Development of Junior Faculty's Self-efficacy: Outcomes of a National Center of Leadership in Academic Medicine

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In 2000, several articles were published discussing the importance of academic medical centers' addressing the attitudes and obstacles junior faculty have concerning their career progress and success.[1–3] All agreed that formal mentoring programs, whether gender-based or work-environment–driven, would have positive effects on junior faculty's performance, attracting and retaining those who have chosen academic medicine as their careers. In 1998, the Office of Women's Health within the U.S. Department of Health and Human Services created four National Centers of Leadership in Academic Medicine (NCLAMs) to help faculty members of both sexes obtain mentors and thereby facilitate their career advancement.[4] This study is the first in a series of reports of outcome data collected by the University of California, San Diego's (UCSD's) NCLAM in evaluating whether a formal mentoring process in an academic medical center has an impact on junior faculty's self-efficacy, thereby leading to development of career competency.

Mentoring has traditionally been viewed as a human resource strategy for enhanced leadership development, professional socialization, and competence in education and business training.[5] Few studies have addressed the significance of formal mentoring in the development of professionals in the field of health care.[6] Review of the literature showed that those studying the concept of mentoring have proven a strong correlation with the concept of self-efficacy.[7,8] Self-efficacy is one's personal belief or conviction in the ability to carry out a behavior that will produce a particular outcome, a sense of confidence that one can organize and complete a behavior competently.[9] In other professional-education literature, self-efficacy has been seen as an important motivational construct. It influences both goal and goal attainment, an individual's choice of activities and tasks, and his or her coping skills while engaged in those tasks.[10,11] An effective mentorship program in academic medicine, therefore, should be able to facilitate the self-efficacy of the participant through encouragement, recognition of potential, role modeling, and promotion of opportunities. Self-efficacy is the mentoring outcome of information cognitively processed by a participant through performances needed to fit changing circumstances in his or her career.

Method

The cornerstone of the UCSD NCLAM program was to design a formal mentorship process that matched the administrative style of a leading research institution embedded in a competitive, managed-care environment. The program emphasized an understanding of the institution's educational mission, as well as the many needs of the clinical practice environment in Southern California by selecting not one but a series of interventions designed to improve each participant's diverse academic performance. These interventions included (1) required participation in 12 half-day faculty development workshops (Goal Setting and Academic Portfolio; Prin-

ciples of Teaching and Learning; Leadership Styles; Negotiation Skills; Stress Management; UCSD Academic Resources; UCSD Grant Resources; Grant Writing; Conflict Resolution; Curriculum Development; Performance Evaluation; and Effective Presentation Skills); (2) an arranged seven-month, one-on-one, senior/junior-faculty mentoring relationship (averaging 12 hours per month); (3) a two-hour academic performance counseling session; and (4) a finished professional development project. The goal of UCSD NCLAM was to improve the productiveness of the overall School of Medicine by improving each individual junior faculty member's connections to his or her career, the senior faculty, the campus, and the organizational resources.[12]

The total population of 163 UCSD junior faculty received a survey asking them to rate their self-confidence concerning 36 professional academic skills. A total of 136 responded, for an 83% return rate and a sample size large enough to allow for a 95% level of confidence. Thirty-nine junior faculty either volunteered or were nominated by their chairs to participate in the seven-month NCLAM program, and the 97 remaining were identified as the control group for this study. Participants in NCLAM were given the survey instrument twice, before they began the experience and then after completion of the program. The junior faculty in the control group were surveyed at the end of the NCLAM program in 2000. Table 1 describes the key demographics of the two junior faculty groups. There was no significant difference between the two groups.

The survey was derived directly from the professional academic skills published by Bland and colleagues[13] as predictors of which faculty members would be achievers and which would not. The UCSD junior faculty were asked to rate their confidence relative to 36 seven-point, semantic-differential items anchored by the descriptors "strong" and "weak."

There were ten items identifying skills involving professional development; ten in skills concerning research; eight in skills concerning education; and eight in skills addressing administration. For

TABLE 1. UCSD Junior Faculty Characteristics, 2000

Characteristic	NCLAM (*n* = 39)	Control (*n* = 97)
Gender		
Women	56%	44%
Men	41%	59%
Age		
Mean	39.5 years	38.9 years
Range	34–45 years	30–58 years
Time as UCSD faculty		
Mean	3.7 years	2.7 years
Range	1–7 years	.5–7.5 years

example, junior faculty were asked, "Identify your level of confidence, from strong to weak, in being able to demonstrate your proficiency in ... (1) identifying your own personal professional goals, interests and rewards (under professional development); (2) developing plans for implementing a study, including timeline, budget, and requirement for personnel, facilities and supplies (research); (3) selecting and preparing instructional materials such as syllabi and visuals (education); and (4) describing the faculty and administrative governance structure (administration)." For assessment purposes, the scale positions between strong and weak were later converted to numerical values from 1 to 7, with 1 representing a weak response and 7 a strong response. The internal consistency reliability of the instrument was .69.

Survey data were analyzed by generating the mean and standard deviation for each category of items on the questionnaire: professional development, research, education, administration, and total. Paired *t*-tests were used to compare the NCLAM participants' self-rated scores before and after the program, and analysis of variance determined the relationship between the NCLAM participants and the control group.

Results

Junior faculty's self-efficacy scores concerning the 36 professional academic skills categorized by Bland and colleagues are presented in Table 2.

Before they participated in the formal mentoring process, NCLAM participants rated themselves significantly less confident than their peers, by 9% in the area of professional development, by 10% in education, and by 20% in administration. Overall, their confidence was 6% lower than that of the control group; however, this difference was not statistically significant.

After completing the entire seven-month NCLAM experience, the 39 junior faculty rated themselves significantly higher in self-confidence in all areas of professional academic skills. Compared with their peers, they were now 34% more confident in their abilities in professional development, 22% more confident in their research capabilities, 20% more confident of their education skills, 44% more sure of their administrative responsibilities, and 29% more confident overall. Those items that showed the greatest increases in confidence by the 39 NCLAM faculty were their confidence in "Describing UCSD's decision-making process regarding finance, personnel, and medical education program responsibilities" (administration; mean average increase of 3.06) and "Developing a promotion package" (professional development; mean average increase of 2.84). The item that showed the smallest increase in confidence was "Critically evaluating a research article" (research; mean average decrease of .02). This content item was not taught in NCLAM.

Discussion and Implications

This study documented that improved self-efficacy concerning critical professional academic skills is a very positive result of a formal mentoring process in health care. While efforts to facilitate junior faculty's attitudes with extrinsic factors such as mandates, rules, and rewards have tried to control performance outside the faculty member's realm, this study demonstrated that efforts made to develop

TABLE 2. UCSD Junior Faculty Self-efficacy Scores, 2000

Skill Categories (No. of Skills)	Mean (SD)	Range	p Value
Professional development (10)			
Pre-NCLAM	39.4 (9.7)	20–57	
Post-NCLAM	58.3 (7.5)	41–70	vs. pre-NCLAM = <.0001
Control group	43.2 (10.3)	21–69	vs. pre-NCLAM = .05
			vs. post-NCLAM = .0001
Research (10)			
Pre-NCLAM	50.5 (13.9)	20–69	
Post-NCLAM	57.4 (10.8)	30–70	vs. pre-NCLAM = <.0001
Control group	47.4 (13.5)	15–70	vs. pre-NCLAM = .23
			vs. post-NCLAM = .0001
Education (8)			
Pre-NCLAM	34.3 (8.2)	14–49	
Post-NCLAM	45.6 (6.3)	27–56	vs. pre-NCLAM = <.0001
Control group	38.1 (8.4)	17–56	vs. pre-NCLAM = .02
			vs. post-NCLAM = .0001
Administration (8)			
Pre-NCLAM	22.9 (8.5)	9–43	
Post-NCLAM	41.1 (7.3)	23–55	vs. pre-NCLAM = <.0001
Control group	28.5 (8.9)	10–51	vs. pre-NCLAM = .001
			vs. post-NCLAM = .0001
Total (36)			
Pre-NCLAM	147.2 (26.8)	88–204	
Post-NCLAM	202.8 (25.1)	140–247	vs. pre-NCLAM = <.0001
Control group	157.3 (31.1)	86–237	vs. pre-NCLAM = .08
			vs. post-NCLAM = .0001

willing faculty members' own internal motivation, based on their own individual experiences and competencies, are very possible.

The hypothesis of the NCLAM design was that mentorship need not be defined in the classic view characterized by a central primary relationship developed over an extended period of time. In the case of this program, a secondary relationship created over a brief period of time, facilitated in both small workshop groups and one-on-one meetings, and developed to acquire special individualized knowledge, significantly influenced junior faculty members' self-perceptions. Programs such as the National Centers of Leadership in Academic Medicine need to be created as the mediator between junior faculty's own self-expectations and actual academic performances.

The literature stated that self-efficacy instruments, although a self-reporting tool, did correlate with choice of activities, effort expended, and persistence.[9] Those who reported low self-efficacy, like the sample NCLAM participants, are shown to avoid tasks. When facing difficulties, self-efficacious learners will expend greater effort and persist longer than their peers. The next critical evaluation step for the UCSD National Center of Leadership in Academic Medicine is to document the outcome performances (appointments, publications, promotions, or resignations) of their participants versus those peers who did not volunteer or were not appointed by their chairs. Identifying successful academic performances related to self-efficacy will enable institutions to assist all willing junior faculty to navigate career success, obtain recognition, and sustain commitment to academic medicine.

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