ORIGINAL ARTICLES

Chiropractic Interns' Perceptions of Stress and Confidence

Adele Mattinat Spegman, PhD, Geisinger Center for Health Research, and **Sean Herrin**, DC, Western States Chiropractic College

Objective: Psychological stress has been shown to influence learning and performance among medical and graduate students. Few studies have examined psychological stress in chiropractic students and interns. This preliminary study explored interns' perceptions around stress and confidence at the midpoint of professional training. **Methods**: This pilot study used a mixed-methods approach, combining rating scales and modified qualitative methods, to explore interns' lived experience. Eighty-eight interns provided ratings of stress and confidence and narrative responses to broad questions. **Results**: Participants reported multiple sources of stress; stress and confidence ratings were inversely related. Interns described stress as forced priorities, inadequate time, and perceptions of weak performance. Two themes, ``convey respect'' and ``guide real-world learning,'' describe faculty actions that minimized stress and promoted confidence. **Conclusion**: Chiropractic interns experience varying degrees of stress, which is managed with diverse strategies. The development of confidence appears to be influenced by the consistency and manner in which feedback is provided. Although faculty cannot control the amount or sources of stress, awareness of interns' perceptions can strengthen our effectiveness as educators. (The Journal of Chiropractic Education 21(2): 129–137, 2007)

Key Indexing Terms: education, professional; mixed methods; qualitative studies; stress, psychological

INTRODUCTION

Psychological stress, or distress, has long been regarded as an influence on learning and performance.[1,2] It serves to motivate some students, yet overwhelms others. Most acknowledge that distress can exert inadvertent negative effects on students' studies, health, or personal lives. Anecdotally, an interaction between stress and self-confidence has been suggested by chiropractic faculty, especially apparent as 3rd-year interns struggle with skill performance and observational testing related to clinical training.

Few studies have examined psychological stress in chiropractic students. Lewis and Langworthy[3] found that 3rd-year interns reported less anxiety about clinical situations and procedures than the anxiety levels estimated by their faculty, interpreted to indicate interns' unwarranted confidence or faculty's recall of themselves as interns. Twenty percent of the 225 pre-interns surveyed by Bougie and Singh[4] described patterns of hazardous and harmful alcoholic drinking, a behavior which has been associated with medical and dental students' anxiety, stress, and tension.[5,6] Kinsinger's study of 4th-year interns, which he described as "the first of its kind [with] chiropractic students," found depression rates were similar to the general populations' 25%–30% prevalence.[7]

Archer and Lamnin[8] found that perceptions of stress, reported by a random sample of 893 undergraduate students, were influenced by personal relationships, student–faculty interactions, and emotional support derived from friends. Reports of stress, collected from 120 1st- and 2nd-year medical students, were attributed to the complexity and volume of material, time constraints, examinations, and the

The Journal of Chiropractic Education

Vol. 21, No. 2. Printed in U.S.A.
1042-5055/$22.00

ambiguity of expectations; variations in students' stress was related to specific features of the curriculum.[9] In research with graduate students, stress has been correlated with low self-esteem[10,11] and with sleep patterns, exercise habits, and negative mood.[12] Stress in graduate and medical students has also been associated with the developmental demands of young adulthood, including intimate relationships, parental conflicts, and finances.[8,9,13]

The evidence of psychological distress in medical student spans 30 years, yet the authors of a systematic review were unable to make firm conclusions regarding its causes or consequences.[14] Intense stress predicted clinical depression and somatic distress in 3rd-year medical students; distress symptoms increased with the use of disengagement coping strategies (eg, social withdrawal, problem avoidance) and decreased with engagement strategies (cognitive restructuring, problem solving).[15] A longitudinal study examining relationships between mood and academic performance reported depression scores to be unrelated to 1st- and 2nd-year medical students' grade point average (GPA), yet higher scores (indicating severity of depression) were inversely related to the students' scores on the National Board of Medical Examiners Part I exam.[16] Dyrbye and associates' multi-site examination of burnout in medical students suggests that stress is related to personal life events as well as curricular factors.[17]

Given the scant literature on psychological stress in chiropractic students, we conducted an exploratory pilot study. The study explored three questions:

1. How do chiropractic interns' perceive stress and confidence?
2. How are these perceptions related?
3. How do interns perceive the way in which the faculty/college influences their experiences of stress and confidence?

We focused on interns at the midpoint of a chiropractic program, considered stressful as the student transitions from the role of student to clinician. Interns' perspectives were examined using qualitative methodologies. This data collection and analysis approach helped us to minimize the influence of faculty and researcher assumptions, which can be subtly conveyed in the selection of data collection instruments.

METHODS

A mixed-methods approach was used to explore interns' perceptions regarding stress and confidence in the academic setting. Quantitative rating scales were used to explore the amount, variability, and relationships between perceived stress and confidence. Qualitative methods, used to analyze the narrative responses to open-ended questions, develop understandings from the participants' viewpoints and experiences.[18,19] This inductive approach is appropriate when the aim is to "make carefully considered judgments about what is really significant and meaningful" (p. 313).[18]

A data collection tool was created for this study (Fig. 1). To focus attention to self-perceived stress and confidence in the current academic context, two items requested global ratings of stress (0 = none to 10 = extreme) and confidence (1 = little to 10 = high); the reliability and validity of the scales have not been examined. Five open-ended questions prompted narrative responses regarding experiences and opinions about stress and confidence.

Global rating scales	
Stress	How stressed out do you feel? 0 = no stress to 10 = extremely stressed
Confidence	Overall, how confident do you feel as an intern now? 1 = not at all to 10 = very confident
Narrative data: open-ended questions	
1. Consider the multiple facets of your life. What do you consider to be current sources of stress?	
2. How does "feeling stressed" influence your clinical learning and overall performance as a student?	
3. What do you think the college/faculty could do to reduce your stress level?	
4. What things do you identify as affecting your overall confidence in yourself as a health care provider, either positively or negatively?	
5. What could the college or faculty do to help your confidence level?	

Figure 1. Data collection instrument used for the study.

Demographic information was limited to the interns' current quarter of study. The tool required approximately 15 minutes to complete.

The study was approved by the Institutional Review Board of Western States Chiropractic College. Interns attending two 7th-quarter and three 8th-quarter lab classes were invited to participate. We focused on this group of interns because, in this program, the 7th-quarter marks the beginning of intern–patient interaction. Information about the study was presented by a researcher during a class session following midquarter exams; all data collection occurred in the lab setting. To ensure anonymity, consent was implied when the questionnaire was completed to prevent discovering participants' identifies.

Inductively derived findings provide descriptions and insights into the phenomena rather than to count, explain, or predict—unlike quantitative analysis. This approach considers the experiences and perceptions from the viewpoint of the participants rather than from the researcher's perspective. It is an appropriate design for a preliminary study, because it helps to identify the salient concepts apart from those which the research team assumes to be important. Qualitative methodology acknowledges that individuals understand experiences differently, as social meanings are constructed by the individual. Accordingly, just as perceptions vary among interns, it is likely that intern perceptions differ from those of faculty because faculty perspectives were shaped in a different context and historical time.

Unlike quantitative methods, *generalizability* is not an aim of qualitative analysis.[18–21] Because the aim and methods of qualitative research designs differ from those of quantitative designs, established reliability and validity measures of research rigor are not appropriate.[19,21] Beck[22] has proposed criteria for addressing the scientific rigor of qualitative methods and findings, which were used in this study. The first, *auditability* or *confirmability*, assesses the objectivity of the researchers by requiring descriptions of the data and analysis process so others can arrive at comparable (not contradictory) understandings. C*redibility* refers to confidence in the truthfulness of the data so that others in similar situations recognize the data and findings as an accurate portrayal of their own experience. Finally, *fittingness* or *transferability* addresses the relevance and applicability of the findings for others in similar situations but different settings.

Modified qualitative analysis methods were used in this study. Both authors independently read the data to identify initial topics, drawing on complementary expertise in research and chiropractic education. We began by examining responses according to the interns' quarter of study, generating 8 to 10 different topics for each of five open-ended questions. Because the initial labels were similar for both sets of interns, the data were combined for the remainder of the analysis. Our interpretations were refined over several months, using a process of constant comparison in which the data are coded to identify salient meanings, categories, and themes. The labels were revised and collapsed until the topics were distilled into consistent core themes. We reviewed the data individually and then met weekly to articulate and discuss our understandings until agreement was reached on the underlying meanings. Throughout all stages, transcribed responses rather than data codes were used to retain participant words and preserve meanings. Toward the end of the analysis, the credibility of the data and the understandings generated through our analysis were examined with another set of interns nearing graduation, none of whom contributed to the initial data set, and with chiropractic faculty on campus and at a conference on chiropractic education.

RESULTS

Data were provided by 88 (95%) of the 93 interns invited to participate. This sample represents 75% of the college's matriculated students holding 7th- or 8th-quarter status at the time of data collection. The registrar reported this set of students to be 18–46 years of age ($M = 29$; $SD = 5.1$), predominantly male (68%), Caucasian (82%), and U.S. citizens (88%) (Table 1).

Global Ratings

The rating scales were analyzed using SPSS version 15.0 (SPSS Inc, Chicago, IL). The global ratings of perceived stress and confidence ranged from 1 to 9; no participants reported outermost ratings of stress (0 = no stress; 10 = extreme stress) or high confidence (10 = very confident). Interns enrolled in the 8th quarter reported slightly less stress and more confidence than those in 7th quarter (Table 2). The inverse association, examined as a

Table 1. Matriculated Student Profiles at Data Collection: Characteristics According to Academic Status

Characteristic	Matriculated student profiles: 7th Quarter ($n = 57$)	8th Quarter ($n = 60$)
Age	23–39 years	18–46 years
M (SD)	28 (4.5)	28 (5.7)
Gender	57% male	79% male
Race	90% Caucasian	76% Caucasian
Non-U.S. citizen	3 (5%)	16 (18%)

Table 2. Global Ratings of Stress and Confidence According to Quarter of Study

Variable	7th-Quarter interns	8th-Quarter interns
Stress		
M (SD)	6.43 (1.89)	5.48 (1.74)
Median (range)	7 (2–9)	6 (1–9)
Confidence		
M (SD)	4.29 (1.58)	6.36 (1.37)
Median (range)	4 (1–8)	7 (3–9)

two-tailed Kendall's tau as the normality assumptions were unmet and a large number of ranks were tied, was significant only for the 8th-quarter reports: $\hat{o} = -0.285,\ p \leq .05$.

The scatter-plot revealed that although stress and confidence were inversely related for many interns, there were several outliers (Fig. 2). The outliers were further examined by recoding the rating scores (1–9) as interval-level data to reflect increasing amounts of stress and confidence (1–3 = minimal; 4–5 = moderate; 6–7 = much; 8–9 = high). As shown in Figure 3, many 7th-quarter interns reported much or high stress regardless of perceived confidence. The sole rating of high confidence in the 7th quarter was paired with high stress; in contrast, none of the highly confident 8th-quarter interns reported high stress. Minimal confidence ratings in the 7th quarter were paired with all levels of stress, while minimally confident 8th-quarter interns reported higher levels of stress.

Narrative Responses

Perceptions of Stress

The sources of stress, as identified in responses to an open-ended question, described five broad

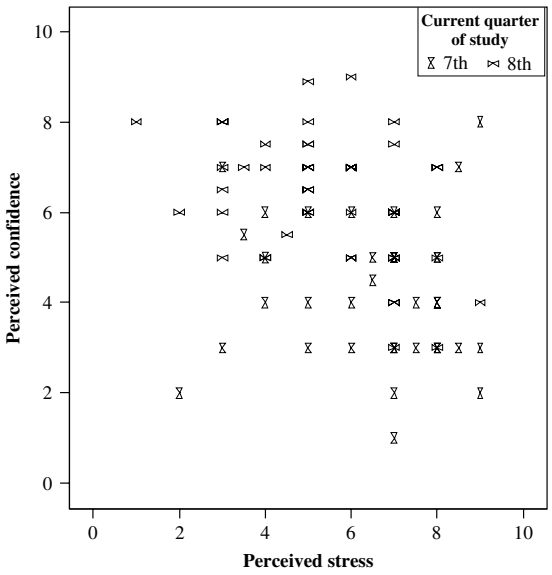

Figure 2. Associations between stress and confidence according to quarter of study: scatterplot of scale-level data.

and interrelated issues: school/academics, personal relationships, time, finances, and sleep. For both groups of interns, multiple sources of stress were identified by 75% of interns; 40% identified three or more sources. The majority of interns portrayed stress as a negative force which hindered student performance. Three distinct themes were identified.

Motivates. Stress was described by a few participants as a positive influence, providing a source of motivation to do more and perform better. It was considered as helpful, pushing the student to complete projects and study long hours. For these interns, stress was the fuel that kept them going.

Forces priorities. Other participants emphasized the relative nature of stress. Moderate amounts of stress were expected and tolerable; increased amounts upset the tenuous allocation of time and energy. Although viewed as an inevitable component of the program, the effects of accumulated stress were considered to be problematic. As stress increased in relation to the number of concurrent assignments and exams, it forced decisions about the relative importance of individual courses. Rising stress levels also lowered effort and personal expectations for academic success. The importance of adequate study time outside of class competed with relationships and family responsibilities. Participants described a need to "choose battles" and "give up life apart from school."

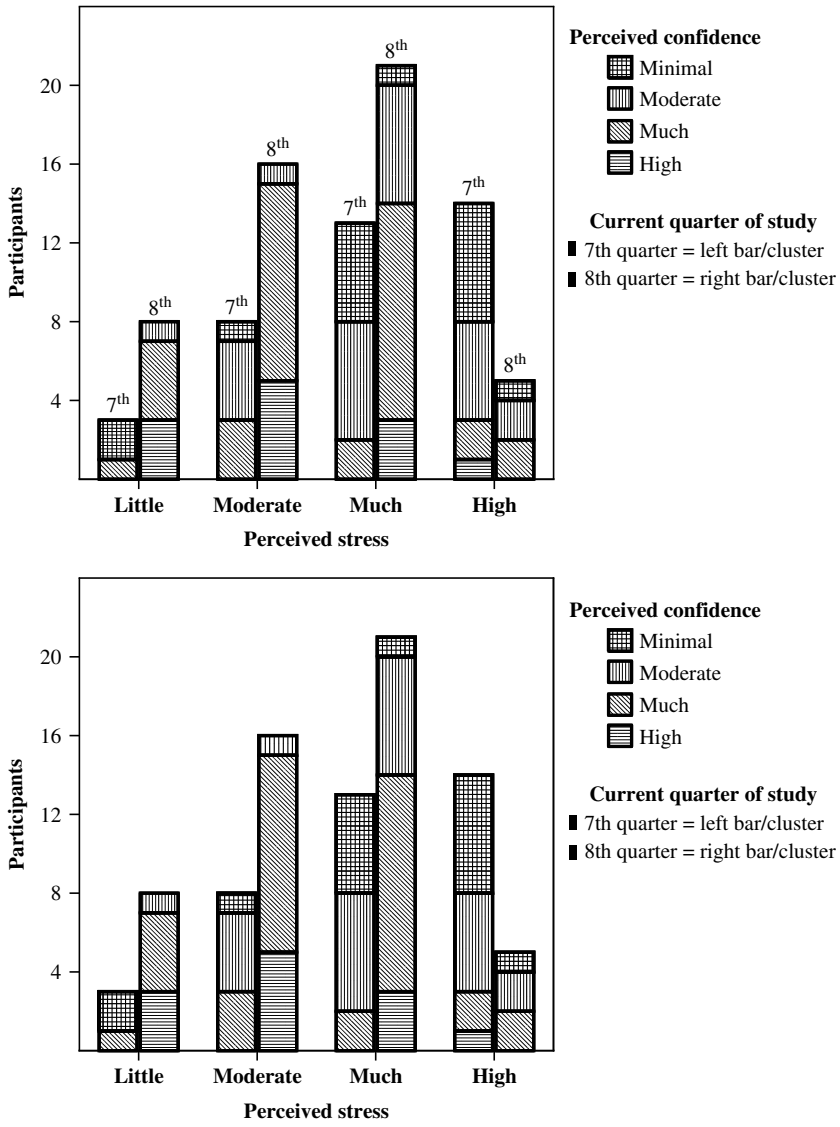

Figure 3. Relationships between stress and confidence according to quarter of study: interval-level data.

> I am worried about paying bills and getting home so my wife can work and I can baby-sit, so I am not spending time studying…. I always feel I should be [doing] something for school—guilty for taking time for family and stuff.

Diminishes and hurts. The effects of stress were also described as degrees of burnout. High stress levels and decreased academic performance were attributed to inadequate time for absorbing important content. A cyclical process was described: stress decreased memory and ability to focus, resulting in poor performance (academic and clinical) and causing more stress. Some participants reported lost passion, lowered drive, or questions about their decision to pursue chiropractic. A troubling subset underscored the influence of stress on mental health, with descriptions of constant fatigue, short temper, and frustration.

> I'm an educational bulimic … I cram it in for the test and forget most of it right after the exam and start cramming info for the next exam.
> … makes performing and learning sub-par because being relaxed and calm is difficult, so mistakes are easier to make and snowball once made.

Perceptions of Confidence

Confidence was described as an important criterion for success as a chiropractor. Although it was sometimes presented as an intrinsic quality of the self, as something that "either you have or you don't," many responses differentiated genuine

clinical confidence from that of the confident personality and implied that confidence was acquired throughout the educational program. Four themes emerged regarding developing confidence as a health care provider: experience, ability, feedback, and despair.

Experience. Confidence was linked to accumulated experiences and exposure to a variety of clinical conditions. Mastery of clinical skills is possible only with repeated practice and by providing care to diverse patients. Confidence is earned over time; it is anticipated to grow throughout clinical rotations and progression through the program.

Ability. Confidence was also described according to specific psychomotor skill levels, especially related to adjusting skills. The ability to perform was essential; cognitive understandings were inadequate without corresponding advanced skill levels. Interestingly, no participants specified whose judgment conferred the adequacy of skills needed for confidence.

> I feel like I'm a really effective adjustor for where I should be right now—especially in relation to others.
> History taking and diagnostic skills are sub-par and bring my confidence down.

Feedback. Confidence was instilled or diminished by the reactions of others, including explicit comments as well as subtle acknowledgments or criticisms. The responses suggested that confidence in one's abilities should not be trusted without validation. While feedback was typically identified as coming from faculty, clinicians, and peers, some participants highlighted the importance of patient comments. Postcare patient responses provided a measure of clinical skills, thus strengthening and validating confidence—or doubt.

Despair. The lack of confidence, expressed by few, was articulated as despair. These participants projected a sense of powerlessness and an inability to remedy their academic plight. The poignancy of these responses is troubling. While it is possible that this data reflects a snapshot of a fleeting "crisis moment," such comments can also be understood as a plea for help.

> The things I know I am missing but can't [do] anything about, like key points in [a] history or how to do or interpret exam results. How to adjust certain difficult areas is always an enigma. I am worried that my adjusting is suffering because there's no time to practice.

Faculty Actions

Interns' perceptions were examined regarding college/faculty actions which might lessen stress and increase confidence. Contrary to our concern that such questions might open a Pandora's Box, the responses reflected insight and thoughtful consideration. A small set of participants, in both quarters, responded "Do nothing." Most often, this response was paired with views of stress as a motivating force and an overall sense of confidence. In contrast, the majority appealed for a change in faculty behavior, which supported two themes: convey respect and real-world learning.

Convey respect. The responses described inverse relationships between stress and respect, with a sense of being respected minimizing stress. Participants described ripple effects of respect: minimal feelings of stress supported effective learning, which increased confidence. Two distinct notions of respect were presented.

It was important for participants to feel respected as a learner. Many responses highlighted the impact of a faculty's communication style on the student psyche. Effective learning was diminished when students felt demeaned or threatened in a classroom setting; learning was enhanced when faculty held high standards and simultaneously acknowledged that mistakes are a normal component of learning. It was also important for faculty to convey a sincere openness to questions and recognition of the difficulties inherent in the learning process.

> I think many faculty need to (learn how to) communicate in a way that is not condescending or insensitive. I think there are too many teachers who students don't want to approach for fear of feeling like they will be made fools of.

Respect was also conveyed by valuing time. Time was consistently described as a scarce resource, inadequate and insufficient for effective learning. Likewise, effective and efficient teaching was described in relation to faculty teaching styles. Most participants did not view faculty to be cognizant of the competing demands of concurrent assignments, clinical duties, and scheduling. While it was acceptable to devote time to skills or knowledge that was clearly relevant to chiropractic practice, participants regarded some assignments and/or required courses as "hoops to jump through."

> Be very organized. Be very clear on instructions. Be consistent. Teach what is expected of us before making us do it.

Guide and integrate "real-world learning." The participants valued teaching approaches which connected learning with realistic clinical situations. One-on-one learning was highlighted for its access to someone with advanced skills, the safety of the learning situation, and the immediate, learner-specific feedback. Participants identified a broad range of potential mentors—faculty, clinicians, teaching assistants, practicing chiropractors, and upper level interns. Within classroom settings, the participants acknowledged the complexity of integrating knowledge into practice. Effective teaching was described in terms of the relevance of content to future practice and evaluation methods which challenged understandings. Overall, faculty's teaching methods were linked—positively or negatively—with participants' skill development, cognitive understandings, and self-confidence.

DISCUSSION

The findings derived from this study provide insights into chiropractic interns' perceptions of stress and suggest salient influences on the transition to clinician. The response rate and thoughtfulness conveyed in responses are evidence that, for these participants, stress and confidence are important issues. Stress was a predominant experience, widely perceived as exerting detrimental effects on learning and clinical performance. The sources of stress identified by the participants are not unique to chiropractic interns.[8–9] The irony of a health care training program's association with negative emotional and physical changes in its students is not unique to chiropractic education, as similar issues are recognized with medical students and interns.[14] However, the paradox is heightened with chiropractic's emphasis on health promotion.

We had assumed that the ratings would illustrate an inverse relationship between stress and confidence. The 7th-quarter students reported higher stress and lower confidence than those in the 8th quarter. The majority of participants indicated moderate levels of both stress and confidence, likely reflecting the angst typical at the midpoint of professional training. The small subset of 7th-quarter interns reporting low stress and low confidence requires careful consideration and additional study, as do the reports of high stress and low confidence received from both groups of interns.

Faculty must be careful not to equate stress levels with effort or level of commitment, and to guard against using labels such as "slackers" or "super star." Effective clinical teaching may be related to an instructor's insight into the possible underlying issues. Interns reporting low stress and high confidence likely include those who are competent and relaxed as well as interns who are overconfident with unrealistic estimations of their abilities. The latter group can be very problematic because of their tendency to overlook details and avoid faculty guidance. Similarly, interns reporting high stress and low confidence may include those who are academically struggling as well as those who seek continual reassurance of appropriate skills and understandings. Such neediness can create a frustrating situation for faculty, diverting resources from other students while doing little to address the targeted students' stress or confidence. Furthermore, many interns reported moderate confidence and high stress. These students may seem to have it all together as their stress is not apparent and thus receive less attention from faculty.

The qualitative data suggest that the emotional effects of faculty's feedback may be as important as its factual content. The manner in which feedback is provided—voice tone, timing, and facial expression—defines an atmosphere of guidance and encouragement or criticism and disapproval. A recurrent theme in these data involved the importance of timely feedback, which instilled confidence as mistakes were corrected. The appeal of individualized attention was not surprising given that chiropractic techniques depend on the mastery of complex psychomotor skills. It is logical that realistic self-assessment skills are nurtured through ongoing and supportive feedback.

Finally, the qualitative analysis highlighted interns' use of relevance as the criteria to bestow value for class content and priority to assignments. Directly and indirectly, participants described a desire for clinical perspectives to be integrated throughout all courses. The bottom line—how useful is the course material for future practice—may be a reflection of the large amount of knowledge and skills for which the interns are required to demonstrate competency during the program. It may also suggest that reevaluation of the relevance of some classes and assignments is needed. Alternately, as relevance is highlighted throughout K–12 teaching strategies, its importance may be internalized. The key message for faculty is to clearly relate the value

and relevance of class content and assignments for developing the cognitive understandings and skills required of professional practice.

Several limitations are recognized. The quantitative findings cannot be generalized, as the data were collected from a small convenience sample with an untested scale. No data were collected to examine the influences exerted by GPA, gender, age or lifestyle events such as marriage, birth/adoption, major illness, or death of family member. The narrative data may have been influenced by the use of paper-and-pencil data collection methods. The modified qualitative methods did not allow us to clarify meanings, seek extended descriptions, or explore emerging interpretations with participants. Finally, our interpretations were not confirmed with the participants who provided the qualitative data.

Additional research, with interns enrolled in other quarters and at other colleges, is needed to better understand these findings. Research with established measurement tools is needed to examine the occurrence of depression and use of disengaged coping strategies among chiropractic interns. Likewise, semi-structured interviews with interns at beginning and end points of the chiropractic program may provide insights regarding the development and resolution of stress throughout the chiropractic program. The qualitative findings suggest that the concepts of burnout and engagement better describe participants' perceptions of experiences during their professional training. Our next study will use validated instruments to examine these concepts in relation to personal life events and coping strategies.

CONCLUSIONS

The mixed-methods approach helped us to explore interns' perceptions without overlaying our own assumptions about their academic experiences. The findings underscore important messages for faculty. The sources and detrimental effects of stress experienced by chiropractic interns are comparable with those reported by graduate students and medical interns; the similarities imply that adverse stress levels are likely related to the processes and rigors of training rather than the discipline studied. The qualitative themes indicated that the experience of stress varies and is managed with diverse strategies. As faculty, we must be open to considering the participants' comments without questioning the validity of their perceptions. It is easy to disregard the unintended consequences of a rigorous professional program. Although faculty cannot control the various stressors, awareness of interns' perceptions can strengthen our effectiveness as educators.

Received, January 15, 2007
Revised, April 4, 2007; May 15, 2007
Accepted, May 18, 2007
Address correspondence to: Dr. Sean Herrin, Student Health Clinic, Western States Chiropractic College, 2900 N.E. 132nd Avenue, Portland, OR 97230-3099; sherrin@wschiro.edu.

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