Perfectionism, the impostor phenomenon and psychological adjustment in medical, dental, nursing and pharmacy students

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SUMMARY

Extensive attention has been paid over the past three decades to the stressors involved in training in the health professions. Although empirical studies have identified demographic subgroups of students most likely to become distressed during training, less research has been carried out to evaluate the impact of students' personality characteristics on their adjustment. Severe perfectionism is one such personality trait that has been shown to increase the risk for anxiety and depressive disorders in other populations. Another set of personality traits linked to increased psychological problems has been labelled the 'impostor phenomenon', which occurs when high achieving individuals chronically question their abilities and fear that others will discover them to be intellectual frauds. Both perfectionism and the impostor phenomenon would seem to be pertinent factors in the adjustment of health professional students; however, these character traits have not been empirically examined in this population. In the present study psychological distress, perfectionism and impostor feelings were assessed in 477 medical, dental, nursing and pharmacy students. Consistent with previous reports, the results showed that a higher than expected percentage of students (27·5%) were currently experiencing psychiatric levels of distress. Strong associations were found between current psychological distress, perfectionism and impostor feelings within each programme and these character traits were stronger predictors of psychological adjustment than most of the demographic variables associated previously with distress in health professional students. Implications for future research, limitations of this study and clinical recommendations are discussed.

INTRODUCTION

Training for a career in medicine and the other health professions (i.e. dental, nursing, pharmacy) is associated with significant stressors such as time pressure, rote memorization of large amounts of information, frequent evaluation, financial problems, limited time for recreation and relationships, peer competitiveness and increased responsibilities related to patient care (Vitaliano *et al.* 1984). It is not surprising, therefore, that students in the health professions report higher levels of depression and anxiety than might be expected given their demographic make-up and that many of these students experience clinical levels of distress (e.g. Lloyd & Musser 1989; Hendrie *et al.* 1990; Parkerson *et al.* 1990; Wolf 1994). Given the potentially negative consequences of high levels of psychological distress in health professional students (i.e. reduced physical health, decreased academic performance, future professional impairment), it seems important to identify those students who are at greatest risk for psychological maladjustment during their training (e.g. Wolf 1994).

Previous studies have identified a number of demographic factors that may influence students' psychological adjustment during medical training, including students' gender, marital status, race, prior mental health history and academic year (e.g. Coombs & Fawzy 1982; Zoccolillo *et al.* 1986; Hendrie *et al.* 1990; Parkerson *et al.* 1990). However, because most of the empirical research addressing this issue focuses on medical students specifically, it remains unclear whether these students are at greater risk for psychological problems than students of other health professions, and whether these demographic risk factors apply to students from all the health professions. One study

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that did compare medical and dental students suggested that both groups are at equal risk for psychological maladjustment (Lloyd & Muser 1989). No reports are available, however, comparing medical and dental students with nursing and pharmacy students.

The available literature on psychological distress in health professions students has also largely ignored the influence of personality traits that might predispose some students to greater psychological maladjustment during training. One personality trait that may play a particularly important role in students' adjustment to training in the health professions is perfectionism. Recent studies with other populations have demonstrated a strong association between perfectionism and increased risk for depression, anxiety, obsessive–compulsive symptoms and suicide (e.g. Blatt 1995). Clearly, the admission requirements for medical school and the other health profession programmes favour students who set very high standards for themselves, and once accepted into such programmes students must continue to meet the high standards others set for them. In extreme cases, however, a student's effort to fulfil such high expectations may place him or her at risk for significant psychological distress.

Another set of character traits that may play a role in the psychological adjustment of health professional students has been labelled the impostor phenomenon (IP). The IP was first documented by Clance & Imes (1978), who observed that high achieving individuals often believe they are less intelligent and less competent than others perceive them to be. These people attribute their success to factors unrelated to their intelligence (e.g. luck, charm) and live with a constant fear that they will eventually be discovered as frauds. Subsequent research with a general population of undergraduate students found that the IP is associated with high levels of depression and anxiety (Chrisman et al. 1995). To date, no published reports have documented the prevalence of the IP in students from the health professions. It seems likely, however, that this phenomenon occurs at a high rate in this population. Students in their first year of a demanding medical curriculum often wonder if they were admitted to the programme by 'accident', and in their latter years of training many health professions students question their ability to act as a member of a medical team and carry out professional activities with patients. These impostor feelings may in turn lead to more serious psychological problems for some students.

The goals for the present study, therefore, were to examine the severity of perfectionism and the IP in health profession students, and to assess the relationship between these personality traits and students'

psychological adjustment. Furthermore, we were interested in comparing students from medicine, dentistry, nursing and pharmacy to determine whether students in some programmes are at higher risk for psychological maladjustment than others. Finally, we also sought to identify demographic variables that were associated with students' psychological adjustment and determine whether these were the same or different across academic programmes.

METHOD

Subjects

Of the ≈ 1090 students enrolled in the classes surveyed, a total of 988 received the questionnaire yielding a 91% distribution rate. Of these 988 questionnaires, 477 were returned for a total response rate of 48%. This response rate was lower than expected, and it is unclear if the students who participated differed on psychological and personality measures from those students who declined to participate.

Four-hundred and seventy-seven students (47% men) from the Medical University of South Carolina (MUSC) participated in this study. The mean age of the sample was 26·2 years (SD = 5), and ranged from 20 to 54 years. Forty-six per cent of the students (n = 221) were in medicine, 21% (n = 102) were in dentistry, 17% (n = 82) were in nursing and 15% (n = 72) were in pharmacy. Students in the pharmacy programme were completing their BS degree, whereas the nursing sample was comprised of students in either a BSN programme or a RN re-certification programme. The dental and medical students were enrolled in 4-year degree programmes. Family of origin socio-economic status (SES) for the sample was quite high, with a mean Hollingshead's SES (1975, unpublished manuscript) of 4·13 (SD = 0·85; range = 1–5, with 5 = 'professional level'). Most of the subjects were never married (63%) and Caucasian (85%). African Americans made up the largest minority group at 8·3%, with Asians comprising the next largest group (4·4%). These demographic data are similar to the data from the university as a whole, where 85% of the students are Caucasian and the median age of the student body is 28 years.

Procedures

Subjects for this study were recruited from regularly scheduled classes in the colleges of nursing, medicine, dentistry and pharmacy at MUSC during the Spring semester of 1996. The anonymous questionnaire and lay summary form were distributed to students at the

beginning of their class and a brief verbal description of the research was provided by one of the principal investigators. Students returned the completed questionnaire immediately after class or through the campus mail system. A lottery with four $75 prizes was used to provide an additional incentive for participating in the study.

Measures

The individual scales used in the present study were presented together in a single questionnaire. Three different versions of the questionnaire were created so that the order of the scales could be counterbalanced. The measures used were as follows.

Current psychological adjustment

The Brief Symptom Inventory (BSI), developed by Derogatis & Spencer (1982), was used to measure general psychological adjustment. The BSI assesses the severity of 53 psychological symptoms over the past week. Respondents rate the severity of distress experienced for each symptom on a 5-point scale ranging from 0 ('not at all') to 4 ('extremely'). This measure has been used widely with both clinical and non-clinical populations and is reported to have excellent psychometric properties (Derogatis & Melisaratos 1983; Boulet & Boss 1991). In the present study, only the gender-normed T-scores for the Global Severity Index (GSI-T) were used in the data analyses. The GSI-T is one of three summary scores available with the BSI. It combines information on both the number of symptoms endorsed and the intensity of distress associated with each symptom.

Perfectionism

The Multidimensional Perfectionism Scale (MPS; Hewitt & Flett 1989, 1991) was used to assess the character trait of perfectionism. The MPS is a 45-item scale that asks respondents to rate each question using a 7-point Likert scale. The measure yields three 15-item subscales reflecting different types of perfectionism. *Self-oriented perfectionism* is defined as attempts to be perfect in one's work and to regularly criticize one's performance (e.g. 'one of my goals is to be perfect in everything I do'). *Other-oriented perfectionism* relates to expecting a great deal of others (e.g. 'if I ask someone to do something I expect it to be done flawlessly') and *socially prescribed perfectionism* involves the perception that others expect a great deal of you and will criticize any signs of failure (e.g. 'my family expects me to be perfect'). The items for the MPS were selected to be independent of social desirability, and these sub-

scales have excellent internal consistency (Cronbach's α = 0·86, 0·82 and 0·87, respectively) and strong reliability over time (0·88, 0·85 and 0·75). Factor analyses have verified the three subscales and there appears to be substantial concurrent validity for these scales (Hewitt & Flett 1991).

The impostor phenomenon

Characteristics of the IP were assessed using Clance's Impostor Phenomenon Scale (CIPS; Clance 1985). The CIPS is comprised of 20 items that subjects rate on a 5-point scale of agreement. This results in a total score ranging from 20 to 100 that reflects the overall severity of the IP. Sample items include: 'I'm afraid people important to me may find out that I'm not as capable as they think I am', 'when I've succeeded at something and received recognition for my accomplishments, I have doubts that I can keep repeating that success' and 'I often compare my ability to those around me and think they may be more intelligent than I am'. The measure has a high degree of internal consistency (Cronbach's α = 0·92–0·96) and strong validity findings have been reported (Holmes *et al.* 1993; Chrisman *et al.* 1995).

RESULTS

On the MPS perfectionism scale, the health professions students as a whole rated themselves as being highest in self-oriented perfectionism (M = 68·57, SD = 15·70), then other-oriented perfectionism (M = 57·63, SD = 12·28) and lowest on socially prescribed perfectionism (M = 48·85, SD = 13·81). Contrary to our expectations, the health professions students in the present sample did not report significantly more perfectionism than has been observed in other student samples. For example, Hewitt & Flett's (1991) survey of 1106 university students (presumably undergraduate students) yielded means and standard deviations for the three subscales as follows: self-oriented, M = 68, SD = 14·95; other-oriented, M = 57·94, SD = 11·74; and socially prescribed, M = 53·62, SD = 13·85. *T*-tests comparing Hewitt & Flett's scores with those of the health professions students in the present sample suggested that the latter reported significantly less socially prescribed perfectionism, $t(1568) = 6·23$, $P < 0·01$. No differences were observed on the other two subscales.

Although no normative data are currently available in the literature for the CIPS impostor scale (Clance 1985), a rough clinical cut-off has been established using a small sample of undergraduates and

psychotherapy patients (Holmes *et al.* 1993). Using this cut-off (total ≥ 62) in the present study resulted in 30·2% of the students being in the clinical range for the IP. Significantly more women than men scored above the cut-off (37·8% vs. 22%), χ^2 (1, $n = 464$) = 13·62, $P < 0.001$, and the mean total score for women (M = 57·83, SD = 14·89) was also significantly higher than that observed with men (M = 52·08, SD = 13·03), $F(1, 463)$ = 19·42, $P < 0.001$. These results suggest that a high percentage of students in the health professions report impostor feelings, and that this is particularly true for women.

Demographic comparisons between the students from the four different programmes (i.e. medicine, dentistry, pharmacy, nursing) revealed four significant differences (see Table 1). First, a higher percentage of the students in pharmacy and nursing were women (77·8% and 78%, respectively) compared with 47% for medicine and 26·7% for dentistry, χ^2 (3, $n = 474$) = 69·5, $P < 0.001$. Secondly, nursing students were older on average (M = 29·3) than the medical (M = 25·9), dental (M = 25·5) and pharmacy students (M = 24·6), $F(3, 473)$ = 12·8, $P < 0.001$. Thirdly, a higher proportion of students in nursing were married (51·2%) compared with medical (29·1%), dental (33%) and pharmacy students (28·2%), χ^2 (3, $n = 473$) = 14·4, $P < 0.01$. Finally,

students in nursing and pharmacy were more likely to have had mental health treatment prior to starting in their current programme (24·4% and 22·2%, respectively) than medical (11·8%) and dental students (7·8%), χ^2 (3, $n = 477$) = 14·8, $P < 0.01$.

Table 1 also provides the descriptive data for the three MPS perfectionism scales and the CIPS impostor scale as a function of academic programme. A MANCOVA analysis was used to compare these four personality scales across the academic programmes. The four demographic variables that differed between the four programmes were entered as covariates. The Wilk's criterion revealed that the combined dependent variable varied reliably as a function of academic programme, approximately $F(12, 1217)$ = 2·05, $P < 0.05$. In the univariate context only one of the scales, socially prescribed perfectionism, yielded a significant difference. A Student–Newman–Keuls analysis (SNK; $P < 0.05$) showed that pharmacy students reported more socially prescribed perfectionism than the students in the other three programmes who did not differ reliably from one another.

As a group, the students in this sample reported moderately high levels of psychological distress on the Brief Symptom Inventory (BSI), with the mean Global Severity Index T-score (GSI-T; M = 56·4, SD = 10·4) being 6·4 points above the mean for the

Table 1 Demographic variables, personality traits (self-oriented perfectionism, other-oriented perfectionism, socially prescribed perfectionism and the impostor phenomenon), and psychological adjustment (Brief Symptom Inventory GSI-T) across colleges

	Medicine ($n = 221$) %		Dental ($n = 102$) %		Nursing ($n = 82$) %		Pharmacy ($n = 72$) %	
Demographic								
Sex (female)[a]	47·0		26·7		78·1		77·8	
Race (minority)	18·4		13·7		7·4		18·3	
Married[a]	29·1		33·0		51·2		28·2	
Prior ment. health Tx[a]	11·8		7·8		24·4		22·2	
	M	SD	M	SD	M	SD	M	SD
Age (years)	25·9[z]	3·7	25·5[z]	4·2	29·3[y]	7·3	24·6[z]	4·2
Personality[b]								
CIPS	54·7[z]	14·2	52·0[z]	12·4	56·4[z]	14·8	59·4[z]	15·0
MPS self-oriented	67·1[z]	15·1	71·1[z]	14·3	66·5[z]	16·5	72·1[z]	16·2
MPS other-oriented	56·5[z]	12·8	60·3[z]	12·0	56·6[z]	10·7	59·6[z]	10·7
MPS socially presc.	47·2[z]	13·3	50·2[zy]	12·9	47·2[z]	14·1	53·7[y]	14·3
Adjustment[b]								
GSI-T score	54·7[z]	10·2	56·9[z]	10·2	54·5[z]	10·3	62·3[y]	8·8

[a] Proportion within each college varied reliably in overall χ^2 analysis ($P < 0.01$). [b] Analyses controlled for demographic differences across colleges. Row means with same superscript not significantly different across colleges (SNK, $P < 0.05$).

normative sample. Using the criteria established by Derogatis & Spencer (1982) for determining clinically relevant levels of psychological distress on the BSI (i.e. GSI T-score ≥ 63), we found that 27·5% of the students were in the clinical range. This is over 2·5 times the number that might have been expected given the normative data. The high percentage of students in this sample reporting clinical levels of psychological distress was also demonstrated by comparing them with students seen for an intake interview during the 1995–96 academic year at the counselling centre associated with the same university ($n = 144$). Twenty-one per cent of the survey respondents scored at or above the mean GSI T-score obtained by students seeking clinical services (M = 65·6, SD = 9·5).

Lastly, Table 1 provides the means and standard deviations for the GSI-T across the four academic programs. An ANCOVA, with gender, marital status, prior mental health treatment and age entered as the covariates, revealed a significant difference in current psychological distress as a function of academic programme, $F(3, 455) = 10·8$, $P < 0·001$. Examination of the means (Student–Newman–Keuls; $P < 0·05$) showed that pharmacy students were more distressed than dental, medical and nursing students who did not differ from one another. A higher percentage of pharmacy students were also in the clinical range on the BSI (50·1%) than dental (29·7%), medical (21·1%) and nursing students (21·3%), $\chi^2 (3, n = 465) = 25·3$, $P < 0·001$.

In the next set of analyses, correlations (Pearson and point-biserial) and simultaneous multiple regression analyses were used to evaluate demographic variables, perfectionism (i.e. self, other, socially prescribed), and the IP as predictors of students' current psychological distress (i.e. GSI-T). Separate analyses were conducted for each programme in order to determine whether there were differences in the factors that accounted for the students' distress. The six demographic variables analysed were age of the respondent, gender, academic year, receipt of mental health treatment at any time prior to starting school at MUSC (no = 0, yes = 1), race (Caucasian = 0, minority = 1) and marital status (never married/divorced = 0, married/long-term partner = 1). Table 2 provides the results of these analyses.

Three demographic variables and all the personality characteristics were significantly correlated with medical students' GSI-T scores. First, minority medical students reported lower distress than Caucasian medical students ($r_{pb} = -0·14$, $P < 0·05$). Secondly, there was an negative correlation between the GSI-T and academic year ($r = -0·18$, $P < 0·01$), suggesting that medical students may be at greater risk for psycholog-

ical distress earlier in their training. Thirdly, married medical students reported less distress than unmarried medical students ($r_{pb} = -0·15$, $P < 0·05$). Medical students reporting high levels of self-oriented perfectionism and other-oriented perfectionism were also more distressed ($r = 0·25$ and 0·23, respectively, $P < 0·001$). The strongest predictors of medical students' distress, however, were socially prescribed perfectionism ($r = 0·38$, $P < 0·001$) and the CIPS impostor scale ($r = 0·55$, $P < 0·001$). These seven predictor variables were then entered into a simultaneous multiple regression analysis to evaluate the unique contribution each made to the prediction of psychological distress (variables not reliably correlated with the GSI-T were excluded from the regressions in order to maintain an acceptable ratio of cases to the IV). The overall regression model was significant, $F(7, 203) = 19·13$, $P < 0·001$, with the combined variables explaining 40% of the variance in medical students' psychological adjustment as measured by the GSI-T. The CIPS impostor scale accounted for the largest proportion of unique variance ($sr^2 = 0·13$, $P < 0·001$), followed by academic year ($sr^2 = 0·03$, $P < 0·001$), socially prescribed perfectionism ($sr^2 = 0·02$, $P < 0·05$), race ($sr^2 = 0·01$, $P < 0·05$) and marital status ($sr^2 = 0·01$, $P < 0·05$).

With dental students, only four of the predictor variables were reliably correlated with the GSI-T. The correlation coefficients between the GSI-T and age ($r = -0·27$, $P < 0·01$) and academic year ($r = -0·23$, $P < 0·05$) suggested that younger students and students in the earlier years of their training were more distressed. As was the case with medical students, the CIPS impostor scale and socially prescribed perfectionism were highly correlated with the GSI-T ($r = 0·49$ and 0·38, respectively, $P < 0·001$). In contrast to the medical students, however, the other two MPS perfectionism subscales (other and self) were not reliably correlated with the GSI-T. In the regression analysis the overall model was significant, $F(4, 96) = 13·2$, $P < 0·001$, with the four predictor variables accounting for 36% of the variance in dental students' psychological distress on the GSI-T. Three of the four variables accounted for unique variance in the GSI-T (sr^2). The CIPS impostor scale explained 15% of the variance ($P < 0·001$), academic year accounted for 5% ($P < 0·05$) and age accounted for 6% ($P < 0·05$).

Pearson and point-biserial correlations for nursing students showed that four variables were related to psychological distress. Male nursing students reported significantly more psychological distress ($r_{pb} = -0·33$, $P < 0·01$), and students reporting higher levels of

Table 2 Correlations and simultaneous multiple regression analyses predicting psychological distress (GSI-T)

	Medical GSI-T			Dental GSI-T			Nursing GSI-T			Pharmacy GSI-T		
	r	β	sr^2	r	β	sr^2	r	β	sr^2	r	β	sr^2
Age	-0·08	–	–	-0·27**	-0·20*	0·06	0·11	–	–	0·03	–	–
Sex (female)	-0·06	–	–	0·02	–	–	-0·33**	-0·28***	0·08	-0·19	–	–
Race (minority)	-0·14*	-0·12*	0·01	0·02	–	–	-0·06	–	–	0·05	–	–
Academic year (1–4)	-0·18**	-0·19***	0·03	-0·23*	-0·19*	0·05	0·12	–	–	-0·03	–	–
Married (yes)	-0·15*	-0·12*	0·01	-0·10	–	–	0·06	–	–	0·13	–	–
Previous mental health Tx	0·12	–	–	-0·03	–	–	0·20	–	–	0·13	–	–
CIPS	0·55***	0·43***	0·13	0·49***	0·39***	0·15	0·62***	0·51***	0·17	0·58***	0·48***	0·15
MPS self-oriented	0·25***	-0·01	0·00	0·12	–	–	0·25*	-0·07	0·00	0·19	–	–
MPS other-oriented	0·23***	0·10	0·01	0·05	–	–	0·03	–	–	0·15	–	–
MPS socially prescribed	0·38***	0·17*	0·02	0·38***	0·18	0·03	0·51***	0·21*	0·03	0·46***	0·19	0·02
	$R^2 = 0·40***$			$R^2 = 0·36***$			$R^2 = 0·50***$			$R^2 = 0·36***$		
	Adj $R^2 = 0·38$			Adj $R^2 = 0·33$			Adj $R^2 = 0·47$			Adj $R^2 = 0·35$		

*$P < 0·05$; **$P < 0·01$; ***$P < 0·001$. Variables not reliably correlated with GSI-T were excluded from regression analyses. All dichotomous variables were correlated with GSI-T using a point-biserial correlation.

self-oriented perfectionism and socially prescribed perfectionism were also more distressed ($r = 0.25$, $P < 0.05$ and $r = 0.51$, $P < 0.001$, respectively). Finally, the CIPS impostor scale was highly related to nursing students' self-reported distress ($r = 0.62$, $P < 0.001$). In the regression analysis these variables accounted for 50% of the variance in the GSI-T, $F(4, 75) = 18.73$, $P < 0.001$. Three of the four predictors accounted for a significant proportion of unique variance, including the CIPS impostor scale ($sr^2 = 0.17$, $P < 0.001$), gender ($sr^2 = 0.08$, $P < 0.001$) and socially prescribed perfectionism ($sr^2 = 0.03$, $P < 0.05$).

With the pharmacy students none of the demographic variables examined were reliably correlated with psychological distress. However, there was some consistency with the findings from the other three groups of students regarding personality traits; the MPS socially prescribed perfectionism subscale and the CIPS impostor scale were significantly related to the GSI-T ($r = 0.58$ and 0.46, $P < 0.001$, respectively). In the regression analysis these two variables accounted for 36% of the variance in the GSI-T, $F(2, 68) = 19.44$, $P < 0.001$. Only the CIPS scale accounted for unique variance, however, explaining 15% ($P < 0.001$).

DISCUSSION

Consistent with previous research on students in the health professions, the present results suggest that medical, dental, nursing and pharmacy students are at high risk for clinical levels of psychological distress. Over 27% of the students sampled were currently experiencing psychological distress that is of clinical significance, and 21% reported equal or greater distress than the average student seeking mental health services at the university's counselling centre. Surprisingly, pharmacy students in the present sample were at greatest risk for psychological distress, with half the students reporting distress levels similar to those reported by psychiatric populations. Unfortunately, no other published studies could be found that evaluate psychological distress in pharmacy students. Therefore, it is impossible to know whether this finding says more about pharmacy students in general or the pharmacy programme at this specific university (i.e. MUSC). Further study of this group of students is needed to determine if pharmacy students elsewhere are similarly distressed and whether endogenous or exogenous factors might be contributing to this pattern.

Another surprising finding from the present study relates to gender differences in psychological adjustment. Previous research with medical and dental students has suggested that women are at greatest risk for psychological problems during professional training (e.g. Lloyd & Musser 1989; Hendrie *et al.* 1990; Parkerson *et al.* 1990). This result was not replicated in our analyses comparing the current psychological distress of men and women in medicine, dentistry and pharmacy; among these three groups of students there was no association between gender and psychological adjustment. However, male nursing students reported more distress than their female counterparts. One possible explanation for this lack of a gender difference in dental and medical students may be the higher number of women entering these programmes nationwide (Niessen 1992; Abeshaus *et al.* 1993) and the larger number of women faculty role models now available to female students (e.g. Bickel & Quinnie 1992). Negative stereotypes about women in medicine and dentistry, previously implicated as factors in the increased distress of female students (e.g. Clark & Rieker 1986), may also be decreasing due to the greater representation of women in these fields. These factors, which may be on the decline for women in dentistry and medicine, may continue to exist for male nursing students who are entering a field historically dominated by women. Greater attention to this population of students may be required, therefore, and support programmes to help men in nursing school should be considered if this finding is replicated in other samples.

Another interesting finding from the present study concerns the negligible effect of race, age, marital status and prior mental health history on students' psychological adjustment. When race was associated with adjustment, it was solely with medical students and the relationship was in the opposite direction than expected: minority medical students reported less psychological distress than Caucasian medical students. As may be the case with women in dentistry and medicine, perhaps the increasing representation of minorities in these programmes along with the outreach programmes that have been established at many schools have begun to have a positive effect on the adjustment of minorities in health-related programmes. Age in this study was related solely to dental students' distress, with younger students reporting more psychological problems. Similarly, for both medical and dental students, the earlier years of training appeared to be associated with greater psychological distress (no curvilinear relationships were observed). Finally, as has been reported elsewhere (Coombs & Fawzy 1982), being married may act as a buffer against psychological distress during professional training. In the present study, however, this was only

true for medical students and the correlation between these two variables was quite small.

Perhaps the most remarkable findings from the present study was the relationship of perfectionism and the IP to psychological distress. Although the health professions students we sampled did not report more perfectionism than other student samples, as we had expected, we still found that the students who were very perfectionistic were at significantly greater risk for psychological distress. In particular, students who were chronically worried about meeting others' expectations of them reported more psychological symptoms, and this was true for students from each of the four programmes. The number of health professions students expressing strong concerns about being discovered as an impostor was also quite high. Furthermore, the severity of these impostor concerns served as a better predictor of students' current psychological distress than all of the other demographic and personality characteristics examined.

Possible questions to address in future research include: (a) how academic institutions may exacerbate or counter students' perfectionistic attitudes and impostor feelings; (b) what role these personality factors play in student dropout rates, substance abuse, willingness to seek psychological treatment and suicide; and (c) whether perfectionistic and impostor attitudes persist beyond training and what role these factors play in subsequent professional impairment (e.g. burnout, substance abuse). Future research will also hopefully address some of the methodological limitations of the present study. Our correlational design limited us from determining whether personality characteristics preceded distress or whether distressed students were simply more likely to develop and/or report certain perfectionistic traits and impostor concerns. Longitudinal studies of health profession students are needed to address this question. The use of multiple informants to assess students' perfectionism, imposter concerns and psychological distress would also add significantly to the methodology of future studies. In addition, it will be important to replicate the present findings with other university populations, as there may be some factors unique to this sample that influenced these findings. For example, the low response rate of 48% and the small number of minority students who participated may limit the generalizability of our results.

None the less, the present study contributes to the literature by comparing a large sample of students in the four health professions of medicine, dentistry, nursing and pharmacy for the first time. Furthermore, using well-validated measures, we were able to evaluate personality characteristics in health professions stu-

dents that are linked with significant anxiety, depression and suicide risk in the general population but have not been systematically studied in this group of students. The present findings reinforce the importance of assessing for character traits in addition to demographic factors when identifying students who may be at particular risk for maladjustment during training in medicine and the other health professions. Perfectionism and the IP are two such personality traits that need to be addressed with health professions students, and interventions need to be developed to address these factors when they interfere with students' academic performance and/or well-being. Although long-term psychodynamic therapy has been recommended as the treatment of choice for particularly severe cases of perfectionism (e.g. Blatt 1995), this type of intensive intervention may be inappropriate for non-psychiatric populations of students. Rather, students might benefit from open discussion of impostor feelings and perfectionistic traits during programme orientations and peer discussion groups. Just as students often complete personality inventories to discuss in their introductory behavioural medicine or psychiatry classes, it may also be helpful to administer and discuss the MPS and/or CIPS measures to increase awareness of the dangers of perfectionism and the IP. Furthermore, evaluators of student performance should attend to any signs of these maladaptive traits and encourage more realistic perceptions through modelling, normalizing of students' concerns and provision of specific feedback on faculty expectations of students. Finally, counselling centres associated with medical schools may want to address pathological perfectionism and the IP through workshops, group treatments or brief individual therapy. In our experience at the MUSC student counselling centre, students who are introduced to these concepts within the context of cognitive therapy often experience a sense of relief that their attitudes and concerns are a common problem among health professions students, and providing labels to describe these traits gives students a language to discuss their concerns and work on altering these maladaptive traits.

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REFERENCES

Abeshaus D B, Epstein L C, Kane A B & Monteiro L A (1993) The status of women in medicine at the Brown University School of Medicine. *Rhode Island Medicine* **76**, 337–40.

Bickel J & Quinnie R (1992) *Women in medicine statistics*. Association of American Medical Colleges, Washington, DC.

Blatt S (1995) The destructiveness of perfectionism: implications for the treatment of depression. *American Psychologist* **50**, 1003–20.

Boulet J & Boss M (1991) Reliability and validity of the Brief Symptom Inventory. *Psychological Assessment: A Journal of Consulting and Clinical Psychology* **3**, 433–7.

Chrisman S M, Pieper W A, Clance P R, Holland C L & Glickauf-Hughes C (1995) Validation of the Clance impostor phenomenon Scale. *Journal of Personality Assessment* **65**, 456–67.

Clance P (1985) *The impostor phenomenon: overcoming the fear that haunts your success*. Peachtree, Atlanta.

Clance P & Imes S (1978) The impostor phenomenon in high achieving women: dynamics and therapeutic intervention. *Psychotherapy: Theory, Research, and Practice* **15**, 241–7.

Clark E J & Rieker P P (1986) Gender differences in relationships and stress of medical and law students. *Journal of Medical Education* **61**, 32–40.

Coombs R H & Fawzy F I (1982) The effect of marital status on stress in medical school. *American Journal of Psychiatry* **139**, 1490–3.

Derogatis L & Melisaratos N (1983) The Brief Symptom Inventory: an introductory report. *Psychological Medicine* **13**, 596–605.

Derogatis L & Spencer P (1982) *The Brief Symptom Inventory (BSI): administration, scoring, and procedures manual-I*. Clinical Psychometric Research, Baltimore, MD.

Hendrie H, Clair D, Brittain H & Fadul P (1990) A study of anxiety/depressive symptoms of medical students, house staff, and their spouses/partners. *Journal of Nervous and Mental Disease* **178**, 204–7.

Hewitt P L & Flett G L (1989) The Multidimensional Perfectionism Scale: development and validation. *Canadian Psychology* **30**, 339.

Hewitt P L & Flett G L (1991) Perfectionism in the self and social contexts: conceptualization, assessment, and association with *psychopathology*. *Journal of Personality and Social Psychology* **60**, 456–70.

Holmes S W, Kertay L, Adamson L B, Holland C L & Clance P R (1993) Measuring the impostor phenomenon: a comparison of Clance's IP Scale and Harvey's I-P Scale. *Journal of Personality Assessment* **60**, 48–59.

Lloyd C & Musser L (1989) Psychiatric symptoms in dental students. *Journal of Nervous and Mental Disease* **177**, 61–9.

Niessen L C (1992) Women dentists: 1992 and beyond. *Journal of Dental Education* **56**, 555–60.

Parkerson G, Broadhead W & Chiu-kit J (1990) The health status and life satisfaction of first-year medical students. *Academic Medicine* **65**, 586–8.

Vitaliano P, Russo J, Carr J & Heerwagen J (1984) Medical school pressures and their relationship to anxiety. *Journal of Nervous and Mental Disease* **172**, 730–6.

Wolf T M (1994) Stress, coping, and health: enhancing well-being during medical school. *Medical Education* **28**, 8–17.

Zoccolillo M, Murphy G & Wetzel R (1986) Depression among medical students. *Journal of Affective Disorders* **11**, 91–6.