventory and a questionnaire were given to medical students, 199 of whom returned their completed set of the instruments. Descriptive statistics, alpha reliability, and construct and concurrent validities are reported. Correlations among psychological scales, reproducibility of the findings, and validation of the instruments by contrast groups are examined. Preliminary analyses indicated that the psychological measures contributed to the prediction of performance and clinical competence in medical school. Suggestions are made for future studies.

*Interdisciplinaria. 1994; 11: 129-148.*

**ASSOCIATIONS BETWEEN SELECTED PSYCHOSOCIAL ATTRIBUTES  
AND RATINGS OF PHYSICIAN COMPETENCE**

*Mohammadreza Hojat, Karen M. Glaser, J. Jon Veloski*

**Objective:** To investigate the associations between selected psychosocial attributes and ratings of clinical competence of physicians.

**Methods:** Participants were 110 physicians (52% of the total class who graduated from the Jefferson Medical College of Thomas Jefferson University in 1991 [38% women]). They completed the psychosocial questionnaires voluntarily while in medical school and also granted written permission to collect clinical competence ratings from their residency program directors.

**Psychosocial Measures:** Included Taylor Manifest Anxiety Scale, Emotional Instability, Extraversion, Rosenberg Self-Esteem Scale, UCLA Loneliness, Beck Depression Inventory, measures of poor-relationships, and satisfaction with early relationships with mothers and fathers.

**Outcome Measures:** Included physician clinical competence ratings in three areas of clinical competence: data-gathering skills, interpersonal relations and attitudes, and socioeconomic aspects of patient care.

**Results:** Results showed that physicians rated in the top half in any clinical competence area scored significantly lower on the anxiety and emotional instability scales than did their counterparts in the bottom half of the clinical competence measures. Also, top-rated physicians reported better peer relationships than did their bottom-rated counterparts. With regard to the perceptions of early relationships with parents, perceptions of warm relationships with fathers in childhood were not significantly associated with clinical competence ratings, but physicians in the top half of the rating distribution of interpersonal relations and attitudes and socioeconomic aspects of patient care reported warmer relationships with their mothers than did their counterparts in the bottom half of the distributions.

*Academic Medicine. 1996; 71(Supplement): S103-S105.*

### PHYSICIANS' PERCEPTIONS OF THE CHANGING HEALTHCARE SYSTEM: COMPARISONS BY GENDER AND SPECIALTIES

*Mohammadreza Hojat, Joseph S. Gonnella, James B. Erdmann, J. Jon Veloski, Daniel Z. Louis,  
Thomas J. Nasca, Susan L. Rattner*

This study was designed to investigate physicians' perceptions of changes in the United States healthcare system impacting academic medicine, quality of care, patient referrals, cost, and ethical and socio-political aspects of medicine. A survey was mailed in 1998 to 1,272 physicians (graduates of Jefferson Medical College between 1987 and 1992); 835 physicians (66%) responded. Results showed that substantial majority (92%) believed that learning to work in a managed care environment should become an essential component of medical education. Physicians perceived that current changes impair physicians' autonomy (94%) and restrain physician's freedom to provide optimal care (84%). A sizable majority (75%) endorsed patients' freedom to seek specialist care, and 55% believed that capitation reduces physician' motivation for long-term monitoring of patients. The majority endorsed universal health coverage (80%) and agreed to support rather than resist the changes (62%). Only 18% hold a positive view of the changes in the future. The majority believed that medical education should prepare physicians to provide end-of-life care (92%) and that organized medicine should take a stand on social issues that can influence the well-being of society (79%). Only 34% endorsed the legalization of physician-assisted suicide. No gender differences were observed, but a few differences were found between generalists and specialists. Results can help in understanding physicians' perceptions of current changes in the United States.

*Journal of Community Health. 2000; 25(6): 455-471.*

Available online at publisher's site:

<http://www.springerlink.com/link.asp?id=t20230578567513m>

**MEDICAL STUDENT'S COGNITIVE APPRAISAL OF STRESSFUL LIFE EVENTS AS RELATED TO PERSONALITY, PHYSICAL WELL-BEING, AND ACADEMIC PERFORMANCE: A LONGITUDINAL STUDY**

*Mohammadreza Hojat, Joseph S. Gonnella, James B. Erdmann, Wolfgang H. Vogel*

This longitudinal study was designed to test three hypotheses that medical students who can cope better with adversity would: (1) have a more positive personality profile, (2) report less physical illnesses, and (3) perform better academically. Total participants were 2,114 medical students at Jefferson Medical College who completed a set of psychosocial questionnaires and were prospectively followed up during medical school education and beyond. Participants reported on a five-point scale their appraisal of five stressors (death or health deterioration of a family member, personal illness, financial and academic problems). Students who experienced the stressors ( $n = 1446$ , 68% of total participants) were divided into three groups (Resilient, Intermediate, Frail) based on their appraisal of the stressors. The three groups were compared on a set of personality scales (e.g. general anxiety, depression, test anxiety, neuroticism, loneliness, self-esteem, and extraversion), physical well-being factors (e.g. chronic health, eating/drinking/smoking, agitation symptoms, somatic symptoms, and global sickness), academic performance indicators in medical school (e.g. grade point averages, class rank, and medical licensing examinations), and ratings of clinical competence in postgraduate medical training. Hypotheses 1 and 2 were confirmed, and hypothesis 3 was partially confirmed. Implications for developing coping skills, stress management strategies, and student counseling are discussed.

*Personality and Individual Differences. 2003; 35(1): 219-235.*

Available online at publisher's site:

[http://dx.doi.org/10.1016/S0191-8869\(02\)00186-1](http://dx.doi.org/10.1016/S0191-8869(02)00186-1)

### **PSYCHOSOCIAL CHARACTERISTICS OF FEMALE STUDENTS IN THE ALLIED HEALTH AND MEDICAL COLLEGES: PSYCHOMETRICS OF THE MEASURES AND PERSONALITY PROFILES**

*Mohammadreza Hojat, Kevin Lyons*

For the purpose of developing a comprehensive assessment method of predicting academic and professional success among health professions students, a set of 12 psychosocial measures were administered, and their psychometric properties were examined. Participants were 141 female allied health and 71 female medical students. Alpha and test-retest reliabilities and construct and concurrent validities of the measures were studied, and most of the measures were found to have satisfactory psychometric properties. Comparisons were also made between medical and allied health sciences students using the 12 psychosocial measures. Allied health students scored higher on loneliness, anxiety, and depression and scored lower on perception of general health and perception of their fathers as compared to medical students. Implications of the findings for development of prediction models of academic and professional performance are discussed.

*Advances in Health Sciences Education. 1998; 3(2): 119-132.*

Available online at publisher's site:

<http://www.springerlink.com/openurl.asp?genre=article&id=doi:10.1023/a:1009733623166>

**A COMPARISON OF THE PERSONALITY PROFILES OF INTERNAL  
MEDICINE RESIDENTS, PHYSICIAN ROLE MODELS, AND THE  
GENERAL POPULATION**

*Mohammadreza Hojat, Thomas J. Nasca, Mike Magee, Kendra Feeney, Rudolfo Pascual, Frank Urbano, Joseph S. Gonnella*

**Purpose:** To compare personality profiles of internal medicine residents with those of the general population and positive role models in medicine.

**Method:** A widely used personality inventory, NEO PI-R(c), which measures five major personality factors and 30 important personality facets, was administered to 104 physicians in internal medicine residency and to a nationwide sample of 188 physicians selected as positive role models in medicine.

**Results:** The internal medicine residents, compared with the general population, were more likely to be attentive, to have deeper intellectual curiosity, to have higher aspiration levels, to have more vivid imagination, to be more receptive to their emotions, to be interested in mental stimulation, and to think carefully before acting. The residents, compared with role models in medicine, were less eager to face challenges, less able to control their impulses, less able to cope with adversity, less easygoing, and less relaxed, but were more likely to crave excitement.

**Conclusion:** Internal medicine residents and positive role models in medicine have some distinct personal qualities. Understanding the qualities of successful physicians can be helpful in career counseling of medical students and young physicians.

*Academic Medicine. 1999; 74: 54-60.*

### STUDENTS' PSYCHOSOCIAL CHARACTERISTICS AS PREDICTORS OF ACADEMIC PERFORMANCE IN MEDICAL SCHOOL

*Mohammadreza Hojat, Mary R. Robeson, Ivan Damjanov, J. Jon Veloski, Karen Glaser,  
Joseph S. Gonnella*

This study was designed to investigate the incremental effects of selected psychosocial measures—beyond the effects of conventional admission measures—in predicting students' academic performances in medical school. In 1989-90, 210 second-year students at Jefferson Medical College were each asked to complete 11 psychosocial questionnaires that were then used as predictors of performance measures in medical school. The students' scores on three subtests of the Medical College Admission Test (MCAT) were also used as predictors. Three composite measures of performance were used as the criterion measures: basic science examination grades, clinical examination grades, and ratings of clinical competence. A multiple regression algorithm (general linear model) was used for statistical analysis. The response rate was 83% (175 students). When the psychosocial measures were added to the statistical models in which the common variances of the MCAT scores were already determined, significant increments in the common variances were observed for two of the three performance measures: basic science grades and clinical examination grades. Whereas only 4% of the common variance in the ratings of clinical competence could be accounted for by the MCAT scores, 14% could be accounted for by the psychosocial measures.

The 'noncognitive', or psychosocial, measures increased the magnitude of the relationships between the predictive and criterion measures of the students' academic performances beyond the magnitude attained when only the conventional measures should be considered as significant and unique predictors of performance in medical school.

*Academic Medicine. 1993; 68: 635-637.*

**ATTITUDES TOWARD MANAGED CARE: A BRIEF INSTRUMENT TO MEASURE ATTITUDES OF MEDICAL STUDENTS TOWARDS CHANGE IN THE HEALTHCARE SYSTEM**

*Mohammadreza Hojat, J. Jon Veloski, Joseph S. Gonnella, James B. Erdmann, Susan L. Rattner*

**Background:** Efforts are being made to prepare medical students, residents, practicing physicians, and medical educators to face new challenges in the evolving healthcare systems. In this critical period of development, it is timely and important to understand the attitudes of medical students toward the changes and their perceived impacts. This study was designed to develop a research instrument to measure medical students' attitudes toward changes in the United States healthcare system.

**Methods:** Based on literature review, a preliminary draft of a questionnaire (40-item) was developed. After a pilot study the questionnaire was modified and a new version was administered to 394 medical school seniors in 1997 and 1998.

**Results:** Correlational analyses including factor analysis resulted in a brief attitude scale (8-item) with satisfactory psychometric properties. Data support the face validity, construct validity, criterion-related validity, and alpha reliability of the scale.

**Conclusions:** This psychometrically sound research instrument can be used in the assessment of educational programs to improve medical students' attitudes toward changes in the healthcare system. Further research is needed to expand this research tool for assessing physicians' attitudes toward different aspects of changes in the United States healthcare system.

*Academic Medicine. 1999; 74(October Supplement): S78-S80.*

### PERCEPTIONS OF MEDICAL SCHOOL SENIORS OF THE CURRENT CHANGES IN THE U.S. HEALTHCARE SYSTEM

*Mohammadreza Hojat, J. Jon Veloski, Daniel Z. Louis, Gang Xu, David Ibarra, Jonathan E. Gottlieb,  
James B. Erdmann*

Perceptions of medical school seniors about changes occurring in the healthcare environment were investigated. A survey was completed by 196 Jefferson Medical College seniors in the class of 1997. Of the respondents, 79% believed that cost reduction rather than quality of care is the primary consideration behind recent changes, 78% felt that managed care organizations hamper physicians' abilities to render optimal care, 83% maintained that the control of health care by insurance companies would lead to lower quality of care, 69% agreed that patients should have the freedom to seek a specialists' care without being referred by a primary care physician, 82% recommended that mentally ill patients should be referred to a mental health professional, and 82% believed that learning to work in a managed care environment should be an essential component of medical education. Assessment of student perceptions can assist in the development and implementation of appropriate curricular changes.

*Evaluation & The Health Professions. 1999; 22(2): 169-183.*

Available online at publisher's site:

<http://ehp.sagepub.com/cgi/content/abstract/22/2/169>

**EFFECTS OF ACADEMIC AND PSYCHOSOCIAL PREDICTORS OF PERFORMANCE IN MEDICAL SCHOOL ON COEFFICIENTS OF DETERMINATION**

*Mohammadreza Hojat, Wolfgang H. Vogel, Carter Zeleznik, Bette D. Borenstein*

This study was designed to answer the following questions: (1) Does a set of selected noncognitive variables predict medical school performance measures? and (2) Is there a significant increase in the coefficients of determination when noncognitive measures are added to the conventional cognitive predictors in regression models? Complete data on all measures were available for 88 sophomore medical students. Cognitive (academic) predictors were undergraduate GPA in science and nonscience courses and scores on science problems, reading, and quantitative scales of the Medical College Admission Test. Noncognitive (psychological) predictors were scores on scales of stressful life events, general anxiety, test anxiety, emotionality, external locus of control, intensity and chronicity of loneliness, sociability, self-esteem, perception of early relationships with mother, father and peers, and indices of over- and under-confidence. Criterion measures were freshman and sophomore GPAs in medical school and scores on Part I of the National Board examinations. Results indicate that (1) noncognitive predictors could significantly predict criterion measures and (2) inclusion of noncognitive measures in a model of cognitive predictors could substantially increase the magnitude of the relationships.

*Psychological Reports. 1988; 63: 383-394.*

### HOW MUCH DO MEDICAL STUDENTS KNOW ABOUT PHYSICIAN INCOME?

*Sean Nicholson*

Twenty-five cohorts of medical students were asked in their first and fourth year of school to estimate contemporaneous physician income in six different specialties. The students' income estimation errors varied systematically over time and cross-sectionally by specialty and type of student. The median student underestimated physician income by 15 percent, and the median absolute value of the estimation errors was 26 percent of actual income. Students were 35 percent more accurate when estimating market income in their fourth relative to their first year, which indicates medical students learn a considerable amount before choosing a specialty.

*The Journal of Human Resources. 2005; 40(1): 100-114.*

**CORRELATES OF PHYSICIANS' ENDORSEMENT OF THE LEGALIZATION OF PHYSICIAN-ASSISTED SUICIDE**

*Karen Novielli, Mohammadreza Hojat, Thomas J. Nasca, James B. Erdmann, J. Jon Veloski*

**Problem Statement and Background:** Empirical studies on end-of-life care and the factors associated with legalization of physician-assisted suicide (PAS) are scarce. Our purpose was to examine the extent and correlates of physicians' endorsement of legalization of PAS.

**Method:** A survey was mailed in 1998 to 1,272 physicians (Jefferson Medical College graduates from 1987-1992). 835 responded (66%), and 830 were useable for this study.

**Results:** Of the respondents, 284 (34%) endorsed, 340 (41%) did not endorse, and 206 (25%) expressed no opinion about legalization of PAS. Hospital-based physicians were more likely to endorse legalization of PAS than primary care physicians. Endorsement of legalization of PAS was correlated with views about other issues in medicine and the healthcare system.

**Conclusions:** More empirical research is needed to understand the political, moral and ethical context that frame physicians' views on PAS and to examine the impact of medical education on attitudes towards PAS.

*Academic Medicine. 2000; 75(October Supplement): S53-S55.*

Available online at publisher's site:

<http://www.academicmedicine.org/pt/re/acmed/pdfhandler.00001888-200010001-00017.pdf>

### **INTRA- AND INTER-CULTURE COMPARISONS OF PERSONALITY PROFILES OF MEDICAL STUDENTS IN ARGENTINA AND THE UNITED STATES**

*Horacio J. A. Rimoldi, Roberto Raimondo, James B. Erdmann, Mohammadreza Hojat*

This study was designed to compare the personality profiles of medical students in Argentina and the United States. The ultimate purpose of the research was to study the value of personality measures in predicting academic and professional performances. Participants were 421 medical students in Argentina (254 women, 167 men) and 623 medical students in the United States (207 women, 416 men). Eight personality measures were administered: Perception of Stressful Life Events, Test Anxiety, General Anxiety, Loneliness, Self-Esteem, Locus of Control, Extraversion, and Neuroticism. Intracultural comparisons showed some minor gender differences in personality profiles within each culture (e.g., in the United States, women scored higher than men on the Perception of Stressful Life Events and General Anxiety scales, and in Argentina women scored higher on the Test Anxiety scale). Intercultural comparisons of personality profiles showed that Argentine medical students obtained higher average scores than their American counterparts on Perception of Stressful Life Events, Test Anxiety, General Anxiety, External Locus of Control, Extraversion, and Neuroticism scales. Argentine students scored lower on the Loneliness scale than their American counterparts. Psychometric findings supported the measurement properties of the personality measures in the two cultures (e.g., construct validity, and internal consistency aspect of reliability). Further study of the implications of the findings in predicting academic attainment in medical school and to physician performance is recommended.

*Adolescence. 2002; 37: 477-494.*

**INCOME EXPECTATIONS OF FIRST-YEAR STUDENTS AT JEFFERSON  
MEDICAL COLLEGE AS A PREDICTOR OF FAMILY PRACTICE  
SPECIALTY CHOICE**

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The recent decline in the number of medical students choosing careers in the primary care specialties has engendered increasing concern that economic factors are becoming more important in influencing the career choices of medical students. In order to assess the relationship of first-year medical students' income expectations to whether they chose to specialize in family practice, the authors analyzed data from 532 graduates of Jefferson Medical College (classes of 1987-1989), using the Jefferson Longitudinal Study. At entrance to medical school, each student listed his or her initial specialty preference and future expected peak income; the determination of actual specialty choice was based on the first year of postgraduate training. Both expected peak incomes and freshman specialty choices were independent predictors of actual specialty choices. The students who entered family practice residencies had lower initial expected peak incomes than did the students entering other specialties, especially the surgery specialties. In addition, according to logistic regression analysis, the students with relatively lower income expectations and a freshman preference for family practice were predicted to be nine times more likely to enter family practice residencies than were students with higher income expectations and no initial family practice preference (56% versus 6%). This study suggests that a freshman's income expectation is an important predictor of family practice specialty choice, independent of age, sex, degree of indebtedness, and initial specialty preference. The authors discuss their results in light of the decline in the number of medical students choosing family practice and the other primary care specialties.

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### MINDFULNESS-BASED STRESS REDUCTION LOWERS PSYCHOLOGICAL DISTRESS IN MEDICAL STUDENTS

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**Background:** Medical students confront significant academic, psychosocial, and existential stressors throughout their training. Mindfulness-based stress reduction (MBSR) is an educational intervention designed to improve coping skills and reduce emotional distress.

**Purpose:** The purpose of this study was to examine the effectiveness of the MBSR intervention in a prospective, nonrandomized, cohort-controlled study.

**Methods:** Second-year students ( $n = 140$ ) elected to participate in a 10-week MBSR seminar. Controls ( $n = 162$ ) participated in a didactic seminar on complementary medicine. Profile of Mood States (POMS) was administered preintervention and postintervention.

**Results:** Baseline total mood disturbance (TMD) was greater in the MBSR group compared with controls ( $38.7 \pm 33.3$  vs.  $28.0 \pm 31.2$ ;  $p < .01$ ). Despite this initial difference, the MBSR group scored significantly lower in TMD at the completion of the intervention period ( $31.8 \pm 33.8$  vs.  $38.6 \pm 32.8$ ;  $p < .05$ ). Significant effects were also observed on Tension-Anxiety, Confusion-Bewilderment, Fatigue-Inertia, and Vigor-Activity subscales.

**Conclusion:** MBSR may be an effective stress management intervention for medical students.

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**THE INCOME EXPECTATIONS OF MEDICAL STUDENTS IN THE TIME  
PERIOD 1970 TO 1980**

*J. Jon Veloski, Carter Zeleznik, Mohammadreza Hojat*

This study reports students' expectations of income over the past decade and analyzes the effects of factors related to these income expectations. Data collected by means of questionnaires administered to seniors at one medical school approximately three months prior to commencement were analyzed. The questionnaires included items dealing with the students' plans for specialty training, the number of hours per week expected to work and the type of career planned after completion of training. The results show that graduating medical students are knowledgeable about income differentials among specialties. Women reported lower peak income expectations in each of the specialties considered, and the graduates who plan clinical careers expect higher incomes than those planning academic careers. Presently there is concern that reduced government support for education will result in student debt level changes or changes in the demographic characteristics of medical students. A long range implication of these findings is that they provide essential baseline data needed to monitor the effects of major changes in the financing of medical education.

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**STUDENTS' CERTAINTY DURING COURSE TEST-TAKING AND  
PERFORMANCE ON CLERKSHIPS AND BOARD EXAMS**

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Psychometric aspects of multiple-choice tests were investigated using a confidence-weighted scoring technique. The contributions of two indices, overconfidence and under-confidence, in the prediction of subsequent academic performance of examinees were studied. A total of 444 sophomore students (entering classes of 1982 and 1983) in one medical school were asked to indicate their confidence, on a 5-point scale (100, 75, 50, 25, and 0), in the correctness of their responses to each multiple-choice item on a Introduction to Clinical Medicine examination. Examinations were scored in two ways: in the conventional way, using the total number of correct responses, and by a confidence-weighted technique based on the level of certainty indicated for each response by the examinee. Only the conventional score determined the grade; the confidence-weighted score was calculated for the purely experimental purposes of this study. Overconfidence and under-confidence indices were also calculated by using the indicated levels of certainty. Improvements in the psychometrics of the examinations were observed when confidence-weighted scores and indices of over- and under-confidence contributed significantly to predicting scores of the students on Parts I and II of the National Board of Medical Examiners examination, whereas the conventional score did not contribute to the prediction of Part II scores. Significant differences on junior clerkship examinations and ratings were observed between those who were highly overconfident and those who were slightly overconfident. The highly overconfident students also estimated higher future incomes than did those who were slightly overconfident.

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