Outcomes Assessment Related to Professional Growth and Achievements of Baccalaureate Dental Hygiene Graduates


Abstract: The goals of the entry-level baccalaureate dental hygiene (DH) program at the University of California, San Francisco, include the preparation of scholars who will pursue additional study and research and the development of DH educators and leaders in the field of DH. The objective of this study was to evaluate whether the goals of the program were being achieved by assessing the professional growth and achievements of the graduates. Questionnaires were mailed to graduates of classes from 1960 to 2000, and the response rate was 66 percent (N = 468). Results indicated the following: 21 percent of the respondents completed a graduate or professional program, with most degrees being master’s related to education (53 percent) and dental degrees (28 percent); 20 percent have held a faculty position in a DH educational program, with 26 percent holding leadership positions; 60 percent have been regular participants in DH professional organizations, with 36 percent of them holding leadership positions; and 61 percent have been active in a community organization, with 60 percent of them holding leadership positions. This outcomes assessment indicates that many UCSF DH graduates have become scholars, educators, and leaders in DH, and thus, the current program is successful at achieving its educational goals. Future studies should evaluate graduates of other DH programs on similar outcomes measures.

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The Accreditation Standards for Dental Hygiene Education Programs, as developed and implemented by the Commission on Dental Accreditation, mandate that dental hygiene programs establish educational goals and assess outcome measures associated with these goals. Dental hygiene (DH) educators have generally agreed that the goals of baccalaureate degree programs should extend beyond those of associate degree programs and reflect principles of baccalaureate education. When directors and faculty of baccalaureate programs were asked to assign priority to statements related to what a baccalaureate program philosophy should be, the two top-ranked statements were to provide a foundation for a highly educated and clinically skilled dental hygienist and to prepare the dental hygienist for responsibilities in various career roles extending beyond traditional clinical DH practice. These alternative career options could include education, management, public health, and research. It is difficult to determine how many baccalaureate programs are offering learning experiences that develop high levels of proficiency in managerial, education, and research skills. A recent survey of DH educators from both baccalaureate and nonbaccalaureate programs indicated that the baccalaureate programs incorporated greater application of evidence-based philosophies into their curricula. These philosophies included skills in acquiring, assessing, interpreting, critically analyzing, and incorporating the scientific literature into clinical practice. The development of these skills would prepare these students to assume positions of additional responsibility and leadership.

Entry-level (pre-licensure) baccalaureate programs in DH are continually decreasing in number relative to the total number of entry-level programs. It is a concern that if graduates from these programs are making significant contributions to DH in roles extending beyond traditional clinical practice, de-
creasing their numbers will impact the future of the DH profession. The goals of the entry-level baccalaureate program at the University of California, San Francisco (UCSF), as stated in the 1998 Accreditation Self-Study Document, are “to prepare graduates to assume roles as psychosocially aware and biomedically oriented DH clinicians, who will be scholars who will pursue additional study and research at the graduate level; DH educators; and leaders in the field of DH and preventive dentistry, including administrators, change agents and patient advocates who promote oral health care.” Surveys of alumni are frequently used to measure the achievement of program goals. According to Smith, 98 percent of DH programs utilize this mechanism, and behaviors surveyed and their frequency of use were as follows: employment of graduates (94 percent), membership in professional societies (65 percent), postgraduate education (60 percent), and activities in professional societies (50 percent).5 The objective of this investigation was to evaluate whether the goals of the baccalaureate DH program at UCSF were being achieved by assessing the professional growth and achievements of the graduates.

Methods

This study was conducted as approved by the UCSF’s Institutional Review Board Committee for studies involving human subjects. The study population consisted of graduates of the entry-level baccalaureate DH program at UCSF from the classes of 1960 to 2000. The Office of University Development and Alumni Relations provided the names and addresses of members of the selected classes. A fifty-five close-ended item, self-administered questionnaire was developed to elicit responses regarding the graduates’ pursuit of graduate education and their roles as scholars, educators, and leaders in the field of DH. The questionnaire elicited responses to the following domains: demographic information (four questions); education, including interest in enrolling in advanced educational programs (fourteen questions); teaching, including leadership positions (thirteen questions); other employment including positions both related and not related to DH and their settings, such as research (five questions); leadership including participation in both DH professional and community organizations (five questions); and other information related to DH career goals and activities (nine questions). All the graduates with an available address (N = 724) were mailed the questionnaire, a cover letter explaining the importance and purpose of the study, and a stamped return envelope. Identification numbers were used to ensure subject confidentiality, while permitting follow-up of nonrespondents. A second mailing was sent two months later to those individuals who did not respond to the first mailing.

Frequency distributions were tabulated for each survey question to provide descriptive information. Data were analyzed to determine whether responses from each of the four decades were significantly different from each other decade. The Cochran-Armitage test with linear contrasts was used to determine the existence of a significant time trend across the decades of graduation, and the step-down bootstrap multiple testing method was employed to adjust for multiple comparisons.6

Results

Of the 724 questionnaires mailed, a total of 468 questionnaires were returned. In addition, seventeen questionnaires were returned due to incorrect addresses, resulting in an adjusted overall response rate of 66 percent. The numbers of respondents were similar per decade: 118 (1960s), 113 (1970s), 106 (1980s), 118 (1990s+). Responses of the graduates of the class of 2000 were included in the data of the 1990s decade. The total also includes respondents not designating a graduation date.

Respondents were 98.57 percent female, 0.9 percent male, and 0.4 percent not reported. The race/ethnicity distribution was 0.4 percent African-American, 19.2 percent Asian, 75.6 percent Caucasian, 2.4 percent Hispanic, 0.2 percent Native American, and 2.1 percent not reported.

The results will be reviewed according to the outcomes measures, as stated in the goals of the program: scholars, educators, and leaders.

Scholars

Many graduates have attempted to obtain education beyond the DH degree. Twenty-one percent of the graduates have completed a graduate or professional program (Figure 1). The results of the trend test indicated a significant difference (p = 0.012) across decades. Graduates in the 1960s decade had
the highest percentage of advanced degrees (30 percent), which was significantly greater than the percentage of respondents from the other decades who obtained advanced degrees (p = 0.018). Two percent are currently enrolled in postbaccalaureate education, mostly 1990s graduates. Sixty-seven percent were pursuing a degree part-time. In addition to the 23 percent with degrees completed or in progress, 10 percent indicated that they had been enrolled in graduate courses but were no longer pursuing a degree.

Types of degrees obtained varied, most being master’s degrees related to education (53 percent) and dental degrees (28 percent). Seven respondents had completed a doctoral program other than dentistry. Graduates were interested in continuing their education in the future, as judged by the overall response to the question of interest in enrolling in a master’s degree program in DH at UCSF; 118, or 25 percent of the alumni, responded positively. This was especially evident with graduates of the most recent decade; as sixty-two, or 53 percent of this group, expressed an interest in advanced education. Also, 16.5 percent, or seventy-seven graduates, were interested in enrolling in a doctoral level program in DH if one were to be developed.

The specific number of graduates who pursued research was not directly assessed. Overall, there were sixty-five (13 percent) positive responses to the question “Are you currently or have ever been employed in a position related to DH, but other than dental private practice or teaching?” Of those responses, fifteen indicated employment in a clinical research setting and three in a laboratory research setting.

**Educators**

Teaching has been a popular career option for UCSF graduates. Twenty percent of the graduates now hold or previously held a faculty position in a DH educational program (Figure 2). The results of the trend test indicated a difference across decades that approached significance (p = 0.065). However,
the percentage of educators was significantly greater for graduates in the 1990s, as compared to the other respondents (p = 0.014). Of these ninety-five educators in DH programs, fifty-four have been employed part-time, and twenty-eight have volunteered their services. The parent institution of the DH program was a dental school for fifty-eight educators and a community college for thirty-six others. The vast majority of educators have taught in a clinical setting (ninety out of the ninety-five educators). In addition, thirty-four have taught didactic classes, and thirteen have taught in dental and science laboratories.

A few (thirteen, or 4 percent) of the graduates currently hold or previously held a faculty position in an educational program for dental assisting students. Although not a specific question on the survey, four graduates stated that they taught in a dental predoctoral program.

**Leaders**

Graduates demonstrated leadership in a variety of settings. Twenty-six percent of the educators hold or have held leadership positions at their educational institutions. They assumed such positions as program director, clinic coordinator, lead clinical instructor, and chair of committees.

Regarding DH professional organizations, such as the American Dental Hygienists’ Association, 280 or 60 percent of the alumni currently or have ever been a regular participant (Figure 3). No significant difference across decades was indicated by the results of the trend test (p = 0.592). Most of the participation occurred at the local level (265 responses), but high numbers of graduates also participated at the state (132 responses) and national (108 responses) level. The latter was especially true with the 1990s graduates.

![Figure 2. Percentage of respondents by decade of graduation who currently hold or have ever held a faculty position in a dental hygiene program. The 1990s+ decade was significantly different from all other decades (p = 0.014).](image-url)
Twenty-two percent of the graduates held a leadership position in the DH professional organization (Figure 4). The results of the trend test indicated a significant difference across decades (p = 0.0044). The percentages of graduates in the 1960s and 1970s assuming leadership roles were significantly greater than those of the 1980s and 1990s graduates (p <0.0001). Respondents indicated holding the following positions: president (twenty-eight), vice president (sixteen), secretary (fifteen), treasurer (fifteen), trustee (ten), newsletter editor (fifteen), committee chair (twenty-eight), board member (four), and other (twenty-two).

Community organizations are another setting in which graduates assumed leadership roles. Sixty-one percent are currently or have been active in a community organization (Figure 5). A highly significant difference across decades was observed by the trend test (p <0.0001). The percentage of graduates from the 1960s and 1970s decades had significantly greater participation than those from the 1980s and 1990s decade (p <0.0001). The most popular organizations were educational (pre-kindergarten through high school), nonprofit, and religious. Of those 286 graduates who were active in these organizations, 60 percent held leadership positions.

Discussion

The goals of the entry-level baccalaureate DH program at UCSF include the preparation of scholars who will pursue additional study and research and the development of DH educators and leaders in the field of DH. The results of this survey indicate that many graduates have become scholars, educators, and leaders.
As the length of time since graduation increased, the number of graduates with advanced degrees increased. A number of years since graduation is usually required to complete a graduate program because most hygienists are pursuing the degrees part-time while they are engaged in clinical practice. Furthermore, over a quarter of the graduates expressed interest in continuing their education in the future. This interest was also evident in the findings from the survey of entry-level baccalaureate DH graduates of the University of Washington. Out of the forty-four respondents, only one (1 percent) had completed a further academic degree, and three (7 percent) were currently enrolled in an advanced education program, but sixteen (36 percent) indicated plans to pursue a master’s degree and two (5 percent) a doctoral degree.

There are additional explanations for the significantly higher numbers of advanced degrees in the 1960s. During that time there were many institutional training grants from private and governmental sources that provided ample stipends to hygienists enrolled in full-time graduate study. This funding removed the financial barrier that often discourages further education. Also, many aspects of our societal environment, especially those affecting women and careers, changed in the late 1960s. As career options expanded beyond the traditional female professions, these female graduates may have returned to school to pursue traditional male fields, which initially they had been discouraged from entering. In the 1980s, when the dental applicant pool was low, hygienists were often recruited to study dentistry. Also in the more recent decades, fewer women who

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**Figure 4.** Percentage of respondents by decade of graduation who have held leadership positions in DH professional organizations, depicting also the percentage of respondents who were not members of the organization. The 1960s and 1970s decades were significantly different from the 1980s and 1990s+ decades in the percentage of respondents holding leadership positions (p <0.0001).
are committed to furthering their education beyond the entry-level degree may be selecting dental hygiene as a career goal.

The type of graduate program in which a student enrolls may be a result of the availability of specific programs in the area. Many UCSF graduates remain in the greater San Francisco Bay area, the location of several educational institutions that offer degrees in education, public health, and dentistry. Graduates who are committed to this region select these alternative programs, since there is no master’s degree program specifically in dental hygiene on the west coast. The DH program at UCSF is in the process of developing a master’s degree program in dental hygiene. This plan is supported by the high number of graduates who expressed interest in enrolling in that graduate program.

Involvement in research can be at several levels, and unfortunately this survey did not distinguish the level of participation. At one level are the principal investigators of studies funded by the federal government, organizations, or industry. These dental hygienists are usually trained at the doctoral level, are employed as faculty in universities, and conduct independent and collaborative research as part of their academic responsibilities. There are other dental hygienists who participate in research by organizing and carrying out clinical or laboratory protocols designed by others. These latter opportunities are limited and often do not provide stable long-term employment, due to their erratic funding. Although large oral health care industries do employ dental hygienists to conduct product research, opportunities are currently limited. It is not surprising that the number of respondents reporting careers in research was low. In the study of University of Washington graduates no respondents were involved in research.5

Many graduates have contributed to the education of future dental hygienists. There are many opportunities to teach in northern California. In ad-

Figure 5. Percentage of respondents by decade of graduation who are currently or have ever been active in a community organization. The 1960s and 1970s decades were significantly different from the 1980s and 1990s+ decade (p <0.0001).
dition to the UCSF baccalaureate program, there are eight programs affiliated with community colleges. These programs usually require faculty to have at least a baccalaureate degree and prefer a master’s degree. The number of part-time instructors is high because most hygienists practice in private dental offices while they teach. This is often an economic issue due to the large disparity of salaries between private practice and educational institutions. While concurrently working in private practice may help the instructor teach these clinical skills to the students, large numbers of part-time faculty may also be a huge detriment to the quality of teaching due to issues of calibration. The high number of graduates teaching at a DH program in a dental school may be because many graduates have been hired by the UCSF DH program to teach one or two clinic sessions per week. That reason may also explain the greater number of 1990s graduates holding faculty positions.

Teaching is a popular choice for dental hygienists. The growing number of associate degree DH programs and the requisite low student/faculty ratio contribute to a high demand for faculty. Many master’s degree programs emphasize the preparation of DH educators. Five (11 percent) respondents of the University of Washington study indicated their practice setting was educational.7

Very few graduates are teaching in educational programs for dental assisting students. This finding could be due to the lack of interest or clinical confidence in dental assisting skills.

Graduates were active participants in DH professional organizations, presumably ADHA. Nationwide there are over 35,000 members of ADHA8 and approximately 120,000 licensed dental hygienists, resulting in approximately 34 percent of dental hygienists who are members. Thus, the percentage of UCSF graduates (60 percent) who indicated being a regular participant demonstrates a higher rate of support for their professional organization. There are many factors contributing to this high participation, perhaps none directly related to a baccalaureate degree. UCSF faculty may be promoting the professional organization well. Active student ADHA chapters also may be credited for the high number of active participants in the most recent decade. During school the students are encouraged to participate, and many find these events enjoyable. This carries over through the first few years of practicing. Also, the ADHA meetings and events may offer an opportunity to socialize with their former classmates.

Furthermore, the number of graduates assuming leadership roles was high: 21.2 percent of total respondents. In a survey of DH master’s degree graduates, while ADHA membership was high (97 percent), the level of actual participation of these graduates was not assessed.9 The present study focused on the type of leadership positions (president, other officers, trustee, committee chair, etc.), rather than the organizational level of participation (national, state, local). However, it appeared that most positions were at the state and local levels. The fact that more graduates of the earlier, as compared to the later, decades have held leadership positions is not surprising since time is involved in progressively increasing one’s participation in an organization leading to leadership roles.

Participation in community organizations is also lower for the more recent decades. Changes in the dental health education class may be a factor. Previous teaching experiences focused on students teaching in the community schools, while currently it is lecturing in a DH program that is emphasized. In addition, the most popular types of community organizations are mostly related to one’s family life. It is natural that one becomes more involved in these organizations when one’s children participate in the activities.

An economic analysis of the need and demand for DH services is beyond the scope of this paper. However, factors such as population growth, especially in some regions of the country, an increasing life span with more people maintaining their teeth throughout life, and a growing elderly and medically compromised population would all suggest an increasing need for DH services. In an attempt to meet this need, new DH programs are continually being established. However, most of these new programs are based in two-year institutions. For example, of the five entry-level programs newly accredited as of July 2001, all five were in a community college setting. In contrast, the only two programs being phased out were at the baccalaureate level.4 The relative numbers of this type of entry-level DH programs have been steadily decreasing. For example, in 1968, of the sixty-seven entry-level programs, twenty-six offered a baccalaureate degree in DH,10 while in 2002 this number was thirty out of a total of 260 programs.4 Only approximately 10 percent of entry-level programs are now at the baccalaureate level.
At the same time, due to the increasing number of educational programs, there is a nationwide shortage of qualified DH educators. While current evidence may be anecdotal, a 1996 survey of program directors indicated that 61 percent had had a full-time DH faculty position vacancy at their institution between 1994 and 1996. In a recent description of trends in DH education, this shortage was discussed as resulting from the decrease in baccalaureate programs, causing fewer hygienists to continue on with advanced education, which is usually required for teaching positions. As in dental education, the current DH faculty is aging. The average age nationwide is forty-six, so this shortage of DH faculty may become critical in future years. Even in times of budget deficits, it is important that dental and university administrators consider the impact of closing entry-level baccalaureate programs on the future of the DH profession because future educators, leaders, and researchers often come from these programs.

Conclusions

Assessment of four decades of graduates from the baccalaureate DH program at UCSF revealed that many graduates have become scholars, educators, and leaders in the field of DH. These results suggest that the current UCSF program is successful at achieving its educational goals.

Although the numbers of graduates who have become scholars, educators, and leaders appear to be high, limited data are available to compare these findings with those of other entry-level baccalaureate DH programs. Furthermore, other baccalaureate programs may have different philosophies and goals and, thus, should not be evaluated by the same criteria as used in this study. Further research is needed at the national level to determine if graduates of other entry-level baccalaureate DH programs also are serving the needs of the DH profession and the public in a variety of roles extending beyond traditional clinical practice and to determine if these graduates are different in this regard from those of associated degree programs and degree completion programs. If graduates of entry-level baccalaureate DH programs are making unique significant contributions, compared to other types of DH educational programs, then the trend toward closing these types of programs may be creating a critical void in the profession.

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REFERENCES