

## Factors Associated with Burnout among Dental Hygienists in California

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### Abstract

**Purpose:** The Maslach Burnout Inventory (MBI) quantifies the characteristics of mental and physical exhaustion caused by one's professional life. The purpose of this study was to assess the key occupational factors that may contribute to burnout among dental hygienist members of the California Dental Hygienists' Association as measured by the MBI.

**Methods:** A 36-item electronic survey, consisting of questions assessing burnout, demographic information, clinical care and occupational environment, was sent to dental hygienist members of the California Dental Hygienists' Association (n=2211). Mean scores for each of the burnout subscales (emotional exhaustion-EE, depersonalization-DP, and personal accomplishment-PA) were computed using the MBI manual guidelines, and statistically related to the occupational factors.

**Results:** The response rate was 20.9% (n=443). Thirty percent (30.9%) of respondents reported burnout, as identified by the MBI guidelines; 30.0% of respondents reported high emotional exhaustion (scores  $\geq 27$ ) and 11.3% reported high depersonalization (scores  $\geq 10$ ). Only 41.1% reported low levels of personal accomplishment. Emotional exhaustion and depersonalization decreased with increasing age categories (EE:  $F=5.78, p \leq 0.05$ ; DP:  $F=9.26, p \leq 0.05$ ). Respondents between the ages of 35-44 had the highest levels of emotional exhaustion (EE=24.7) and depersonalization (DP=6.34). Respondents reporting higher levels of self-perceived appreciation in the workplace were more likely to have lower EE and DP scores (EE:  $F=5.12, p \leq 0.05$ ; DP:  $F=8.66, p \leq 0.05$ ).

**Conclusion:** Approximately one-third of the dental hygienists in the sample population experienced burnout. Data indicate the importance of expressing well-deserved appreciation to colleagues and the need to develop educational programs to teach practicing dental hygienists and dental hygiene students strategies to prevent and alleviate the symptoms of stress that often lead to burnout.

**Keywords:** dental hygienists, burnout, stress, emotional exhaustion, depersonalization, personal accomplishment

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### Introduction

Chronic occupational stresses can result in clinical disorders such as burnout.<sup>1,2</sup> The term burnout was first introduced to the scientific literature in 1974 by the American psychologist Herbert J. Freudenberger. Burnout was described as a state of mental and physical exhaustion caused by one's professional life, an outcome specifically related to frontline human service workers.<sup>1,3,4</sup> Shortly after burnout first appeared in the literature, Maslach further defined it as a psychological syndrome and developed the constructs of mental fatigue (emotional exhaustion-EE), negative perceptions and feelings about clients or patients (depersonalization-DP), and negative perceptions of one's self, in relation to job performance (reduced personal accomplishments-PA). These characteristics

formed the current Maslach Burnout Inventory (MBI).<sup>4,5</sup> The MBI categorizes the intensity of burnout into a high and low for each subscale. Burnout scores increase when emotional exhaustion and depersonalization subscale scores are higher and personal accomplishment scores are lower.<sup>5</sup>

The progression of burnout has been described as follows; an initial sign of burnout is emotional and physical exhaustion, with the individual feeling overwhelmed with the demands of work and detached from various aspects of the job.<sup>6</sup> Increased detachment may lead to the dehumanization of patients, as providers stop doing their best and are satisfied with performing the bare minimum.<sup>6</sup> As burnout progresses, the individual develops a lower sense of personal accomplishment and a loss

of self-confidence.<sup>6</sup> Burnout can eventually lead to poor health, addiction, depression, and suicide in some cases.<sup>3,7-9</sup>

Health care workers, who are experiencing burnout, have reported adverse effects on the quality of care and service they render to patients.<sup>4,7-13</sup> Health care, as an industry, places numerous pressures on healthcare providers, including the challenges of clinical work, time constraints, competing demands, lack of control over work processes and scheduling, and conflicting roles and relationships with leadership.<sup>4,7-13</sup> Burnout has been associated with job turnover, absenteeism, low morale, and personal dysfunction in healthcare workers and medical errors.<sup>3,4,10,14</sup> A small, but significant, portion of dentists have been found to be affected by burnout and reports have shown that their workplace environment significantly contributed to their burnout risk.<sup>15-18</sup>

Dental hygiene students have also been reported to be susceptible to burnout.<sup>7</sup> In one study, an estimated 22% of dental hygiene students met the criteria for emotional exhaustion and depersonalization.<sup>7</sup> In another study, dental hygienists were found to experience work overload, conflict, emotional disharmony and hurt while delivering patient care.<sup>19</sup> Dental hygienists, who had reported experiencing a lack of a supportive and protective dental management system and low self-efficacy, had significantly higher levels of burnout.<sup>19</sup> Each of these studies has shown that dental hygienists can be impacted by several occupational factors that negatively affect their well-being. While burnout is known to affect healthcare workers, little has been done to rigorously estimate the scope of burnout within the dental hygiene profession. The purpose of this study was to quantify the distribution of burnout, as identified by the Maslach burnout inventory, and to assess the key occupational factors that may contribute to burnout among dental hygienist members of the California Dental Hygienists' Association (CDHA).

## Methods

This cross-sectional quantitative study, was approved by the Institutional Review Board of The University of California, San Francisco (UCSF) and was conducted using Qualtrics® (Provo, UT, USA), an online survey research software program. Explicit permission was obtained from Mind Garden, Inc. (Menlo Park, CA, USA) for the use of the Maslach Burnout Inventory Human Services Instrument (MBI-HSS), and the authors and the researchers complied with the license and copyright agreements.<sup>5,20</sup> The target population was dental hygienists who were members of the California Dental Hygienists' Association (CDHA) and whose email addresses were available within the CDHA database.

The survey instrument consisted of 36 items in the following domains: the MBI-HSS (22, 7-point Likert scale items), clinical care and occupational environment (8 multiple choice items), and demographic information (6 multiple choice items). The MBI-HSS survey has proven to be a valid and reliable measurement for burnout among dental students and dentists.<sup>21-24</sup> Prior to finalizing survey items, 9 dental hygienists (one enrolled in the UCSF Master of Science in Dental Hygiene program, six UCSF dental hygiene faculty members, one retired clinician, and one full-time clinician) pilot-tested the survey to verify the content and clarity of the survey items. The survey was then revised and finalized based on the results of the feedback. Instructions to the survey stated that participants should respond to the survey items based on if they currently feel or have ever felt this way about their job.

The administration of the CDHA facilitated the recruitment of California dental hygienists by distributing the link to the study, including the informed consent and survey instrument, to all CDHA members whose email addresses were in the CDHA database (n=2100). The first distribution was sent May 4, 2019. Informed consent was implied by the participants responding to the survey items. Participants responded to the survey online and the resultant data were captured using Qualtrics® online survey platform. The CDHA sent a single follow-up email three weeks (May 24, 2019) following the initial request which included a message for participants, who previously had responded, to disregard the notice.

## Data analysis

Descriptive statistical analyses were used to report the frequencies with percent contributions for categorical variables and arithmetic means with standard deviations for continuous variables. Mean scores for each of the burnout (MBI-HSS) subscales have been estimated by calculating the mean value of the total contributing items. The burnout risk in terms of emotional exhaustion (EE), depersonalization (DP), and reduced personal accomplishments (PA) scores were computed by following the MBI manual guidelines.<sup>20, 24</sup> Individuals are considered to have burnout if they have EE scores (27 or higher), DP scores (10 or higher), and a PA score (less than 33).<sup>24</sup> Each of the MBI-HSS continuous subscales were divided into tertiles representing low, moderate and high scores.

To assess whether there was a significant difference between the presence and absence of burnout in reference to each of the demographic variables and professional characteristics, chi-squared tests were utilized for categorical variables and analysis of variance (ANOVA) for continuous variables. In

order to control the type 1 error rate, the Benjamin-Hochberg false discovery rate method was used. All statistical analyses were conducted at the 0.05 significance level and performed using the STATA Statistical Software release 13 (Stata Corp LP; College Station, TX, USA).

## Results

A total of 2,111 electronic surveys were emailed to members of the CDHA whose addresses were in their database; among those, 895 surveys were opened. Four hundred sixty-one members (n=461) responded to the survey, resulting in a response rate of 20.9%. Eighteen surveys were dropped due to excessive missing values yielding a final sample (n=443).

The average age of the respondents was  $50.9 \pm 13.1$  years. Respondents were mainly female, married, and graduated from an associate entry-level dental hygiene program. Almost half the respondents had earned additional degrees, primarily a bachelor's degree (data not shown). The average number of years practicing was  $23.2 \pm 15.4$  years. Most respondents were currently employed in private practice and worked four days a week. The non-clinical respondents were employed primarily at educational institutions and worked 1-3 days. Over half of all respondents perceived being appreciated at work always or most of the time. Respondent demographics are shown in Table I.

The specific survey items for each subscale of the MBI are listed in Table II. According to the MBI guidelines, higher

**Table I. Demographic characteristics (n=426)**

	n	%		n	%
<b>Age, n=417</b>			<b>Days per week practicing clinical dental hygiene, n=375</b>		
22-34	59	14.15	1 to 2	72	19.2
35-44	85	20.40	3 to 4	233	62.13
45-54	80	19.20	5 to 7	70	1.33
55-64	124	29.70	<b>Entry-level dental hygiene education, n=439</b>		
65 and over	69	16.55	Associate Degree	314	71.33
<b>Gender, n=426</b>			Bachelor's Degree	125	28.67
Female	421	98.83	<b>Clinical practice setting, n=405</b>		
Male	5	1.17	Private	343	84.69
<b>Marital status, n=428</b>			Community Health Center	25	6.17
Divorced/Separated	49	11.45	DSO/Corporate	17	4.20
Married/Partner	311	72.66	Academic Institution	20	4.94
Single	61	14.25	<b>Setting of non-clinical dental hygiene position, n=96</b>		
Widowed	7	1.64	Continuing Education	18	18.75
<b>Currently practicing dental hygiene, n=437</b>			Corporate/Private: Administrator	7	7.2
Yes	380	86.96	Educational Institution	54	56.25
No	57	13.04	Oral Health Industry	17	17.70
<b>Years practicing clinical dental hygiene, n=368</b>			<b>Days working in non-clinical position, n=120</b>		
1-5	73	20.38	1-3	77	18.51
6-10	43	51.71	4-7	43	10.34
11-15	35	10.34			
16-20	34	9.5			
20-25	29	8.4			
>25	154	39.77			

**Table II. Maslach Burnout Inventory survey items by subscales\***

Maslach Burnout Inventory Survey Items**	Mean of all Respondents	Standard Deviation
<b>Emotional Exhaustion (EE) Subscale</b>		
1. Emotionally drained from my work	3.74	1.79
2. Used up at the end of the work day	4.11	1.96
3. Fatigued when get up in the morning	3.35	1.94
6. Working with people puts too much stress on me	2.18	1.56
8. Burned out from my work	3.25	1.91
13. Frustrated by my job	3.57	1.90
14. Working too hard on my job	4.06	2.08
16. Working with people all day is a strain	2.59	1.65
20. At the end of my rope	2.24	1.68
<b>Depersonalization (DP) Subscale</b>		
5. Treat patients as impersonal objects	1.58	1.23
10. More callous toward people since I took this job	1.86	1.39
11. Worry that job is hardening me emotionally	1.77	1.47
15. Don't really care what happens to some patients	1.53	1.09
22. Patients blame me for their problems	1.97	1.44
<b>Personal Accomplishment (PA) Subscale</b>		
4. Can easily understand patient's feelings	6.4	1.30
7. Deal effectively with the patients' problems	6.54	1.07
9. Positively influencing people's lives through my work	6.28	1.22
12. Energetic	5.69	1.48
17. Can easily create a relaxed atmosphere for my patients	6.66	0.83
18. Exhilarated after working with patients	5.66	1.66
19. Accomplished worthwhile things in this job	5.84	1.60
21. Deal with emotional problems calmly in my work	6.00	1.58

\*Higher scores for the EE and DP subscales and lower scores for the PA subscale indicate burnout

\*\*Participants were instructed to respond to survey items based on "If you ever feel or felt this way about your job."

scores on the subscale EE and DP and lower scores on the subscale PA are associated with burnout.<sup>11,25</sup> The mean scores and standard deviations of the respondents on the MBI subscales were distributed as follows: (EE 20.0±14.0, DP 3.7±4.7, PA 40.2±7.7). Thirty percent of the respondents were classified as having high emotional exhaustion (mean EE scores 27 or higher), 11.3% of respondents were classified as having high depersonalization (mean DP scores 10 or higher), and 41.1% of respondents were classified as having low personal accomplishment (mean PA scores less than 33) (Table III). Based on the MBI subscales, 30.9% (n=137) of the respondents experienced burnout.

**Table III. Binary distribution of respondents for each subscale and burnout, according to MBI criteria\***

	n	%
<b>Emotional Exhaustion Binary</b>		
Yes (≥ 27)	133	30.02%
No (< 27)	310	69.98%
<b>Depersonalization Binary</b>		
Yes (≥ 10)	50	11.29%
No (< 10)	393	88.71%
<b>Personal Accomplishment Binary</b>		
Yes (< 33)	261	58.92%
No (≥ 33)	182	41.08%
<b>Burnout Binary</b>		
Yes (EE ≥ 27 or DP ≥ 10)	137	30.9%
No (otherwise)	306	69.1%

\*Individuals have at least one symptom of burnout if they have scores in either EE (score of 27 or higher) or DP (score of 10 or higher) subscales

Mean MBI scores were significantly different across the five age categories in the entire study population. The ANOVA F-test showed that emotional exhaustion and depersonalization decreased with increased age (EE: F-test=5.78, p-value=0.0002, DP: F-test=9.26, p-value=0.0001). Bonferroni post hoc tests indicated statistically significant (p<0.05) differences in mean EE scores between the age groups 35 to 44 years (EE=2.3) and 65 to 85 years (EE=1.3), and between the age groups 55-64 years (EE=2.3) and 65 to 85 years (EE=1.3). No significant age differences were identified in personal accomplishment scores. Respondents who

**Table IV. Demographics characteristics of respondents and burnout**

	No Burnout		Burnout		Statistical test,* p-value
	n	%	n	%	
<b>Age</b>					c2 = 19.43, <0.001
<34	33	11.34	26	19.70	
35-44	47	16.15	37	28.03	
45-54	62	21.31	28	21.21	
55-64	95	32.65	28	21.21	
>65	54	18.56	13	9.85	
<b>Marital status</b>					c2 = 2.86, 0.413
Married/Partner	217	73.06	94	71.76	
Divorced/Separated	36	12.12	13	9.92	
Single	41	13.80	20	15.27	
Widowed	3	1.01	4	3.05	
<b>Entry-level education</b>					c2 = 2.72, 0.099
Associate degree	221	73.67	89	65.93	
Bachelor's degree	79	26.33	46	34.07	
<b>Currently practicing</b>					c2 = 0.56, 0.45
Yes	267	88.12	112	85.50	
No	36	11.88	19	14.50	
<b>Years practicing</b>	<b>21.3 yrs</b>	<b>SD = 15.37</b>	<b>20.9</b>	<b>14.14</b>	<b>T=0.26, 0.79</b>
<b>Number of days practicing</b>					c2 = 1.13, 0.566
1 to 2	47	17.94	25	22.12	
3 to 4	167	63.74	66	58.41	
5 to 7	48	18.32	22	19.47	
<b>Clinical setting</b>					c2 = 4.41, 0.220
Academic institution	10	3.83	10	8.77	
Community health center	16	6.13	9	7.89	
DSO/ corporate	12	4.60	5	4.39	
Private practice	223	85.44	90	78.95	
<b>Non-clinical setting</b>					c2 = 4.07, 0.40
Continuing education	12	4.69	6	5.66	
Corporate/private	4	1.56	1	0.94	
Educational institution	33	12.89	21	19.81	
Oral health industry	8	3.12	5	4.72	
<b>Appreciated at work</b>					c2 = 017.31, 0.002
Never	14	4.71	5	3.76	
About half the time	33	11.11	26	19.55	
Sometimes	67	22.56	16	12.03	
Most of the time	139	46.80	52	39.10	
Always	44	14.81	34	25.56	

\*c2= chi-square test; T = student's t-test

often felt appreciated at work were more likely to have lower EE and DP scores (EE: F-test=5.12, p-value=0.0005, DP: F-test=8.66, p-value=0.001). There were no statistically significant differences in EE, DP or PA scores for marital status, currently practicing, years practicing clinical dental hygiene, practice setting, days per week practicing. The sample demographics and burnout/no burnout are shown in Table IV.

## Discussion

This study quantified the distribution of burnout subscales, as identified by the Maslach Burnout Inventory Human Services Instrument (MBI-HSS) and assessed the key occupational factors that may contribute to burnout in dental hygienist members of the CDHA. Burnout was determined by the assessment of the three MBI-HSS subscales: emotional exhaustion (EE), depersonalization (DP) or cynicism, and personal accomplishment (PA) of the respondents. Based on the results, one third of the respondents experienced burnout. The mean scores on the MBI subscales (EE: 19:97, DP:3.65, and PA:40:21) of the respondents in this study were similar to the scores reported in a previous study of nurses (EE:22.0, DP:9.4, and PA:37.0). As the performance of the MBI-HSS items and reliability of the subscales in the multinational nursing study had been validated, the similarity of these data supports the validity of the MBI-HSS research tool in this study.<sup>23</sup>

The EE subscale scores of the respondents in this study and in the study of nurses from eight countries (United States,

Canada, United Kingdom, Germany, New Zealand, Japan, Russia and Armenia) were high and relate to the emotional exhaustion of the respondents. Respondents reported “feeling used up at the end of the day” and “feeling that they work too hard on the job”. Based on their MBI scores, 38% of the first- and second-year dental hygiene students at the Virginia Commonwealth University, also met the criteria for emotional exhaustion and depersonalization.<sup>7</sup>

The respondents’ scores for the subscale DP were lower than expected. Scores were low for questions asking “Do you treat patients as impersonal objects?” and “Do you care what happens to patients?” These findings support a study that also found low depersonalization scores among female health care workers.<sup>26</sup> Females have been reported to be more empathetic towards their patients than males and may avoid burnout by developing coping strategies.<sup>27</sup> Ninety-eight percent of the respondents in this study were female, so it is not unusual that the DP scores in this study were low.

The majority of respondents scored high in the subscale PA. According to Maslach, low, not high, PA indicates burnout.<sup>21,24</sup> Respondents in this study reported that they can easily create a relaxed atmosphere and that they can deal effectively with the patient’s problems. These findings are consistent with research conducted by O’Connor et al., who reported that despite a high level of emotional exhaustion and a moderate level of depersonalization, health care workers reported maintaining a high level of personal accomplishment.<sup>4</sup> Despite feeling exhausted, overextended, depleted and disconnected, they indicated that they still felt competent.<sup>4</sup> Additionally O’Connor et al, found that health care workers with a sense of autonomy and an ability to make their own decisions reported higher levels of personal accomplishment, which may also be related to an association of high personal accomplishment and increased age.<sup>4</sup> Another study by Rada et al. reported that people who display high levels of decisiveness, are self-reliant, maintain high self-worth and have developed good problem-solving and information-seeking skills, cope better under stressful conditions.<sup>2</sup> These attributes would relate to a higher personal accomplishment scores than those indicated for burnout according to the MBI.

Respondents in the older age group experienced less burnout than those in the 35-44 age group in this study. This 35-44 age group, born between 1975 and 1984, may include those in the generation X or the millennial generation, depending upon their position in the age range and the source of dates. Consequently, this age group may have characteristics associated with both generations, such as being independent, flexible, and adapting well to change.<sup>28</sup> Some

of these generational attributes may not work well with a structured dental office environment, such as a preference for managing one’s own time and tasks, and showing less respect for older workers in positions of authority,<sup>28</sup> which may create work-related stressors for the respondents in this age group. This age group may also have more family responsibilities, including child rearing and caring for aging parents, affecting their work/life balance. On the other hand, the respondents aged 65 and older, members of the baby boomer generation, are known to be good team players, with a preference for structure.<sup>28</sup> These characteristics are considered to be more conducive to the dental team relationship and in turn, may minimize work-related stress. Furthermore, these older respondents may have developed coping skills, learning how to adapt to stressful situations through life experiences. Future research could examine the specific stressors for generational age groups and explore their impact on burnout. While some studies have shown that increasing age has a positive effect on dentists’ mental health, resulting in less burnout,<sup>27,29</sup> Gorter reported that high numbers of dentists were leaving the profession and taking early retirement because of work-related stress.<sup>17</sup> Reconciling work-family conflicts have been identified as an important reason for physicians leaving clinical practice.<sup>26</sup>

This study separated the dental hygienists employed in academic or educational institutions into two categories: clinical (patient care) and non-clinical (teaching, research, and administration). As several survey items referred to “patients,” it is unknown how the non-clinical respondents responded to these items. These educators may have responded based upon their interactions with students, patients of the students, or their administrators. Interactions with each of the three would influence or be influenced by the others. Administrators of dental hygiene educational programs have been reported to experience stress and burnout; common stressors were reported to be family responsibilities, administration and faculty conflict, inability to supervise staff, academically struggling students, overwhelming accreditation procedures, heavy teaching or leadership loads and limited resources.<sup>30</sup> Dental hygiene educators, as well as administrators, who are experiencing stress and burnout, may impact the learning environment of their students. Deeb et al. described faculty burnout affecting burnout in students.<sup>7</sup> While the challenges of the dental hygiene curriculum may place students under chronic stress, both students and educators may also be experiencing stress due to personal life events and family demands. These same stressors may affect dental hygiene practitioners, along with the additional demands related to employment, such as issues with bosses, co-workers, and patients. However, dental hygiene

practitioners, who are often older than dental hygiene students, may have developed and refined stress management skills, so the intensity of the stressors may be diminished. The dental workplace environment in Korea was described by Jeung et al., as having rigid rules and greater expectations of employer-employee behaviors, which could be important job stresses, and may be similar to some dental practice environments in the United States.<sup>19</sup>

A major predictor of burnout was lack of appreciation from management. In this study, respondents, who felt appreciated at work more frequently, had less emotional exhaustion and less depersonalization. This finding is consistent with those of Jeung et al., who found that a lack of a protective or supportive management system was a significant predictor of burnout.<sup>19</sup> This also validates the six contributory factors described by Maslach and Leiter: lack of control, personal conflict, insufficient reward, work overload, absence of fairness, and breakdown of community.<sup>6,27</sup> Receiving recognition engages people in their work, and thanking colleagues for their contribution creates a culture of appreciation.<sup>6</sup> Dentists and dental auxiliaries who like each other and work well together, are able to raise each other's stress tolerance levels, resulting in less burnout.<sup>2</sup>

In order to prevent and alleviate burnout, dental hygienists need stress management training.<sup>2,4,6,12</sup> Preventive stress management strategies might include relaxation, health, nutrition, spiritual renewal and financial planning.<sup>4</sup> In a study by Gorter et al., dentists who scored high for burnout on the MBI, enrolled in a program to restore inner balance and develop a personal plan of action.<sup>31</sup> These dentists reduced their levels of burnout and post stress management program scores showed significant improvement on the MBI scales of emotional exhaustion and personal accomplishment.<sup>31</sup> Physical exercise, such as regular walking or working out, burns up the additional supply of adrenaline resulting from stress.<sup>2</sup> These coping strategies increase self-esteem, self-control and self-discipline. Studies have shown that strong positive self-images and knowing how to relax, reduces mental and emotional pressures and the ability to better cope under stressful situations.<sup>2,32</sup>

Burnout has been shown to be a risk factor for patient safety. Studies have demonstrated that health care workers experiencing burnout, can adversely affect the quality of care delivered to patients.<sup>8</sup> The respondents in this study may be experiencing burnout, due to their high scores for emotional exhaustion, but their scores for the depersonalization and personal accomplishment subscales indicate that patient safety may not be a concern in the sample population. In spite of high

emotional exhaustion scores, respondents indicated feeling interested and confident in delivering excellent patient care.

One limitation of this study is the response rate of 20.9%. Low response rates are common in web-based surveys of healthcare professionals, especially those that have been distributed by professional organizations using membership email addresses. Based on a meta-analysis comparing web-based survey response rates to other survey modes, Manfreda and colleagues reported an average of 11% for web-based surveys.<sup>33</sup> While Internet studies have the ease of administration, the lower response rates can contribute to response bias.

Another limitation is the use of a self-reported survey, which can suffer from recall bias and social desirability. Knowledge of the study topic (burnout) may have affected the participants' responses, as well as those who participated. Furthermore, generalizing these data to all California dental hygienists may be compromised by the fact that two of the demographic characteristics of the participants do not appear to be representative of the California dental hygienist population: age and degree granted from their entry-level dental hygiene program. The mean of 50 years may reflect that older dental hygienists have more time to complete surveys or may be more interested in burnout. The mean percentage of respondents graduating from a baccalaureate degree entry-level program was higher than expected, considering that California currently has only three baccalaureate degree programs, and 23 associate degree programs. However, the percentage may be more related to earlier proportions of the two types of programs, considering the mean age of the respondents. Limiting the sample population to CDHA members, also limits the generalizability of the results. Older dental hygienists, who were no longer CDHA members, would not have been included in the study. These individuals may have retired because of burnout.

In spite of these limitations, this study provides a foundation for further studies on burnout in dental hygienists. Surveying different groups separately, such as clinicians working in a dental practice, administrators working in dental hygiene practices, students, and educators, would yield more detailed information about the factors contributing to burnout in the specific group. Using separate sets of survey items, specific to the potential respondents, would avoid the limitation not knowing how non-clinical respondents responded to surveys items referring to patients. Another suggestion would be to use a database of licensed dental hygienists versus one of those belonging to a specific organization, especially if retired or inactive status is included in the database. It would be insightful to determine whether or not the retirement was a result of burnout.

## Conclusion

Based on the findings of this study, dental hygienists are susceptible to burnout, especially to emotional exhaustion. Burnout may have many negative ramifications, both personally and professionally. Dental hygiene students and practicing dental hygienists need to be made aware of the condition and be able to recognize the early signs and symptoms. Educational programs need to be developed, focusing on practices to prevent or alleviate the symptoms of stress, which often lead to burnout. The observed relationship between self-perceived levels of appreciation, emotional exhaustion and depersonalization indicates the need to teach coping behaviors for challenging situations and the importance of expressing well-deserved appreciation to colleagues.

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