Work engagement among Dutch dental hygienists

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Abstract

Objectives: The aim of this study was to investigate the level of work engagement among Dutch dental hygienists.
Methods: A total of 1,520 questionnaires were randomly distributed to the members of the Dutch Dental Hygienists' Association (Nederlandse Vereniging van Mondhygiënisten). The questionnaire consisted of the short form Utrecht Work Engagement Scale, a hypothesized three-factor structure of work engagement (Vigor, Dedication, and Absorption). Participants ranked statements about how they felt at work on 7-point rating scales (0 = never to 6 = always).
Results: From a sample of 490 dental hygienists (32 percent) with a mean age of 38.2 years [standard deviation (SD) = 10.1], the mean level of work engagement was 4.77 (SD = 0.90). The mean score on the dimension of Vigor was 4.74 (SD = 0.74), Dedication was 5.08 (SD = 0.89), and Absorption was 4.48 (SD = 1.12). A significant correlation was found between the dimension Absorption and age ($r = -0.11, P < 0.05$).
Conclusions: Dutch dental hygienists reported a very high level of work engagement. Many dental hygienists experienced high levels of well-being at work at least once a week, with some reporting high levels of well-being on a daily basis. Only a small percentage of dental hygienists reported experiencing very low levels of well-being at work. Dental hygienists also reported significantly higher scores for work engagement and the three dimensions as compared with the manual norms based on a variety of professions. Finally, dental hygienists had higher scores on these questionnaires compared with Dutch dentists.

Introduction

Work engagement and job satisfaction contribute positively to the well-being of workers (1). Globally, high job satisfaction is found among dental hygienists (2-7). Despite this high job satisfaction, dental hygienists often experience work stress because of musculoskeletal pain, difficulty maintaining work–life balance, long work hours, working without assistance, and difficult or demanding patients (8). These external factors are regarded as stressors and are related to burnout. Among other dental practitioners, external hygiene factors such as income or working hours also contributed to negative feelings at work. The correlation between more working hours and increasing age was shown to be a negative factor in job satisfaction (5). This likely influences work engagement negatively, but despite these findings, no recent data are available regarding burnout among (Dutch) dental hygienists (9).

Work engagement is defined as follows: "Engagement is a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (10). Engagement refers to a persistent and pervasive affective–cognitive state. Vigor is characterized by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties. Dedication refers to being strongly involved in one's work and experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge. Absorption is characterized by being fully engaged and happily engrossed in one's work, whereby time passes quickly and one has difficulty detaching oneself from work (11). Work engagement is considered to be the positive opposite of burnout (1). Engaged workers have high energy, are very enthusiastic about their jobs, and become absorbed in their work. These work engagement factors also play a role in intrinsic motivation.

The two-factor theory of job satisfaction makes a distinction between intrinsic motivation (i.e., recognition, responsibility) and extrinsic hygiene factors (i.e., job conditions, salary) (12). In several studies among dental practitioners, the presence of intrinsic motivating factors, such as "opportunity to use abilities," has shown a positive influence on job satisfaction (13). Motivating factors include having responsibilities, variety of work, and opportunity to use abilities, and seeing results of work, recognition of contributions, remuneration, more job experience, higher number of workplaces, work conditions, and good cooperation between coworkers (3,14,15). These motivating factors make a positive contribution to job satisfaction and engagement among oral health professionals (13). However, caries decisive tasks by the Dutch new style dental hygienists may negatively affect job satisfaction because of a lower sense of autonomy in performing such extended tasks (2).

Since the beginning of this century, the Dutch government (16) has focused on task reallocation within the field of oral health care (2,3,6,17). This task reallocation, also described as "redistribution of oral health care among oral health care professionals," has taken place in other countries including the UK. As a consequence of this development, dental hygienists were required to adopt primary oral health care from dentists, such as caries diagnosis and treatment, and to take responsibility for low-risk patients with stable oral health. In line with these changes, the Dutch dental hygiene curricula were expanded by including skills for applied research in addition to tasks that were previously assigned to dentists (2,17). The bachelor/master structure in Dutch higher education provides dental hygienist master's programs with a professional or scientific focus. These programs with scientific focuses offer a relevant step for professional and scientific development from practice-based to evidence-based oral health care. In addition, dental hygienists can perform research in their own professional domain, which contributes to a personal scientific area of expertise (body of knowledge) on which the professional practice of dental hygienists is based (17). Unfortunately, the task reallocation did not lead to enhanced job satisfaction in Dutch dental hygienists, although the level of job satisfaction in this profession is quite high overall (2).

To date, no data are available about the level of work engagement among Dutch dental hygienists. The aim of this study was to investigate the level of work engagement of Dutch dental hygienists using the short form Utrecht Work Engagement Scale-9 (UWES-9). Determining the level of work engagement will provide insight on the three dimensions of work engagement and will indicate the well-being of Dutch dental hygienists at work.

Materials and methods

Permission for this cross-sectional study was obtained from the ethics committee of the Faculty Education of Dental Hygiene, HAN University of Applied Sciences, Nijmegen, the Netherlands, and the study was conducted according to universal ethical principles. Participation of dental hygienists was on a voluntary basis, and confidentiality was assured.

Sample

In the third week of December 2010, a group of 1,520 of a total of over 2,067 members (18) of the Dutch Dental Hygienists' Association [Nederlandse Vereniging van Mondhygiënisten (NVM)] were randomly selected and invited by e-mail to participate in the study. Student NVM members, retired dental hygienists NVM members, NVM members working abroad, and extraordinary NVM members were excluded. The questionnaire was available on the Internet until February 1, 2011. In November and December of 2010, participation announcements were placed on the NVM intranet, in the *Dutch Journal for Dental Hygiene* (*Nederlands Tijdschrift voor Mondhygiëne*), and in an NVM newsletter before data collection.

Questionnaire

The questionnaire consisted of two parts. The first part included demographic questions regarding age, city of education, duration of dental hygiene education in years, work experience in years, and weekly working hours as a dental hygienist. The nominal duration of education was categorized as "2 years," "3 years," "4 years," and "other = additional courses." For dental hygienists in the Netherlands, a "4-year" educational level refers to a bachelor's degree (higher professional and scientific education). Most dental hygienists finish their dental hygiene education at the age of 22 and start retirement between the ages of 60 and 65 (17). Weekly working hours were categorized as "fewer than 8 hours," "9-16 hours," "17-24 hours," "25-32 hours," and "more than 32 hours." These questions and other items were open ended, multiple choice, or to be answered on bipolar adjective rating scales.

Work engagement

Work engagement was measured using the short-form UWES (1). The short-form UWES consists of nine items ($\alpha = 0.92$) grouped into three subscales: Vigor ($\alpha = 0.84$), Dedication ($\alpha = 0.87$), and Absorption ($\alpha = 0.81$). The respondents evaluated their work engagement by rating statements about how they felt at work with 7-point rating scales (i.e., 0 = never to 6 = always). High scores on the full scale and all subscales indicated a high level of work engagement

(1,19,20). Internal consistencies of the full scale and all three subscales deviate only minimally from the UWES-9 manual (i.e., full scale Cronbach's $\alpha = 0.93$; subscales respectively Vigor: $\alpha = 0.84$; Dedication: $\alpha = 0.89$; Absorption: $\alpha = 0.79$) (1).

Statistical analysis

The IBM Statistical Package for Social Sciences 20.0 (SPSS Inc., Chicago, IL, USA) was used for data analysis. The internal consistency of the full scale and all three subscales was computed using Cronbach's alpha. The data were subjected to frequency distributions, and means and standard deviations (SDs) of the subscales were calculated. Interscale correlations on work engagement and variables including age, gender, work experience, and working hours were assessed using Pearson's correlations. Finally, a *t*-test was used to compare the means of two groups (e.g., the manual norm group and the Dutch dentists) (1,20).

Results

Response

After 124 participants were excluded because of incorrect e-mail addresses, 579 of the 1,520 members of the Dutch Dental Hygienists' Association (NVM) approached in the survey (38 percent) responded. After further exclusion for reasons such as incomplete or double-filled questionnaires, a sample of 490 dental hygienists (484 females and six males) remained for data analysis. This number represented a usable response rate of 32 percent.

A comparison with the data from the Dutch Dental Hygienists' Association (NVM database of 2,346 members, accessed January 2013) showed that this sample of 490 NVM members reflects both city of education and duration of dental hygiene education with a margin of 6 percent or less (Table 1).

The age of the participants in this sample was normally distributed, with a mean age of 38.2 years (SD = 10.1), ranging from 22 to 63 years. The three age categories used in this study were "young (22-31 years)," "moderate (32-42 years)," and "old (43-65 years)." Ages formed a distribution of approximately one-third each: 32.2 percent "young," 33.7 percent "moderate," and 34.1 percent "old." A comparison with the Netherlands Institute for Health Services Research (NIVEL) report, including a NVM database of 2,067 members at the beginning of 2010 and a "NIVEL sample" of 1,030 Dutch dental hygienists, showed that the current sample reflects the six categories of age with a margin of 4 percent or less (18). The small differences are because of a natural outflow of dental hygienists over time.

Table 1 Distribution of Two Demographic Variables for the NVM Members in the Study (Sample 2011) Compared with the NVM Database Members (Database 2013)

	Current study (n = 490)	NVM database (n = 2346)
Variable	Percent (%)	Percent (%)
City of education		
Groningen	6.9	9.3
Utrecht	29.8	32.1
Amsterdam	34.7	35.5
Nijmegen	27.8	22.1
"Abroad"	0.8	0.8
Duration of dental hygiene education (years)		
2	38.2	33.2
3	30	35.9
4 + "Other"	31.8	30.9
	(19.6 + 12.2)	(Total: 4 years)

NVM, Nederlandse Vereniging van Mondhygiënisten.

The participants' mean work experience was 15.0 years (SD = 9.6), ranging from 1 to 41 years. Only 1 percent of the dental hygienists worked fewer than 8 hours per week, and almost 9 percent worked 9-16 hours per week. The other three categories of weekly working hours in the sample formed a distribution of approximately 30 percent each: 28.6 percent "17-24 hours," 27.8 percent "25-32 hours," and 33.9 percent "more than 32 hours." This sample is a reasonable reflection of the sample in the NIVEL report (18).

Work engagement and group standardization

For the level of work engagement among the dental hygienists, the means and SDs of the UWES-9 per item are presented in Table 2. In Table 3, the means and SDs of the full scale and the three engagement subscales (i.e., Vigor, Dedication, and Absorption) are presented.

Compared with the manual norms, on the full scale and on the dimensions Vigor, Dedication, and Absorption, significant scores were found among dental hygienists; $t(490) = 19.20$, $P < 0.01$; $t(490) = 13.94$, $P < 0.01$; $t(490) = 19.05$, $P < 0.01$, and $t(490) = 18.61$, $P < 0.01$, respectively. By conventional criteria for effect sizes, these differences are considered to be extremely high compared with the manual norms based upon a variety of professions (21). In comparison with work engagement among Dutch dentists (19), which was measured using the 15-item version of the UWES (1), dental hygienists had a significantly higher score on Vigor, Dedication, and Absorption [$t(490) = 11.9$, $P < 0.01$, $t(490) = 12.23$, $P < 0.01$, and $t(490) = 8.79$, $P < 0.01$, respectively]. Notably, these differences between dental hygienists and dentists are also considered to be extremely high (21).

Table 2 UWES-9: M Scores and SDs per Item, $n = 490$

	Almost never	Rarely	Sometimes	Often	Very often	Always
0	1	2	3	4	5	6
Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day
Items					Mean	SD
At my work, I feel bursting with energy (Vigor)					4.84	1.04
At my job, I feel strong and vigorous (Vigor)					4.81	0.99
I am enthusiastic about my job (Dedication)					4.58	1.20
My job inspires me (Dedication)					5.11	0,93
When I get up in the morning, I feel like going to work (Vigor)					4.88	1.11
I feel happy when I am working intensely (Absorption)					5.25	0.93
I am proud of the work that I do (Dedication)					4.72	1.12
I am immersed in my work (Absorption)					4.74	1.16
I get carried away when I'm working (Absorption)					3.97	1.60

M, mean; SD, standard deviation; UWES-9, Utrecht Work Engagement Scale-9.

Work engagement and individual standardization

To present the individual standardization in percentages, the scores on the UWES-9 and subscales were recoded into three categories: "low," "moderate," and "high" level of work engagement (Table 4).

More than half of the dental hygienists in this study reported a high level of work engagement. Many dental hygienists experienced a high level of well-being at work at least once a week to daily. Based on the mean score on the dimension Vigor (see Table 4), 38 percent of the participants indicated a moderate level of work engagement. Overall, approximately one-third of the participants reported that they felt satisfied at work a few times a month or less. Seven percent of the dental hygienists reported experiencing low levels of well-being at work.

Work engagement and age, work experience, working hours, and gender

A significant negative correlation was found between the subscale Absorption and mean age ($r = -0.11, P < 0.05$), indicating a loss of work engagement with increased age. This

Table 3 M Scores and SDs on the UWES-9 and on the Three Engagement Subscales for Dental Hygienists Compared with the Manual Norm Scores UWES-9 and the UWES-15 Scores for Dutch Dentists (1,18)

	Current study ($n = 490$)		UWES-9 manual ($n = 9679$)		UWES-15 dentists ($n = 491$)	
	Mean	SD	Mean	SD	Mean	SD
UWES-9*	4.77	0.90	3.74	1.17	–	
Vigor*†	4.74	0.94	4.01	1.14	3.95	1.13
Dedication*†	5.08	0.89	3.88	1.38	4.32	1.09
Absorption*†	4.48	1.12	3.35	1.32	3.86	1.09

* Significantly different from norm scores ($P < 0.01$).

† Significantly different from Dutch dentists ($P < 0.01$).

M, mean; SD, standard deviation; UWES, Utrecht Work Engagement Scale.

Table 4 Individual Standardization per Category in Percent on the UWES-9 and on the Three Engagement Subscales for Dental Hygienists Compared with the Manual Norm Scores UWES-9

	Vigor		Dedication		Absorption		Total score	
	Current study in % ($n = 490$)	UWES-9 manual norm scores ($n = 9679$)	Current study in % ($n = 490$)	UWES-9 manual norm scores ($n = 9679$)	Current study in % ($n = 490$)	UWES-9 manual norm scores ($n = 9679$)	Current study in % ($n = 490$)	UWES-9 manual norm scores ($n = 9679$)
Low	7.1	<3.26	2.0	<2.91	4.4	<2.34	4.3	<2.89
Moderate	38.4	3.26-4.80	28.8	2.91-4.71	27.6	2.34-4.21	32.8	2.89-4.67
High	54.5	>4.80	69.2	>4.71	68.0	>4.21	62.9	>4.67

UWES, Utrecht Work Engagement Scale.

finding is not surprising, as the older participants had often followed a 2-year program, and a significant correlation between the subscale Absorption and the 2-year program was found ($r = -0.12$, $P < 0.01$). Similarly, a significant correlation was found between the subscale Absorption and work experience ($r = -0.11$, $P < 0.05$).

Significant correlations between the two subscales Dedication and Absorption and weekly working hours were found ($r = 0.14$, $P < 0.01$ and $r = 0.16$, $P < 0.01$, respectively). These correlations were positive, indicating an enhanced level of work engagement with more working hours per week on Dedication and Absorption, but not for Vigor. Gender differences were not examined because there were very few male respondents in the present study, and, as mentioned in the manual (1), only very small differences typically exist between the mean scores of male and female respondents.

Discussion

The aim of the study was to investigate the level of work engagement among dental hygienists in the Netherlands using the UWES. Unfortunately, a response rate of 32 percent is not extremely high, but as recommended, no special steps were taken to maximize response rates (22). Unlike in New Zealand and the UK, no data are available in the Netherlands on the phenomenon of high rates of career breaks among dental hygienists (4). This phenomenon may explain the lower response rate.

However, this percentage can be regarded as being consistent with other internet-based survey studies among dental hygienists or dentists in the Netherlands. First, this sample of respondents is not only representative of the profession of Dutch dental hygienists on the variable "age percentages" (18) but also on the variables "city of education" and "duration of dental hygiene education" (the NVM member database 2013 has a unity of density of 75 percent). Second, given the high Cronbach's alpha and the preference found in subscales, the psychometric properties of the Dutch short-form UWES among dental hygienists were fairly consistent with those reported in the manual (1). Third, the level of work engagement among Dutch dental hygienists is very high, and they have positive working attitudes. They experience a high level of well-being at work, and because of their highly intrinsic motivation, they may act as role models for preventive oral health care interventions tailored for partners, children, and peer groups of the same sex and younger age (23). Furthermore, oral health professionals and dental/oral hygienists as paramedic professionals in particular are preventive specialists of oral health with a principal responsibility for maintaining a healthy mouth and surrounding orofacial area. Beyond providing oral health care, oral hygienists and dentists are considered to be "oral physicians" and are expected to emphasize and integrate the correlation between oral and systemic disease as contributors to overall health care and quality of life of their patients (24). Earlier findings from several studies also showed a high level of job satisfaction in the dental hygienist profession (2-7). However, in contrast to an earlier Dutch study (2), in the present study, less job satisfaction was not found among the dental/oral hygienist profession with a "4-year" educational level. Although not investigated in the present study, one explanation for this phenomenon could be that extending the duties of this subgroup of dental hygienists might increase their degree of work engagement. Findings from a study performed in the UK showed that work engagement was related to postgraduate qualification, working in small teams, and the system of remuneration (25,26). Regarding the current work situation for Dutch dental hygienists (17), an explanation for low perceived job satisfaction (2) and an extremely high level of work engagement among this sample of young professionals could be the phenomena designated as "relative deprivation" (27). In other words, subjective job dissatisfaction is not caused by an objective work situation, but rather by the relative position as compared with the work situation of another individual.

Remarkably, a negative correlation between Absorption and age (2-year educational program and work experience in years) was found. This result can be explained by the decreasing level of absorption with increasing age. It was also found that Dutch dental hygienists had fewer working hours as their age increased. Although more working hours are negatively correlated with increased age for job satisfaction (5), and the UWES manual (1) reported that higher age is associated with higher levels of work engagement, particularly for the subscale Absorption ($r = 0.17$), the findings from this study showed a trend of declining work engagement with increased age (2-year program and work experience in years). This finding, together with a generally high level of work engagement, can presumably be explained by a selection effect. It is possible that the profession of Dutch dental hygienists consists of young professionals with a high turnover of those who are less "engaged" and leave their profession (4,25), whereas the real "engaged" dental hygienists continue to work. Other explanations could be more socially desirable: the SDs of the mean scores of dental hygienists are much lower in comparison with the SDs of the manual and the Dutch dentists' mean scores. A possible limitation of the present research is that for the comparison with the sample of dentists, the UWES-9 version administered to dental hygienists was compared with the UWES-15 version administered to dentists. However, all items measured the same underlying constructs of work engagement, and the UWES versions are considered to be equivalent. Moreover, the dental hygienists who participated in this study may be characterized by a relatively high degree of involvement and engagement. Apparently, the dental hygienists "agree more," which was indicated by less variance around the average. Further research on this issue in other

countries is essential, as this study was restricted to the working situation of Dutch dental hygienists who were required to take responsibility for low-risk patients with stable oral health.

More research is also needed to gain further information about the influence of reallocation of tasks. Redistribution of oral health care among oral health care professionals is also described as care shift, "from cure to care and the importance of oral health in relation to general health," and may affect the level of work engagement among dental hygienists. This phenomenon also applies to other paramedic professions where such task reallocation or redistribution of health care among health care professionals takes place, such as the nurse practitioner profession. Additional research is needed to extend the knowledge of work engagement in general and in relation to "relative deprivation" and/or burnout, although according to the results of this study, anticipating burnout among dental hygienists is likely difficult (9).

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References

1. Schaufeli WB, Bakker AB, Salanova M. The measurement of work engagement with a short questionnaire: a cross-national study. *Educ Psychol Meas*. 2006;**66**:701-16.
2. Jerković-Ćosić K, van Offenbroek MAG, van der Schans CP. Job satisfaction and job content in Dutch dental hygienists. *Int J Dent Hyg*. 2012;**10**:155-62.
3. Turner S, Ross MK, Ibbetson J. Job satisfaction among dually qualified dental hygienist-therapists in UK primary care: a structural model. *Br Dent J*. 2011;**210**:1-7.
4. Ayers KMS, Meldrum AM, Thomson WM, Newton JT. The working practices and job satisfaction of dental hygienists in New Zealand. *J Public Health Dent*. 2006;**66**(3):186-91.
5. Hopcraft M, McNully C, Ng C, Pek L, Pham TA, Phoon WL, Poursoltan P, Yu W. Attitudes of the Victorian oral health workforce on the employment and scope of practice of dental hygienists. *Aust Dent J*. 2008;**53**:67-73.
6. Gibbons DE, Corrigan M, Newton JT. A national survey of dental hygienist: working pattern and job satisfaction. *Br Dent J*. 2001;**190**:207-10.
7. Ylippää V, Arnetz BB, Preber H, Benkö SS. Determinants of work satisfaction among Swedish dental hygienists. *Scand J Caring Sci*. 1996;**10**(4):247-53.
8. Ylippää V, Szuster F, Spencer J, Preber H, Sandelin Benkö S, Arnetz BB. Health, mental well-being, and musculoskeletal disorders: a comparison between Swedish and Australian dental hygienists. *J Dent Hyg*. 2002;**76**(1):47-58.
9. Gorter RC. Work stress and burnout among dental hygienists. *Int J Dent Hyg*. 2005;**3**:88-92.
10. Schaufeli WB, Salanova M, Gonzalez-Roma V, Bakker AB. The measurement of engagement and burnout and: a confirmative analytic approach. *J Happiness Stud*. 2002a;**3**: 71-92.
11. Maslach C, Schaufeli WB, Leiter MP. Job burnout. *Annu Rev Psychol*. 2001;**52**:397-422.
12. Herzberg F, Mausner B, Snydermann BB. *The motivation to work*. 2nd ed. New York: John Wiley & Sons Inc.; 1967.
13. Goetz K, Campbell SM, Broge B, Dörfer CE, Brodowski M, Szecsenyi J. The impact of intrinsic and extrinsic factors on the job satisfaction of dentists. *Community Dent Oral Epidemiol*. 2012;**40**:474-80.
14. Yavnai N, Bilder L, Sgan-Cohen H, Zini A. Dental hygienists in Israel: employment evaluation, job satisfaction, and training implications. *Int Dent Educ*. 2012;**76**(10):1371-6.
15. Candell A, Engström M. Dental hygienists' work environment: motivating, facilitating, but also trying. *Int J Dent Hyg*. 2010;**8**:204-12.
16. Commisie Lapré. *Eindrapport van de adviescommissie capaciteit mondzorg*. The Hague: Ministerie van Volksgezondheid, Welzijn en Sport; 2000.
17. Jongbloed-Zoet C, Bol-van den Hil EM, La Rivière-Ilsen J, van der Sanden-Stoelinga MSE. Dental hygienists in the Netherlands: the past, present and future. *Int J Dent Hyg*. 2012;**10**:148-54.
18. Schepman MS, Kalf RRJ, Batenburg RS Actuele gegevens over het arbeidsaanbod van mondhygiënisten in Nederland. [Current data of on the labor supply of dental hygienists in the Netherlands]. Utrecht: NIVEL, 2010.
19. Gorter RC, te Brake HJHM, Hoogstraten J, Eijckman MAJ. Positive engagement and job resources in dental practice. *Community Dent Oral Epidemiol*. 2008;**36**:47-54.
20. Te Brake JHM, Bouman A-M, Gorter R, Hoogstraten J, Eijkman M. Professional burnout and work engagement among dentists. *Euro J Oral Sci*. 2007;**115**:180-5.
21. Cohen J. *Statistical power analysis for the behavioral sciences*. 2nd ed. Hillsdale: Erlbaum; 1988.
22. Dillman DA, Smyth JD, Chrisitan LM. *Internet, mail, and mixed-mode surveys: the tailored design method*. Chichester: John Wiley & Sons; 2008.
23. Buunk-Werkhoven YAB, Dijkstra A. Gender variations in oral hygiene behaviour and expected social outcomes. Abstracts for the International Symposium on Dental Hygiene, Cape Town, South Africa, August 14-17, 2013. *Int J Dent Hygiene*. 2013;**11**:156-73. doi: 10.1111/idh.12034.
24. Giddon DB, Hertzman-Miller R. *Behavioral dentistry*. 2nd ed. Mostofsky DI, Fortune F, editors. Malden, MA: John Wiley & Sons, Inc; 2014.

25. Denton D, Newton JT, Bower EJ. Occupational burnout and work engagement: a national survey of dentists in the United Kingdom. *Br Dent J*. 2008;**205**:E13.
26. Gallagher JE, Patel R, Wilson NHF. The emerging dental workforce: long-term career expectations and influences. A quantitative study of final year dental students' views on their long-term career from one London Dental School. *BMC Oral Health*. 2009;**9**:35. doi: 10.1186/1472-6831-9-35.
27. Buunk AP, Zurriaga R, Gonzales-Roma V, Subirats M. Engaging in up-wards and down-wards comparison as a determinant of relative deprivation at work: a longitudinal study. *J Vocat Behav*. 2003;**62**:370-88.

