

## Scientific Research Report

## Life Satisfaction of US-trained Dental Specialists in Taiwan



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## ABSTRACT

**Objective:** A large number of residents in US advanced specialty education programmes are foreign-trained dentists. When faced with the career dilemma of applying for US residency training, foreign-trained dentists may wonder whether it is worth proceeding along that path. In addition, studies capturing benefits from receiving US residency training are rare. Therefore, this study compared the life satisfaction amongst 3 dentist groups in Taiwan (ie, US-trained specialists, Taiwan-trained specialists, and general dentists).

**Methods:** Cross-sectional surveys were distributed to dentists currently residing in Taiwan. Participants were surveyed about demographic information, career-related information, and life satisfaction. Life satisfaction was measured with a structured Satisfaction With Life Scale (SWLS). Nonparametric bivariate analyses and multivariable adjusted generalised linear model (GLM) were used to examine the differences between mean SWLS scores and examined variables. We included 134 US-trained specialists, 134 Taiwan-trained specialists, and 134 general dentists matched for age, sex, and marital status.

**Results:** With the mean age of  $51.4 \pm 10.8$  years old, specialists had significantly higher mean life satisfaction scores than general dentists. US-trained specialists had significantly higher mean life satisfaction scores than Taiwan-trained specialists when health and family relationships were not considered. Career-rated factors (eg, spending more clinical hours with patients, having more expenses related to continuing education, publishing more peer-reviewed articles, and being a frequent speaker) were not associated with better life satisfaction.

**Conclusions:** US-trained specialists were more likely to be satisfied with their lives than Taiwan-trained specialists and general dentists. However, health and social relationships contribute more to dentists' life satisfaction than do career-rated factors.

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## Introduction

Many young dentists face the career choice of whether to apply for specialty training. Apart from gaining knowledge and skills, they question whether being a specialist holds any

greater value or whether it is worth spending the extra years to become a specialist with so many continuing education (CE) courses being offered.<sup>1</sup> It has been shown that US dental students perceived orthodontists, followed by general dentists, to have the best future life quality.<sup>2</sup> However, studies that capture the benefits of being a specialist are scarce.

The number of foreign-trained dentists entering US specialty residency training is increasing. According to the American Dental Association, 40% of prosthodontic residents and 31% of periodontal residents in US advanced dental education

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programmes are foreign-trained dentists.<sup>3</sup> To specialise abroad or not is another common question asked by foreign-trained dentists. However, evidence of benefits from receiving US residency is also limited.

People rank having a satisfying life as one of their top life goals.<sup>4</sup> Life satisfaction is a summary appraisal of the quality of one's life on the basis of one's own unique criteria and is the cognitive component of one's subjective well-being.<sup>5</sup> When the well-being of health care providers is improved, it will benefit not only themselves but also the health care systems and quality of patient care.<sup>6,7</sup> Before longitudinally exploring whether spending extra years on specialty residency or US specialty residency training may enhance the life satisfaction a dentist, it is helpful to first cross-sectionally identify whether specialists or US-trained specialists are more satisfied with their current lives than other dentists with similar backgrounds.

The specialty training system in Taiwan is fundamentally the same as the system in the US. However, unlike US specialty associations that have been in existence for many years, most of the Taiwanese specialty associations were founded in the late 1980s. Further, since 1975 US residency programmes receive Commission on Dental Accreditation (CODA) accreditation as a means of assessing program standards. By contrast, the majority of the dental specialty residency programmes in Taiwan were not nationally recognised or regulated by Taiwanese authorities until recently.

This cross-sectional study aimed to compare the life satisfaction amongst 3 dentist groups in Taiwan (ie, specialists trained in the US, specialists trained in Taiwan, and general dentists). We also aimed to identify the potential factors that might be associated with the life satisfaction of dentists to shed light on career and life choices for future dental graduates.

## Methods

### Design and participants

This study was approved by the Institutional Review Board from University of Michigan, Ann Arbor, USA (No. HUM00155739). Dentists who graduated from dental schools in Taiwan were invited to complete the surveys created using online software (SurveyMonkey). With a population-based design, participant email addresses were obtained from professional dental specialty associations and dental school official websites. Email invitations were then sent to invite participation. Participation was also invited to dentist attendees at annual dental conferences. In addition, the surveys were posted in dentist-only groups on social media sites. The surveys were distributed from December 2018 to August 2020.

Any participant who identified himself/herself as (a) a dental student, (b) a current resident in training, (c) not a graduate of a dental school in Taiwan, or (d) not currently residing in Taiwan was excluded in the current study. Because of a small number of Taiwanese graduates entering US residency training in fields other than endodontics, orthodontics, paediatric dentistry, periodontics, and

prosthodontics, any specialists who were not in these 5 specialties were also excluded in the present study. Only the participants who completed specialty residency training from CODA-accredited programmes were counted as US-trained specialists. Participants who completed specialty residency training recognised by the Taiwan Ministry of Health and Welfare were counted as Taiwan-trained specialists. Those who received training from other nonaccredited programmes (such as implant or orthodontic fellowships for international dentists) were grouped with general dentists.

### Measures

Life satisfaction was measured using a subjective questionnaire, the Satisfaction With Life Scale (SWLS).<sup>8</sup> The SWLS allows subjects to integrate and weigh these domains in whatever way they choose and does not measure satisfaction with specific life domains. In the present study, a 5-point Likert scale, which has been validated with the Cronbach's alpha coefficient of 0.82,<sup>9</sup> was used instead of the original 7-point Likert scale SWLS. The mean score of SWLS of each participant was the sum of 5 items divided by 5 to have a minimum of 1 and a maximum of 5. The Chinese translation of SWLS has been shown to be a reliable and valid tool for measuring life satisfaction.<sup>10,11</sup>

In addition to the SWLS, the questionnaire comprised the following: (1) demographic information, marital status, number of children, self-rated health, and relationship with family and friends; (2) questions relating to dental career, which include highest education level, major workplace, number of clinical hours per week last year, amount of expenses on CE courses last year, number of times being a speaker last year, number of peer-reviewed articles ever published in Science Citation Index (SCI)-indexed journals, and class rank in dental school; and (3) questions relating to their specialties, which include where the training was received, field of specialty, and specialty board certification status.

### Data analyses

Only fully completed surveys were included. Due to the disparate sample sizes amongst groups, the samples from the groups of Taiwan-trained specialists and general dentists were randomly selected using dedicated software (SPSS Statistics, IBM) to match for the age, gender, and marital status of US-trained specialist group.

The Mann-Whitney U, Chi-square test, and the Spearman rank were used in bivariate analyses (Tables 1 and 2 and Figure). A multivariable-adjusted generalised linear model (GLM) was used to determine the independent determinants for SWLS of each and combined specialisation qualification groups. Any examined variables with a *P* value >.2 in associated with SWLS on bivariate analysis were excluded in the GLM analysis. When 2 examined variables had a correlation of 0.6 or more, the variable with lower correlation to SWLS was also excluded. A *P* value <.05 was set as statistically significant. The actual power was .95 from the power analysis.

**Table 1 – Demographic characteristics, health, and social relationships by different specialisation qualifications (n = 402).**

Variable	Mean ± SD or No. (%)			P value <sup>a</sup>	
	US-trained specialist (US, n = 134)	Taiwan-trained specialist (TW, n = 134)	General dentist (GD, n=134)	US vs TW	TW vs GD
Age (years)	51.4 ± 11.5	51.4 ± 10.3	51.4 ± 10.6	.946	.993
Age received DDS (in years)	25.0 ± 1.7	25.4 ± 2.1	25.6 ± 2.5	.185	.550
Gender	Male	86 (64.2)	86 (64.2)	1.000	1.000
	Female	48 (35.8)	48 (35.8)		
Marital status	Single/separated	24 (17.9)	24 (17.9)	1.000	1.000
	Married/cohabitated	110 (82.1)	110 (82.1)		
Number of children	1.60 ± 1.00	1.60 ± 1.08	1.47±1.05	.933	.234
Self-rated health	Very poor	0 (0.0)	1 (0.7)	.138	.174
	Poor	7 (5.2)	15 (11.2)		
	Fair	33 (24.6)	42 (31.3)		
	Good	79 (59.0)	65 (48.5)		
	Very good	15 (11.2)	11 (8.2)		
Interaction with family	Very poor	0 (0.0)	1 (0.7)	.214	.141
	Poor	1 (0.7)	2 (1.5)		
	Fair	17 (12.7)	23 (17.2)		
	Good	74 (55.2)	81 (60.4)		
Relationship with friends	Very good	42 (31.3)	27 (20.1)		
	Very poor	0 (0.0)	0 (0.0)	.025*	.187
	Poor	0 (0.0)	2 (1.5)		
	Fair	13 (9.7)	28 (20.9)		
	Good	95 (70.9)	86 (64.2)		
	Very good	26 (19.4)	18 (13.4)		
Satisfaction With Life Scale	3.97 ± 0.69	3.73 ± 0.65	3.49 ± 0.68	.003*	.002*

<sup>a</sup> Mann-Whitney U or  $\chi^2$  test. DDS, doctor of dental surgery.

\*  $P < .05$ .

## Results

### Descriptive analysis

The overall response rate from email invitations was 32.9%. A total of 402 matched samples were included in the analysis (ie, 134 US-trained specialists, 134 Taiwan-trained specialists, and 134 general dentists). Overall, the mean age of participants was 51.4 years (median, 52; SD, 10.8; range, 33-76). There was no significant difference amongst different specialisation qualification groups in all examined variables of demographic information, health, and social relationships, except the relationship with friends and SWLS scores (Table 1). Taiwan-trained specialists demonstrated significantly lower mean SWLS scores than US-trained specialists did ( $P = .003$ ), but higher mean SWLS scores than general dentists did ( $P = .002$ ). Career characteristics are presented in Table 2. There were significant differences in all examined career variables, except “CE expenses last year,” amongst the 3 different specialisation qualification groups.

### Life satisfaction by different variables

With bivariate analyses, age, self-rated health, interaction with family, and relationship with friends were significantly associated with the mean SWLS scores in every specialisation qualification group (Figure, part A). The number of children was significantly associated with the mean SWLS scores in US-trained specialists but not in Taiwan-trained specialists or general dentists.

### Multivariate analysis

In multivariate GLM analysis, gender, marital status, highest education level, main workplace, being a speaker last year, specialty board certification, and specialty type were excluded due to  $P$  values  $> .2$  associated with SWLS in bivariate analyses (Figure, intragroup). Relationships with friends were also excluded due to its significant 0.6 correlation with interaction with family. Multivariate GLM showed that self-rated health and interaction with family were significantly associated with mean SWLS scores in all 3 specialisation qualification groups after accounting for other examined potential confounders.

When 3 specialisation qualification groups were all examined together (Table 4), Taiwan-trained specialists demonstrated significantly ( $P = .040$ ) higher mean SWLS score than general dentists after considering all examined variables. US-trained specialists demonstrated significantly ( $P = .009$ ) higher mean SWLS scores than Taiwan-trained specialists did without considering health or interaction with family (Table 4, model 1). When health and interaction with family were controlled, US-trained specialists no longer demonstrated significantly ( $P = .117$ ) higher mean SWLS scores than those trained in Taiwan (Table 4, model 2).

## Discussion

Using multivariable analysis, we observed that specialists had significantly higher mean life satisfaction scores than

**Table 2 – Career characteristics by different specialisation qualifications (n = 134 per group).**

Variable		No. (%)			P value <sup>a</sup>	
		US-trained specialist (US)	Taiwan-trained specialist (TW)	General dentist (GD)	US vs TW	TW vs GD
Highest education	Bachelor	15 (11.2)	69 (51.5)	111 (82.8)	<.001*	<.001*
	Master	102 (76.1)	45 (33.6)	18 (13.4)		
	Doctorate	17 (12.7)	20 (14.9)	5 (3.7)		
Main workplace	Private practice	99 (73.9)	103 (76.9)	131 (97.8)	.571	<.001*
	Hospital or school	35 (26.1)	31 (23.1)	3 (2.2)		
Clinical hours	<10 (hours/week)	21 (15.7)	4 (3.0)	5 (3.7)	.001*	.066
	10-19	7 (5.2)	15 (11.2)	8 (6.0)		
	20-29	35 (26.1)	33 (24.6)	22 (16.4)		
	30-39	43 (32.1)	37 (27.6)	57 (42.5)		
	≥40	28 (20.9)	45 (33.6)	42 (31.3)		
CE expenses last year	<NTD50,000 <sup>b</sup>	63 (47.0)	64 (47.8)	75 (56.0)	.910	.584
	50,000-99,999 <sup>b</sup>	29 (21.6)	31 (23.1)	28 (20.9)		
	100,000-199,999 <sup>b</sup>	22 (16.4)	23 (17.2)	18 (13.4)		
	≥NTD200,000 <sup>b</sup>	20 (14.9)	16 (11.9)	13 (9.7)		
Being a speaker last year	0 times	46 (34.3)	76 (56.7)	114 (85.1)	<.001*	<.001*
	1-5 times	60 (44.8)	52 (38.8)	18 (13.4)		
	≥6 times	28 (20.9)	6 (4.5)	2 (1.5)		
Articles ever published	0 articles	54 (40.3)	84 (62.7)	122 (91.0)	.001*	<.001*
	1-2 articles	43 (32.1)	25 (18.7)	9 (6.7)		
	≥3 articles	37 (27.6)	25 (18.7)	3 (2.2)		
Class rank	Top 25%	87 (64.9)	71 (53.0)	41 (30.6)	.077	<.001*
	26%-50%	33 (24.6)	36 (26.9)	38 (28.4)		
	51%-75%	7 (5.2)	9 (6.7)	27 (20.1)		
	Bottom 25%	7 (5.2)	18 (13.4)	28 (20.9)		
Specialty	Paediatric dentistry	15 (11.2)	20 (14.9)	–	.002*	–
	Orthodontics	26 (19.4)	32 (23.9)	–		
	Periodontics	58 (43.3)	33 (24.6)	–		
	Prosthodontics	29 (21.6)	27 (20.1)	–		
	Endodontics	6 (4.5)	22 (16.4)	–		
Board certification	Board eligible	61 (45.5) <sup>c</sup>	34 (25.4) <sup>d</sup>	–	.001*	–
	Board certified	73 (54.5) <sup>c</sup>	100 (74.6) <sup>d</sup>	–		

<sup>a</sup> Mann-Whitney U or  $\chi^2$  test.

<sup>b</sup> 1 USD = ~30 NTD.

<sup>c</sup> American Board of Endodontics, Orthodontics, Pediatric Dentistry, Periodontology, or Prosthodontics.

<sup>d</sup> Taiwanese specialty boards recognized by Ministry of Health and Welfare, Taiwan. CE, continuing education.

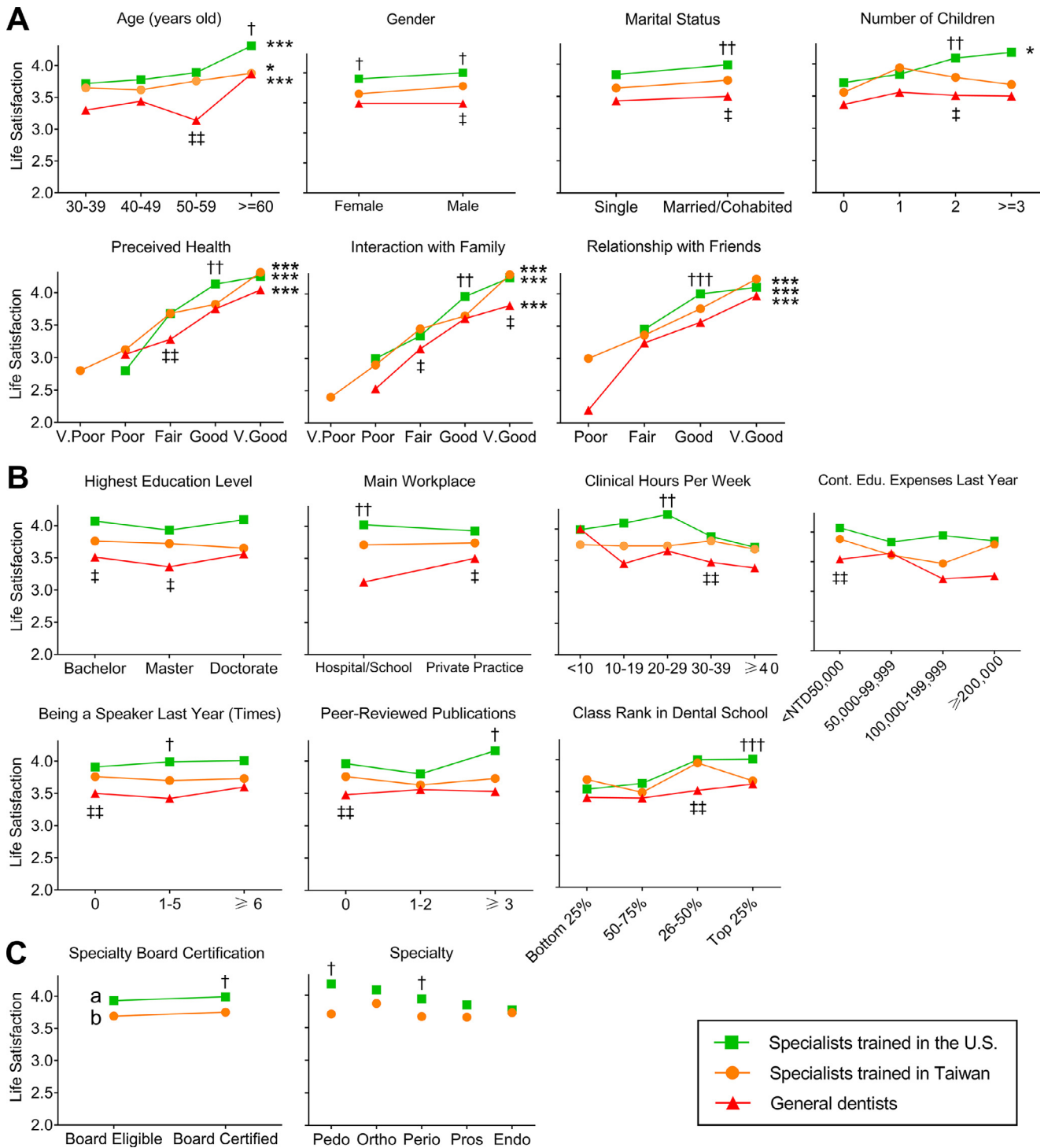
\* P < .05.

general dentists. We also found that US-trained specialists had significantly higher mean life satisfaction score than Taiwan-trained specialists when self-rated health and relationship with family were not considered (Table 4). This implies that the significantly better life satisfaction of US-trained specialists might be mediated by their better health and better family interaction than Taiwan-trained specialists. In addition, we observed that dentists' self-rated health and interaction with family were positively associated with their life satisfaction (Tables 3 and 4). By contrast, dentists' career achievements were not so associated with how satisfied they were with their own lives. Our findings may provide dental graduates with insights into potential factors that may influence their life satisfaction. The current study was also the first step in answering young graduates' question of whether being a specialist or US-trained specialist holds greater value.

Previous studies have shown that, compared with general dentists, the dental specialists in the US<sup>12</sup> and South Korea<sup>13</sup> had higher job satisfaction. Their findings regarding job satisfaction may partly explain the results of high life satisfaction

of specialists observed in the current study. A recent study also reported that specialists in the United Arab Emirates had a significantly better quality of life than general dentists in the psychological and environmental domains, but not in the social domain, the physical domain, or the overall score of a World Health Organisation questionnaire.<sup>14</sup> The mean age of 38.2 years of their participants, compared with the mean age of 51.4 years old in the present study, may explain the discrepancy between their results and what is reported here. Further, another study showed that young specialists had a lower level of life satisfaction than young general dentists in the Middle East, Africa, South America, and Southeast Europe.<sup>15</sup> The opposite results of our study compared to the last two mentioned studies may be explained by different countries, and most of their participants were young, with an annual income of less than US\$36,000.

It is well known that income is closely related to life satisfaction, but life satisfaction does not rise indefinitely with income.<sup>16,17</sup> For people with a high level of education in East Asia and North America, income is positively



**Figure – Mean life satisfaction score by (A) demographic characteristics, health, and social relationships; (B) career characteristics; and (C) specialty characteristics from US-trained specialists (US, n = 134), Taiwan-trained specialists (TW, n = 134), and general dentists (GD, n = 134).**

Intragroup: \*P < .05; \*\*P < .01; \*\*\*P < .001.

Intergroup (groups US vs TW): †P < .05; ††P < .01; †††P < .001.

Intergroup (groups TW vs GD): ‡P < .05; ‡‡P < .01; ‡‡‡P < .001.

<sup>a</sup>American Board of Endodontics, Orthodontics, Pediatric Dentistry, Periodontology, or Prosthodontics.

<sup>b</sup>Taiwanese specialty boards recognised by Ministry of Health and Welfare, Taiwan.

Endo, endodontics; Ortho, orthodontics; Pedo, paediatric dentistry; Perio, periodontics; Pros, prosthodontics.

**Table 3 – Generalized linear model of the Satisfaction With Life Scale (SWLS) mean score by residency qualification (n = 402).**

Variable	US-trained specialist in Taiwan (US, n = 134)		Taiwan-trained specialist (TW, n = 134)		General dentist (GD, n = 134)	
	Coef ( $\beta$ )	P value	Coef ( $\beta$ )	P value	Coef ( $\beta$ )	P value
Constant	1.454	–	1.385	–	1.175	–
Age	0.009	.053	0.008	.141	0.011	.046*
Number of children	0.092	.070	–0.049	.333	–0.017	.757
Self-rated health	0.273	.000*	0.201	.001*	0.213	.007*
Interaction with family	0.182	.025*	0.348	.000*	0.141	.017*
Clinical hours per week						
<20 hours	0.106	.487	–0.234	.119	0.141	.468
21-29 hours	0.270	.063	0.031	.812	0.186	.237
31-39 hours	0.101	.446	0.099	.414	0.156	.202
≥40 hours	Referent		Referent		Referent	
CE expenses last year						
<NTD50,000 <sup>a</sup>	–0.056	.695	0.028	.856	0.131	.477
NTD 50,000-99,999 <sup>a</sup>	–0.126	.421	–0.155	.356	0.183	.367
NTD 100,000-199,999 <sup>a</sup>	–0.002	.989	–0.116	.515	–0.137	.532
≥NTD200,000 <sup>a</sup>	Referent		Referent		Referent	
Articles ever published						
0 articles	–0.172	.135	–0.051	.678	–0.123	.729
1-2 articles	–0.200	.106	–0.162	.287	–0.084	.838
≥ 3 articles	Referent		Referent		Referent	
Dental school class rank						
Top 25%	0.230	.151	–0.038	.751	0.181	.152
26%-50%	0.127	.474	0.171	.215	0.153	.225
Bottom 50%	Referent		Referent		Referent	

CE, continuing education.

<sup>a</sup> 1 USD = ~30 NTD.

\* P < .05.

associated with life satisfaction only when annual household income is less than US\$110,000.<sup>17</sup> For early-career dentists, having an annual household income of less than US\$110,000 is likely, which may contribute to their low level of life satisfaction. Once the basic economic needs have been fulfilled and after crossing the US\$110,000 threshold, money brings limited improvements in life satisfaction. The first reason is that material desires, which are a negative predictor of life satisfaction, increase relative to societal income, and people evaluate their incomes by social comparison.<sup>18,19</sup> The second reason is that when income increases and stays stable over an extended period, people will adapt to the new level of wealth. Increased wealth often leads to increased levels of stress.<sup>20</sup> Income was not assessed in the present study because the income of a dentist is a sensitive topic in Taiwan, and estimating real income is difficult because of the unique tax system in Taiwan. We, therefore, cannot identify whether the high life satisfaction of specialists is associated with their income.

It has been shown that, after controlling income and other socioeconomic variables, increased levels of education can directly increase subjective well-being due to a “self-confidence” or “self-estimation” effect from acquiring knowledge.<sup>21</sup> A common pattern shared by Taiwan, Japan, and Korea also showed that education enhances one’s happiness, but income is a relatively unimportant factor, whilst interpersonal networks and interaction with the “wider world” account for a greater impact of happiness

gained from education in these 3 East Asian countries.<sup>22</sup> In other words, it is possible that advanced dental education might improve the life satisfaction of dentists by enhancing their ability to connect to a wider social world and broadening their horizon and then change their behaviour or daily intentional activities. Education also indirectly contributes to life satisfaction by allowing people to make progress towards their personal goals or adapt to changes in the world around them.<sup>20</sup> Having more resources and/or satisfying jobs to pursue their personal goals in life may be another point of speculation on why specialists, especially US-trained specialists, had higher mean life satisfaction scores than general dentists. On the other hand, we also cannot exclude the possibility that dental graduates who were satisfied with their lives at the start (eg, due to better health, better family interaction, or less financial stress) are more likely to persist in advanced dental education and pursue specialty training.

Most of the recent studies in the general public, including the data drawn from Taiwan, found a U-shaped relationship between life satisfaction and age, with high levels of life satisfaction being experienced before 30 and after 60 years old.<sup>23-25</sup> However, we found that life satisfaction was lowest in early-career dentists (Figure, part A). Our results are in accordance with the previous studies that show that older dentists and physicians had higher subjective well-being in comparison with their younger counterparts.<sup>15,26-28</sup> The difference between young members of the general public and early-career dentists may be explained by the financial stress of

**Table 4 – Generalized linear model of the Satisfaction With Life Scale (SWLS) mean score: comparing different specialisation qualifications (n = 402).**

	Model 1		Model 2	
	Coef ( $\beta$ )	P value	Coef ( $\beta$ )	P value
Constant	2.938	–	1.395	–
Specialisation				
US-trained	0.205*	.009*	0.111	.117
Taiwan-trained	Referent		Referent	
General dentist	–0.209*	.010*	–0.150*	.040*
Age	0.015*	.000*	0.010*	.001*
Number of children	0.019	.569	0.009	.758
Self-rated health	–	–	0.227*	.000*
Interaction with family	–	–	0.259*	.000*
Clinical hours per week				
<20 hours	0.089	.389	–0.012	.895
21-29 hours	0.269*	.003*	0.146	.075
31-39 hours	0.138	.086	0.086	.231
≥40 hours	Referent		Referent	
CE expenses last year				
<NTD50,000 <sup>a</sup>	0.073	.476	0.034	.708
NTD50,000-99,999 <sup>a</sup>	–0.046	.680	–0.048	.635
NTD100,000-199,999 <sup>a</sup>	–0.171	.151	–0.079	.461
≥NTD200,000 <sup>a</sup>	Referent		Referent	
Articles ever published				
0 articles	–0.070	.458	–0.085	.313
1-2 articles	–0.170	.108	–0.149	.117
≥3 articles	Referent		Referent	
Class rank in dental school				
Top 25%	0.213*	.010*	0.141	.058
26% to 50%	0.243*	.007*	0.165*	.040*
Bottom 50%	Referent		Referent	

CE, continuing education.

<sup>a</sup> 1 USD = ~30 NTD.

\* P < .05.

dentists and the fact that dentistry is a stressful occupation, but fortunately, the greater the experience of the dentists, the lower is their susceptibility to stress at work.<sup>29</sup>

Good perceived health and good social relationships are strong predictors of life satisfaction.<sup>30,31</sup> On the other hand, people with high levels of life satisfaction are more likely to be healthier as well, because of greater self-control and coping abilities.<sup>31,32</sup> People with high levels of subjective well-being also gain many tangible benefits, such as more friends, increased productivity, and more money, partly because they are relatively more cooperative and other-centred.<sup>32</sup> In the current study, we showed that the self-rated health and social relationships of dentists were positively associated with their life satisfaction (Figure, part A, Tables 3 and 4). These results are consistent with the results from studies of US and Norwegian physicians, in which those who had social support and good health and those who frequently exercise had better life satisfaction.<sup>26,33,34</sup> In addition, our results implied that the significantly better life satisfaction in US-trained specialists in comparison with Taiwan-trained specialists might be mediated by their better health and better relationships with family (Table 4). It has been shown that US

dentists exercise on average 5 hours per week, and 94% of US dentists engaged in some form of exercise in an average week.<sup>35</sup> However, because of the limitations of our cross-sectional design, we are unable to clarify whether the exposure to US culture during US residency training had any influence on their habits regarding exercise.

Although long clinical hours and high expenses on CE courses may theoretically increase a dentist's income, long clinical hours and high expenses on CE courses a year ago were not found to be associated with higher life satisfaction in both bivariate and multivariate analyses in the present study (Figure, part B, Tables 3 and 4). A previous study has shown that excessive work hours of US physicians have a negative association with their life satisfaction, even when those hours are perceived as personally rewarding by those physicians.<sup>36</sup> As a matter of fact, individuals who put emphasis on financial success and fame are more likely to end up less satisfied with their lives than individuals who do not crave wealth and fame.<sup>37</sup> This is because they may be distracted from other more effective routes to subjective well-being, such as nurturing social relationships, enjoying the present, and contributing to their communities.

### Strengths and limitations

The present study has certain limitations. First, due to the cross-sectional design, the causality of the relationship between life satisfaction and specialisation qualification could not be assumed. Better life satisfaction has been shown to be both the cause and consequence of success,<sup>32</sup> higher income,<sup>4</sup> and better health.<sup>30</sup> Longitudinal studies will be needed to clarify the cause-and-effect relationship. Second, financial status at the time when participants graduated from dental school and current financial condition were not gathered in the present study. The dental graduates who pursued specialty training, especially for US programs, usually have less financial stress. Fortunately, with the mean age of 51.4 years old, the impact of family or student loan debt on their current life satisfaction may have diminished. Third, this study is limited to Taiwanese dental graduates. The generalisability of the findings from the present study to dentists in other countries remains unclear. Our research results may not represent the perceptions of all dentists. Fourth, we used convenience sample to recruit participants via invitation from the authors and professional associations. There is a possibility of nonresponse bias and incomplete control of confounders. All the information was based on self-reported information. Consideration should be given to the accuracy of self-report measures.

### Conclusions

An important finding in our data is that health and relationships with family and friends contribute significantly more to dentists' life satisfaction than do job-rated factors, such as spending more clinical hours with patients, spending a

greater amount of money on continuing education, publishing more peer-reviewed articles, and being a frequent speaker. We also observed that specialists trained in Taiwan had lower mean life satisfaction scores than US-trained specialists but higher mean life satisfaction scores than general dentists. We hope our results can provide future dental graduates and students with some objective information on career and life choices. However, longitudinal studies are still required to verify our results.

### Conflict of interest

None disclosed.

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### Supplementary materials

Supplementary material associated with this article can be found in the online version at [doi:10.1016/j.identj.2021.12.001](https://doi.org/10.1016/j.identj.2021.12.001).

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