



Original Article

Work stress and occupational burnout among dental staff in a medical center



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KEYWORDS

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Abstract *Background/purpose:* Research on work stress and occupational burnout among Taiwanese dental staff is scarce. Thus, this study aimed to explore work stress and occupational burnout among dental staff in a medical center.

Materials and methods: This study is a cross-sectional survey that included the dental staff of a medical center in Taiwan. They were asked to complete self-reported questionnaires anonymously. The Questionnaire on Medical Workers' Stress (QMWS) was used to assess work stress, and the Maslach Burnout Inventory-Human Service Survey (MBI-HSS) was used to evaluate occupational burnout. In total, 108 valid questionnaires were collected, with a response rate of 79.9%. Data were analyzed using independent *t*-tests, one-way analysis of variance, Pearson's correlation, and stepwise linear regression.

Results: Overall QMWS score indicated that visiting staff perceived significantly higher stress than post-graduate year residents. Average scores of MBI-HSS showed dental assistants' scores as similar to those of high burnout groups; visiting staff and moderate burnout groups had similar scores. Stepwise regression analyses revealed that the significant predictor of emotional exhaustion was the QMWS score, of depersonalization were working as a dental assistant and QMWS score, and of personal accomplishment was holding a teaching position.

Conclusion: Work stress and occupational burnout were common among dental staff; this may affect patient safety and should be valued. A stress management program is recommended to promote mental health of dental staff, along with adjustment of working environment, performance evaluation, and promotion systems.

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Introduction

National Health Insurance (NHI) in Taiwan was implemented in 1995, and in 1998 the Global Budget System on dental claims was established; both institutions had great impact on dental organizations and professionals.¹ Dental treatment duration is often longer than that of general medical treatment; therefore, under the government regulation, about 90% of dental institutions have been established as clinics.² The number of dental clinics increased from 6513 in 2012–6811 in 2017, with a growth rate of 4.6% in five years, and the number of dentists increased from 12,391 to 14,380 with a growth rate of 16.1%, which was four times faster than the growth of dental institutions.² Dentistry graduates were regulated to be trained in different authorized hospitals to improve their basic clinical abilities, and the two-year Post-Graduate Year program (PGY) was implemented in 2010.³ University hospitals have been positioned as research excellence centers, and academic achievement has become an important factor in evaluating the performance of senior dentists in medical centers.

Under the global budget payment system, previous studies have reported that “managing medical disputes or lawsuits,” “preparing the hospital for accreditation,” and “seeking a job promotion or doing academic research” were the main stressors among clinical nurses and medical technologists.^{4,5} For occupational and physical therapists, the main stressors were “managing medical disputes or lawsuits,” “salary payment system,” and “preparing the hospital for accreditation.”⁶ For pharmacists, “managing medical disputes or lawsuits” and “preparing the hospital for accreditation” were the first stressors.⁷ For primary dentists and Chinese medical doctors, the main stressors were “managing medical disputes or lawsuits” and “running the hospital.”⁸

Burnout is a syndrome characterized by emotional exhaustion and cynicism that occurs frequently among individuals who do “people work” of some kind. A key aspect of the burnout syndrome is increased feelings of emotional exhaustion (EE). Another aspect is developing negative, cynical attitudes and feelings about one’s clients (depersonalization; DP). A third aspect of the burnout syndrome is the tendency to evaluate oneself negatively, particularly regarding one’s work with clients (personal accomplishment; PA).⁹ The most widely used measurement of burnout among human services occupations is the Maslach Burnout Inventory-Human Services Survey (MBI-HSS), which is utilized to assess EE, DP, and PA.¹⁰ More than 10 years ago, a study of primary dentists reported that being female, younger, single, and working as a resident doctor were associated with poorer stress adaptation and more severe occupational burnout; besides, occupational stress was positively related to EE.¹¹ Another research reported that dental assistants perceived high work stress, high job

satisfaction, and low occupational burnout.¹² Recently, a study carried out on primary dentists reported that work stress, marital status, monthly pay, and salary satisfaction were associated with EE, marital status was a predictor of DP, and EE a predictor of quit intention.¹³

However, studies on work stress and burnout among Taiwanese dental staff are rare, and samples of previous studies have been mainly focused on clinical staff. Dental staff in medical centers is responsible for patient care, teaching, and researching. This study aimed to explore the level of work stress and occupational burnout among dental staff in a medical center.

Materials and methods

Participants and setting

This study is a cross-sectional survey; participants were members of a dental staff from a medical center in Taiwan. The research was conducted from July 2017 to January 2018. A total of 121 dental staff members completed the questionnaires, with a response rate of 79.9%. Among them, there were 24 Post-Graduate Year program participants (PGY) who had the highest response rate (96.0%), followed by 22 residents (R; response rate = 84.6%), 37 dental assistants (DA; response rate = 80.4%), and 28 visiting staff (VS; response rate = 66.7%). Two participants were excluded because they had less than one year of seniority, and another participant due to response bias. Finally, 108 participants were included in this study.

Measures

The self-reported structured survey consisted of demographic data, working conditions, and two instruments: Questionnaire on Medical Workers’ Stress (QMWS) and Maslach Burnout Inventory-Human Service Survey (MBI-HSS).

1. Questionnaire on Medical Workers’ Stress (QMWS)

The instrument was developed by See et al. (2007) based on the working environment of Taiwanese medical professionals and was designed to evaluate medical workers’ perceived stress to various specific stressors.¹⁴ The scale has satisfactory reliability and validity; it comprises eight items, including “running the hospital,” “preparing the hospital for accreditation,” “maintaining patients’ disease conditions,” “maintaining a good relationship with patients,” “managing medical disputes or lawsuits,” “salary payment system,” “job performance evaluation system,” and “seeking a job promotion or doing academic research.” Each item is rated in a 6-point Likert scale ranging from 1

(very sure it is not stressful) to 6 (very sure it is stressful), and the total score ranges from 8 to 42; higher scores represent higher perceived stress of medical work. Cronbach's α in this study sample was 0.844.

2. Maslach Burnout Inventory-Human Service Survey (MBI-HSS)

This instrument was developed by Maslach & Jackson (1996), and was designed to measure burnout in a variety of human services occupations. The scale contains 22 items, each rated in a 7-point Likert scale ranging from 0 (never) to 6 (every day). The MBI-HSS consists of three dimensions: (1) emotional exhaustion (EE): nine items, the sum score ranges from 0 to 54, higher scores represent more severe EE which indicates higher occupational burnout; (2) depersonalization (DP): five items, the sum score ranges from 0 to 30, higher scores represent more severe DP which indicates higher occupational burnout; and (3) personal accomplishment (PA): eight items, the sum score ranges from 0 to 48, lower scores represent more powerless from work.¹⁰ The Chinese version of the MBI-HSS has been used in previous studies on dental staff and reported acceptable Cronbach's α coefficients (0.68–0.89).^{11–13} Lee et al. (2013) conducted a study to examine the factor structure of the Chinese version of MBI-HSS based on a sample of nurses suggesting a modified version of 20 items.¹⁵ This study adopted the original 22-item version, and Cronbach's α coefficients were 0.944, 0.934, and 0.490 for EE, DP, and PA, respectively; after excluding three items from the PA scale, Cronbach's α changed to 0.856. Therefore, this study adopted a 5-item PA sum score which ranged from 0 to 30.

Data analysis

Data were analyzed using SPSS statistical software, version 22.0. Descriptive analyses were used to describe sample characteristics, sum score of QMWS, and subscale scores of MBI-HSS. Independent sample *t*-tests and one-way ANOVA were used to determine the differences between basic characteristics in mean total scores of QMWS and subscales of MBI-HSS. Pearson's correlation coefficients were calculated for QMWS and subscales of MBI-HSS. Stepwise regression analyses were utilized to identify the predictors of EE, DP, and PA.

Results

Sample characteristics

This sample's most frequent job category was DA ($n = 35$, 32.4%), followed by VS ($n = 27$, 25.0%), PGY ($n = 24$, 22.2%), and R ($n = 22$, 20.4%). Among them, 61.1% were female ($n = 66$); most participants had a bachelor degree ($n = 67$, 62.0%), 19 (17.6%) a master's degree, four (3.7%) were studying a master's degree, eight (7.4%) had a PhD, five (4.6%) were obtaining a PhD, three (2.8%) had an associate degree, and two (1.9%) technical or training certificate. A total of 10 participants (9.3%) had a teaching position and 19 (17.6%) held management positions.

Regarding age, most participants were less than 29 years ($n = 55$, 50.9%), followed by participants between 30 and 39 years ($n = 34$, 31.5%), and those above 40 years ($n = 19$, 17.6%). Regarding seniority, the most frequent group was less than nine years ($n = 75$, 69.4%), followed by 10–19 years ($n = 24$, 22.2%), and more than 20 years ($n = 9$, 8.3%). Most participants reported that their salary was "acceptable" ($n = 67$, 62.0%), while 24 participants (22.2%) felt "satisfied", and 17 (15.7%) reported being "unsatisfied" with their salary.

Dental workers' stress

The average scores of each QMWS item revealed that the most stressful item was "managing medical disputes or lawsuits" (mean = 4.39, SD = 1.34), followed by "preparing the hospital for accreditation" (mean = 4.27, SD = 1.30), and "seeking a job promotion or doing academic research" (mean = 3.98, SD = 1.35). Average scores of other items were between 3 and 4, and the average total score was 30.81 (SD = 6.84), ranging from 14 to 48.

Comparing average scores of QMWS items with the sample characteristics and working conditions (Table 1), this study found that for the item "running the hospital," VS perceived significantly more stress than PGY ($F_{3,104} = 4.636$, $P = 0.004$); participants who had a teaching ($t = 2.200$, $P = 0.030$) or management position ($t = 2.650$, $P = 0.009$) perceived significantly higher stress; those participants who were older than 40 years perceived significantly more stress than participants aged less than 29 years ($F_{2,105} = 5.174$, $P = 0.007$); finally, senior staff (seniority of more than 20 years) perceived significantly more stress than junior staff (seniority of less than nine years) ($F_{2,105} = 4.494$, $P = 0.013$).

On the item "preparing the hospital for accreditation," VS, R, and DA perceived significantly higher stress than PGY ($F_{3,104} = 9.337$, $P < 0.001$); participants in the age groups of 30–39 years and more than 40 years perceived significantly more stress than those in the age group of less than 29 years ($F_{2,105} = 6.226$, $P = 0.003$). On the item "maintaining patients' disease conditions," female staff perceived significantly higher stress ($t = 2.172$, $P = 0.032$). The items "maintaining a good relationship with patients," "managing medical disputes or lawsuits," and "salary payment system" showed non-significant differences based on sample characteristics. On the item "job performance evaluation system," VS perceived significantly more stress than PGY ($F_{3,104} = 2.831$, $P = 0.042$).

On the item "seeking a job promotion or doing academic research," VS perceived significantly higher stress than PGY and DA ($F_{3,104} = 7.064$, $P < 0.001$); participants who had a teaching position perceived significantly higher stress ($t = 2.048$, $P = 0.043$) as well as participants who had an MD or PhD ($F_{2,105} = 7.340$, $P = 0.001$); those who were over 40 years old perceived significantly more stress than participants younger than 29 years ($F_{2,105} = 7.437$, $P = 0.001$); senior staff (seniority of more than 20 years) perceived significantly more stress than junior staff ($F_{2,105} = 6.654$, $P = 0.002$). Finally, the overall QMWS score indicated that VS perceived significantly higher stress than PGY ($F_{3,104} = 3.078$, $P = 0.031$).

Table 1 Work stress among dental staff.

Variables	n	1. Running the hospital	2. Preparing the hospital for accreditation	3. Maintaining patients' disease conditions	4. Maintaining a good relationship with patients	5. Managing medical disputes or lawsuits
Job category						
PGY	24	2.75 ± 1.189b	3.17 ± 1.239b	3.88 ± 1.296	3.79 ± 1.318	4.04 ± 1.367
R	22	3.68 ± 1.086	4.50 ± 1.058a	3.82 ± 0.907	3.68 ± 0.894	4.50 ± 1.102
VS	27	4.00 ± 1.109a	4.74 ± 1.163a	3.74 ± 1.196	3.52 ± 1.156	4.63 ± 1.391
DA	35	3.37 ± 1.437	4.51 ± 1.197a	3.91 ± 1.173	3.43 ± 1.461	4.37 ± 1.416
Gender						
Female	66	3.47 ± 1.280	4.38 ± 1.212	4.03 ± 1.067a	3.67 ± 1.269	4.45 ± 1.349
Male	42	3.43 ± 1.346	4.10 ± 1.428	3.55 ± 1.214b	3.45 ± 1.214	4.29 ± 1.330
Teaching position						
Yes	10	4.30 ± 0.823a	4.60 ± 0.966	4.10 ± 1.101	3.90 ± 1.370	4.50 ± 1.509
No	98	3.37 ± 1.311b	4.23 ± 1.330	3.82 ± 1.152	3.55 ± 1.236	4.38 ± 1.328
Management position						
Yes	19	4.16 ± 1.015a	4.58 ± 1.017	3.79 ± 1.357	3.58 ± 1.387	4.47 ± 1.679
No	88	3.31 ± 1.316b	4.22 ± 1.351	3.86 ± 1.106	3.59 ± 1.228	4.40 ± 1.246
Educational level						
University or below	72	3.28 ± 1.201	4.07 ± 1.304	3.89 ± 1.095	3.60 ± 1.241	4.38 ± 1.227
Graduate or PhD student	9	3.67 ± 1.323	4.56 ± 1.014	3.78 ± 0.927	3.78 ± 1.202	4.33 ± 1.414
MD or PhD	27	3.85 ± 1.486	4.70 ± 1.295	3.74 ± 1.347	3.48 ± 1.312	4.44 ± 1.625
Age group						
≤29 years	55	3.09 ± 1.236b	3.85 ± 1.208b	4.00 ± 1.106	3.82 ± 1.203	4.18 ± 1.249
30–39 years	34	3.71 ± 1.292	4.71 ± 1.360a	3.65 ± 1.203	3.26 ± 1.238	4.59 ± 1.395
≥40 years	19	4.05 ± 1.224a	4.68 ± 1.108a	3.74 ± 1.147	3.47 ± 1.307	4.63 ± 1.461
Seniority						
≤9 years	75	3.27 ± 1.234b	4.12 ± 1.284	3.92 ± 1.075	3.72 ± 1.097	4.29 ± 1.260
10–19 years	24	3.63 ± 1.408	4.46 ± 1.318	3.63 ± 1.345	3.17 ± 1.579	4.54 ± 1.474
≥20 years	9	4.56 ± 1.014a	5.00 ± 1.225	3.78 ± 1.202	3.56 ± 1.333	4.78 ± 1.641
Variables	n	6. Salary payment system	7. Job performance evaluation system	8. Seeking a job promotion or doing academic research	QMWS	
Job category						
PGY	24	3.50 ± 1.216	3.25 ± 1.260b	3.25 ± 1.391b	27.63 ± 7.377b	
R	22	3.55 ± 0.739	3.64 ± 0.848	4.05 ± 0.999	31.41 ± 5.869	
VS	27	3.67 ± 1.271	4.11 ± 1.050a	4.81 ± 1.241a	33.22 ± 6.919a	
DA	35	3.57 ± 1.092	3.77 ± 1.060	3.80 ± 1.279b	30.74 ± 6.377	
Gender						
Female	66	3.53 ± 1.011	3.68 ± 1.010	3.94 ± 1.251	31.15 ± 6.082	
Male	42	3.64 ± 1.226	3.76 ± 1.226	4.05 ± 1.497	30.26 ± 7.942	
Teaching position						
Yes	10	3.70 ± 1.418	4.30 ± 1.059	4.80 ± 1.398a	34.20 ± 8.404	
No	98	3.56 ± 1.066	3.65 ± 1.085	3.90 ± 1.320b	30.46 ± 6.618	
Management position						
Yes	19	3.53 ± 1.073	4.00 ± 0.943	4.47 ± 1.307	32.58 ± 7.784	
No	88	3.59 ± 1.110	3.65 ± 1.125	3.88 ± 1.346	30.49 ± 6.625	
Educational level						
University or below	72	3.56 ± 1.086	3.61 ± 1.082	3.65 ± 1.258b	30.03 ± 6.505	
Graduate or PhD student	9	3.78 ± 1.202	4.11 ± 0.782	4.44 ± 1.236	32.44 ± 7.055	
MD or PhD	27	3.56 ± 1.121	3.85 ± 1.199	4.70 ± 1.325a	32.33 ± 7.540	
Age group						
≤29 years	55	3.53 ± 0.997	3.49 ± 1.052	3.53 ± 1.168b	29.49 ± 6.495	
30–39 years	34	3.68 ± 1.199	3.85 ± 1.105	4.35 ± 1.300	31.79 ± 6.848	
≥40 years	19	3.53 ± 1.219	4.11 ± 1.100	4.63 ± 1.499a	32.84 ± 7.373	
Seniority						
≤9 years	75	3.56 ± 1.068	3.65 ± 1.059	3.75 ± 1.253b	30.28 ± 6.432	
10–19 years	24	3.71 ± 1.122	3.63 ± 1.173	4.21 ± 1.414b	30.96 ± 7.527	
≥20 years	9	3.33 ± 1.323	4.44 ± 1.014	5.33 ± 1.118a	34.78 ± 7.775	

Note: a significantly higher than b.

Occupational burnout

The average EE score of MBI-HSS was 26.31 (SD = 12.32), ranging from 2 to 52; DP average score was 9.60 (SD = 7.44), ranging from 0 to 29; and PA average score was 19.23 (SD = 6.09), ranging from 5 to 30. Comparing average scores of MBI-HSS subscales with the sample characteristics and working conditions (Table 2), this study found that participants who were unsatisfied with the salary perceived significantly higher EE ($F_{2,105} = 3.531$, $P = 0.033$); DA perceived significantly higher DP than VS ($F_{3,104} = 3.828$, $P = 0.012$); participants who had a teaching position perceived significantly higher PA ($t = 3.540$, $P = 0.001$) as well as those who have an MD or PhD degree, compared to other educational levels ($F_{2,104} = 3.806$, $P = 0.025$).

Predictors of occupational burnout

Pearson correlation coefficients revealed that QMWS was positively correlated with EE ($r = 0.454$, $P = 0.000$) and DP ($r = 0.287$, $P = 0.004$); EE and DP were positively correlated as well ($r = 0.629$, $P = 0.000$). In the first regression analysis, EE was used as the dependent variable, and other variables that statistically significantly related to the EE score (satisfaction with salary and QMWS) were used as the

independent variables. After performing stepwise regression with forward selection, the significant predictor of EE was QMWS. The second regression analysis used DP as the dependent variable, and job category and QMWS as independent variables, revealing that significant predictors of DP were DA and QMWS. The third regression analysis used PA as the dependent variable, and teaching position and educational level as independent variables, showing that the significant predictor of PA was teaching position (Table 3).

Discussion

This research found that “managing medical disputes or lawsuits” was the most stressful item for dental staff, regardless of job category. The result is consistent with previous studies where this item was the most important stressor for medical staff.^{4–8,14} The second most stressful item was “preparing the hospital for accreditation,” and this result was similar to those of previous studies.^{4,5,7,14} In this study, PGY showed less stress concerning this item possibly because they do not have to directly respond for accreditation. The third most important stressor was “seeking a job promotion or doing academic research,” a result also similar to previous studies.^{4,5,14} Especially VS who had a teaching position, an MD or PhD, were aged 40

Table 2 Occupational burnout among dental staff.

Variables	n	EE	DP	PA
Job category				
PGY	24	24.35 ± 10.978	7.96 ± 6.417	19.00 ± 6.909
R	22	26.36 ± 11.631	8.55 ± 6.131	18.95 ± 4.544
VS	27	24.89 ± 13.204	7.59 ± 7.339b	21.59 ± 6.494
DA	35	28.66 ± 12.968	12.94 ± 8.040a	17.74 ± 5.674
Gender				
Female	66	27.18 ± 12.172	10.71 ± 7.481	18.59 ± 6.089
Male	42	24.90 ± 12.567	7.86 ± 7.118	20.27 ± 6.025
Teaching position				
Yes	10	26.40 ± 16.167	6.60 ± 9.276	25.40 ± 3.565a
No	98	26.30 ± 11.958	9.91 ± 7.216	18.60 ± 5.951b
Management position				
Yes	19	28.68 ± 13.679	8.26 ± 7.985	21.00 ± 6.880
No	88	25.92 ± 12.038	9.99 ± 7.315	18.74 ± 5.812
Educational level				
University or below	72	27.20 ± 11.620	10.56 ± 7.031	18.18 ± 5.613b
Graduate or PhD student	9	27.89 ± 14.057	10.22 ± 9.641	19.88 ± 7.699
MD or PhD	27	23.44 ± 13.512	6.85 ± 7.331	21.85 ± 6.243a
Age group				
≤29 years	55	27.48 ± 11.521	10.53 ± 7.105	18.80 ± 5.796
30–39 years	34	24.68 ± 12.538	8.79 ± 7.539	18.65 ± 6.124
≥40 years	19	25.89 ± 14.314	8.37 ± 8.248	21.53 ± 6.636
Seniority				
≤9 years	75	27.03 ± 11.511	10.20 ± 7.185	18.95 ± 5.826
10–19 years	24	24.13 ± 13.185	8.58 ± 7.796	18.83 ± 6.670
≥20 years	9	26.22 ± 16.791	7.33 ± 8.718	22.67 ± 6.285
Salary satisfaction				
Unsatisfied	17	33.35 ± 14.313a	12.76 ± 8.273	19.25 ± 6.028
Acceptable	67	25.26 ± 11.475b	8.78 ± 7.160	19.31 ± 6.243
Satisfied	24	24.21 ± 11.832b	9.67 ± 7.311	19.00 ± 5.949

Note: a significantly higher than b.

Table 3 Predictors of occupational burnout among dental staff.

Variables	B	P-value	Adjusted R ²
(1)EE			0.211
QMWS	0.838	<0.001	
(2)DP			0.179
DA	4.974	0.001	
QMWS	0.338	0.001	
(3)PA			0.098
Teaching position	6.802	0.001	

years or above, or had a seniority of over 20 years, perceived more stress concerning this item. These results possibly reflect the fact that most VS were older and held senior positions, or were required to do academic research in the medical center. Moreover, only VS can have a teaching or management position, and college also requires teachers to obtain a PhD and seek job promotions. Another item that reflected a similar situation for VS was "running the hospital;" those VS who held a teaching or management position perceived higher stress. VS reported higher stress on the item "job performance evaluation system," which possibly indicated that VS perceived higher stress because they were required to fulfill service volumes under the Global Budget System. Finally, female participants reported more stress regarding the item "maintaining patients' disease conditions;" similar results have never been analyzed or reported in previous studies using QMWS as an instrument, suggesting that further research is required.

Regarding occupational burnout, according to Maslach et al., the degree of burnout is high if EE, DP, and PA scores are ≥ 27 , ≥ 13 , and ≤ 31 , respectively. Burnout degree is moderate if EE, DP, and PA scores range from 17 to 26, 7 to 12, and 38 to 32, respectively.¹⁰ In this study, when we scaled up the five-item PA score to an eight-item score, we found that the average scores of MBI-HSS among DA were related with high burnout, and the average scores of VS were related with moderate burnout. The average score of DP among DA was higher compared to other medical staff whereas the average score of PA was lower.^{11,16–19} This is possibly because dental assisting has lower professional requirements and a lower salary. However, when comparing DA who worked in primary dental clinics,¹² DA who worked in medical centers showed higher average EE score, lower average DP score and higher average PA score. These results are possibly due to different work environments and system. Overall, in this sample we found that QMWS predicted EE and DP, DA predicted higher DP, and having a teaching position predicted higher PA.

This study has several limitations: First, variables regarding marital status, monthly salary, and subspecialty were excluded from the questionnaire upon request of IRB to ensure anonymity. Second, as the sample was selected from only one medical center, the generalizability of the results was restricted. Third, the Chinese version of MBI-HSS lacks a validation study and a norm based on Taiwanese dental professionals, suggesting a national survey to investigate this aspect.

Work stress and occupational burnout were common among dental staff in the medical center, which may affect

patient safety and, thus, should be valued. Hospitals should provide legal knowledge and training related to medical disputes, and administrative resources and a support system that shall swiftly intervene when a dispute arises. Stress management programs are recommended for promoting mental health of dental staff; furthermore, adjustment of the working environment and implementation of performance evaluation and promotion systems are necessary.

Conflicts of interest statement

The authors declare no potential conflicts of interest concerning the research, authorship, or publication of this article.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jds.2019.01.006>.

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