

Quality of Life of Postgraduate Dental Students in Australia and New Zealand

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Abstract

Objective: To assess the quality of life (QOL) of dental specialist trainees in Australia and New Zealand during their postgraduate training programs.

Methods: An online survey was sent to postgraduate dental specialist trainees enrolled in the Doctor of Clinical Dentistry program across universities in Australia and New Zealand. The survey questionnaire included 26 questions from the World Health Organisation Quality of Life- BREF questionnaire with 3 additional university work-related questions. Data was categorized by sample demographic variables. The questionnaire included questions related to QOL and general health in 4 domains: Physical, Psychosocial, Social and Environmental. The mean and standard deviation (SD) of the four domains was estimated with nonparametric Kruskal-Wallis test for intergroup comparisons. Chi-squared tests were used to determine statistically significant differences between categorical variables.

Results: There was a total of 97 participants. The overall QOL of trainees was poor, with only one-third (32.3%) rating having positive quality of life. More trainees in their second and third year of specialty training indicated poor general health (52.0% and 55.6% respectively) compared to their first-year counterparts. Participants aged 40 years and above indicated poorer physical health (mean score 45.5 years) compared to participants aged 25 - 39-years (mean score 65.7). Most trainees (98.0%) studied in weekends.

Conclusion: Most dental specialist trainees have a poor-average QOL with significant work/life imbalance. The well-being and work/life balance of postgraduate dental students needs to be a priority in dental education.

Keywords: World Health Organisation Quality of Life-BREF (WHOQOL-BREF); Physical Health; Psychosocial Health; Social; Environment

Abbreviations

QOL: Quality of Life; WHO: The World Health Organization; WHOQOL-BREF: World Health Organisation Quality of Life-BREF

Introduction

Postgraduate specialty training is a significant career change from life as a general dentist. In Australia and New Zealand, potential dental specialty applicants are required to have a minimum of 2 years dental experience prior to applying for any dental specialty program. Within the rigorous curriculum, trainees are assigned many responsibilities including self-study, patient care, teaching and research. In addition, some trainees may have additional considerations such as family support, financial constraints and accumulated study loans which can add additional pressure to their lives [1].

Numerous studies have investigated various aspects of quality of life of postgraduate medical residents and dental students [1-4]. Dyrbye and colleagues reported that burnout and high fatigue levels were common during medical residency training [4]. A high stress level influenced by academic and work overload and education debt can lead to physical and emotional burnout which has a negative effect on academic performance, physical and psychological health [1,3,5]. Poorer physical and mental health has been associated with negative effects on patient care including major medical and

medication errors, and poorer clinical performance [6-10]. The identification and support for vulnerable individuals early in their training are critical to promote emotional wellbeing [11]. Most studies have only investigated some aspects of quality of life, burnout and stress [1,2,5,11]. In addition, results are often collected from several hospitals or a single university, with limited national-level data.

The World Health Organization (WHO) defines quality of life (QOL) as an individuals' perception and level of satisfaction of their life including their physical, mental and social wellbeing [12]. This topic is becoming increasingly relevant as the concept of health has shifted from a predominantly physical focus to encompass a multi-factorial view to include psychological, social and environmental health. There are several validated quality of life instruments, including the WHOQOL-100 [12]. WHOQOL-100 was considered impractical in a clinical setting because of its extensive length, so the WHOQOL-BREF was developed as a more concise version [12]. WHOQOL-BREF encompasses topics related to general health, quality of life and 4 other domains: Physical, Psychosocial, Physiological and Environmental health [12]. Domain scores of the WHOQOL-BREF are highly correlated with WHOQOL-100 domain scores, with demonstrated good criterion, content and discriminant validity and reliability [12].

Aims and Objectives

The aim of this research was to assess the quality of life of postgraduate dental students in Australia and New Zealand during their specialty training using the WHOQOL-BREF questionnaire. It was hypothesized that the quality of life of postgraduate dental students would be poor during their training program due to intensity of the curriculum.

Methods

The study received approval from the Human Research Ethics Committee of the University of Adelaide (Ethics ID- H-2017-159).

The WHOQOL-BREF questionnaire plus three additional questions were used to formulate an online-based questionnaire. The sample selected comprised students enrolled in the 3-year Doctor of Clinical Dentistry (DCD) program in Australia and New Zealand. These included the University of Queensland, University of Sydney, University of Melbourne, University of Adelaide, University of Western Australia, Griffith University and University of Otago. The oral maxillofacial specialty training program was excluded because the specialty varies in its educational delivery as it is part of a medical college system instead of a university-based degree. PhD and Masters students were excluded because their training programs are not full-time clinically-based.

Prior to survey implementation the primary author (AH) emailed the Head of Department of each specialty program or course coordinator of the DCD courses at each university to identify the total number of students within each program. Two reminder emails were sent.

Following this, third author (CD) sent an email to each Head of Department or course coordinator to invite their department to participate, and to distribute an email containing an ethics-approved "Participant Information" document and online-based questionnaire link. Reminder emails were sent out 4 and 8 weeks later. The deadline for the survey was set 8 weeks after the last (3rd) reminder email was sent. There was no direct contact between the researchers and participants, and the survey was completed anonymously via a Qualtrics survey platform.

Participants provided basic demographic data. Twenty-six questions examined participant's overall perception of QOL, general health and 3 additional lifestyle questions (See supplementary table S1). A Likert scale was used for responses; 1) Not at All, 2) A Little, 3) A Moderate Amount, 4) Very Much and 5) Extreme Amount. The four individual QOL domain scores were scaled in a positive direction (0 to 100); with higher scores representing higher quality of life (E.g. a higher score in the Social domain correlates to better social-related quality of life) [12].

Data were collected between March-April 2018. The sample demographic characteristics included age (< 25/25 - 29/30 - 34/35 - 39/≥ 40 years), gender (Female/Male), program (Periodontics/Prosthodontics/Endodontics/ Oral Medicine/ Oral Pathology/ Orthodontics/ Special Needs Dentistry/ Dento-Maxillofacial Radiology/ Pediatric Dentistry), years in program (1/2/3 years), university (University of Queensland /Sydney/ Melbourne/ Western Australia/Adelaide/Griffith/Otago) and marital status (Single/In a relationship/Married/Divorced or Separated). The outcome of interest included general health, QOL, and attitude/experience related to postgraduate dental training.

Data analysis

Basic descriptive analyses were conducted to ascertain frequencies and percentages of sample characteristics. Bivariate analyses were then conducted to identify associations between sample characteristics and outcome variables. Chi-squared tests (or Fisher's Exact Test when cell values

were < 5) were used to determine statistically significant differences between categorical outcomes: frequency of 1) QOL ('Very poor/Poor', 'Neither Poor/Good' and 'Good/Very good'), 2) 'General health' ('Very dissatisfied/Dissatisfied', 'Neither dissatisfied/Satisfied', and 'Satisfied/Very satisfied'); 3) 'Think about study', 4) 'Work and study on weekend' (Quite often/Very often/ Always' and 'Not a lot/A little'), and 5) 'Self-rated for work/life balance' ('Very poor/Poor' and 'Neither poor or good/Good/Very good'). The mean and standard deviation (SD) of the four QOL domains (including Physical, Psychosocial, Physiological and Environmental health) was estimated using the nonparametric Kruskal-Wallis test for intergroup comparisons. P-values ≤ 0.05 denoted statistically significant differences. SAS version 9.4 (SAS Institute Inc., Cary, NC, USA) was used for all analyses.

Results

Response rate and demographics

Ninety-seven responses were available for analysis. This was out of a potential 181 responses (based on data collected from specialty departments), a response rate of 53.6%. Half the participants were between 25 - 29 years old. There were 59 men and 38 women. A variety of specialist dental trainees are represented in the sample, except oral pathology trainees (they made no response): 12 periodontic, 10 prosthodontic, 9 endodontic, 4 oral medicine, 42 orthodontic, 10 special needs dentistry, 2 dento-maxillofacial radiology and 8 paediatric trainees (Table 1).

		Number	P-value
Total		97	-
Age (years)	< 25	-	< 0.0001
	25 - 29	51	
	30 - 34	33	
	35 - 39	9	
	> 40	4	
Gender	Female	38	0.0330
	Male	59	
Programs	Periodontics	12	< 0.0001
	Prosthodontics	10	
	Endodontics	9	
	Oral Medicine	4	
	Oral Pathology	-	
	Orthodontics	42	
	Special Needs Dentistry	10	
	Dento-Maxillofacial Radiology	2	
	Pediatric Dentistry	8	
Universities	University of Queensland	16	0.0031
	University of Sydney	16	
	University of Melbourne	29	
	University of Western Australia	6	
	University of Adelaide	18	
	Griffith University	-	
	University of Otago	12	
Year in program	1	41	0.1751
	2	28	
	3	28	
Relationship status	Single	24	< 0.0001
	In a Relationship	27	
	Married	44	
	Divorced/Separated	2	

Table 1: Sample demographics characteristics of postgraduate dental students in Australia and New Zealand.

Notes: P-value: Chi-square test or Fisher's exact test for cell values less than 5.

Ratings of QOL and general health

The trainee's ratings of QOL and general health are shown in table 2. The responses to QOL ratings were equally distributed between "Very Poor/Poor" (35/93 = 37.6%), "Neither Poor/Good" (28/93 = 30.1%) or "Good/Very Good" QOL (30/93 = 32.3%) with a slight majority having a negative QOL. A slightly higher proportion of trainees reported having poor general health (39/93 = 41.9%) compared with those who reported having "Nei-

ther Poor/Good" (19/93 = 20.4%) or "Good/Very Good" general health (35/93 = 37.6%) but the differences were not statistically significant. There was no statistically significant association between trainees' QOL and general health to their age range, gender, specialty choices or relationships status. Also, there was no significant correlation between the number of years in the program and general health ratings ($P > 0.05$). A higher proportion of trainees in their second and third year reported having "Very Poor/Poor" general health (13/25 = 52.0% and 13/25 = 55.6% respectively) compared with first year trainees (11/41 = 26.8%).

		Quality of life (How would you rate your QOL?)				General health (How satisfied are you with your health?)			
		Very Poor/Poor	Neither Poor/Good	Good/Very Good	P-value	Very dissatisfied/Dissatisfied	Neither dissatisfied/Satisfied	Satisfied/Very satisfied	P-value
		N	N	N		N	N	N	
Total		35	28	30	0.8387	39	19	35	0.0270
Age (years)	<25	-	-	-	0.3984	-	-	-	0.7428
	25-29	18	15	15		18	10	20	
	30-34	10	11	11		14	7	11	
	25-39	3	2	4		4	1	4	
	>40	4	0	0		3	1	0	
Gender	Female	12	15	11	0.2708	15	7	16	0.7554
	Male	23	13	19		24	12	19	
Programs	Periodontics	4	4	4	0.9710	5	4	3	0.7360
	Prosthodontics	5	1	3		4	3	2	
	Endodontics	3	2	3		4	0	4	
	Oral Medicine	2	1	1		2	0	2	
	Oral Pathology	-	-	-		-	-	-	
	Orthodontics	15	13	13		18	7	16	
	Special Needs Dentistry	3	3	4		2	3	5	
	Dento-Maxillofacial Radiology	0	0	1		0	0	1	
	Pediatric Dentistry	3	4	1		4	2	2	
Universities	University of Queensland	6	1	8	0.0237	7	1	7	0.1862
	University of Sydney	7	5	3		9	3	3	
	University of Melbourne	13	12	3		11	10	7	
	University of Western Australia	1	3	2		3	1	2	
	University of Adelaide	3	5	9		4	2	11	
	Griffith University	-	-	-		-	-	-	
	University of Otago	5	12	5		5	2	5	
Year in program	1	10	14	17	0.1577	11	13	17	0.0707
	2	12	8	5		13	3	9	
	3	13	6	8		15	3	9	
Relationship status	Single	7	10	7	0.7405	7	6	11	0.5481
	In a Relationship	9	8	7		11	4	9	
	Married	18	10	15		21	8	14	
	Divorced/Separated	1	0	1		0	1	1	

Table 2: Frequency of quality of life (QOL) and general health (GH).
Notes: P-value: Chi-square test or Fisher's exact test for cell values less than 5.

Domain 1- Physical health

Age was a significant factor related to the variation in physical QOL scores between trainees ($p < 0.05$) (Table 3). Trainees aged over 40 years had the lowest physical score (45.5), compared with the younger age group (25-39 years) which ranged from 60.8-65.7. Overall, the average participant's physical domain score was 62.8, indicating that the average physical health-related QOL of trainees was poor.

	Physical Health		Psychological health		Social relationship		Environment	
	Mean (SD)	P-value	Mean (SD)	P-value	Mean (SD)	P-value	Mean (SD)	P-value
Total	62.8 (16.6)		56.6 (1.4)		57.2 (20.5)		60.2 (14.9)	
Age (Years)		0.0489		0.3938		0.2688		0.4165
< 25	-		-				-	
25 - 29	65.7 (15.5)		58.1(17.3)		60.0 (21.0)		61.5 (15.0)	
30 - 34	60.8 (18.6)		55.0 (15.5)		55.5 (19.0)		60.3 (13.8)	
35 - 39	62.7 (13.5)		59.1 (14.8)		55.6 (25.0)		56.4 (18.6)	
≥ 40	45.5 (3.0)		45.3 (13.8)		42.3 (12.8)		53.3 (14.8)	
Gender		0.6523		0.8086		0.2718		0.2206
Female	62.0 (17.1)		56.3 (15.5)		54.3 (21.8)		62.0 (15.1)	
Male	63.4 (16.3)		56.7 (17.1)		59.3 (19.5)		59.0 (14.7)	
Program		0.9571		0.8365		0.4921		0.8339
Periodontics	61.8 (24.4)		61.6 (17.6)		60.9 (23.7)		61.6 (19.1)	
Prosthodontics	57.8 (19.6)		52.8 (20.4)		57.6 (24.3)		57.0 (16.4)	
Endodontics	65.9 (16.0)		61.9 (15.9)		55.5 (11.3)		64.4 (14.9)	
Oral Medicine	61.3 (16.3)		56.5 (14.4)		37.5 (27.7)		62.5 (15.2)	
Oral Pathology	-		-		-		-	
Orthodontics	63.1 (14.6)		54.2 (16.4)		58.9 (18.3)		60.0 (12.8)	
Special Needs	61.4 (17.3)		55.7 (13.2)		54.5 (24.3)		56.5 (19.9)	
Dento-Maxillofacial Radiology	63.0 (-)		63.0 (-)		31.0 (-)		50.0 (-)	
Pediatric Dentistry	68.0 (13.4)		60.3 (17.4)		61.0 (21.4)		63.4 (133)	
Years in program		0.1925		0.4610		0.4891		0.7405
1	59.3 (16.7)		58.2 (12.0)		56.6 (19.4)		59.4 (14.4)	
2	64.5 (17.9)		53.2 (20.4)		55.6 (22.4)		60.4 (15.2)	
3	66.7 (14.4)		56.8 (18.1)		59.7 (20.9)		61.2 (15.8)	
Relationship Status		0.7905		0.9443		0.0481		0.3422
Single	59.6 (17.7)		56.9 (13.3)		48.7 (17.8)		57.1 (14.5)	
In a Relationship	65.5 (15.9)		56.9 (18.5)		63.8 (16.0)		64.2 (15.2)	
Married	63.3 (16.4)		55.9 (17.2)		58.4 (23.4)		59.3 (14.9)	
Divorce/Separated	59.5 (21.9)		62.5 (9.2)		56.0 (0.0)		69.0 (8.5)	

Table 3: Mean score and standard deviation (SD) of WHOQOL-BREF QOL by four Domains.

Notes: P-values: Kruskal-Wallis test ($P \leq 0.05$ means that not all group means are equal).

Domain 2- Psychosocial health

The average psychosocial-related QOL of trainees was poor, with a mean psychosocial score of 56.6 (Table 3). No significant differences were found by age, gender, program, years in the program and relationship status.

Domain 3- Social relationships

The mean QOL social score for participants was 57.2, which suggested a poor social-related QOL of trainees (Table 3). Relationship status was the only factor that resulted in significant variation in scores between trainees. Single respondents scored the lowest social domain score at 48.7, compared with those in a relationship who had the highest score at 63.8 ($p < 0.05$). Age, gender, program and years in the program were not significant factors related to social score variations.

Domain 4- Environment

The average environment related QOL of participants was generally poor. The overall environment score of participants was 60.2 (Table 3). Age, gender, program, years in the program and relationship status did not have a significant influence over the environment domain scores.

Frequency of study thoughts

Almost all (92/93 = 98.9%) trainees reported that they frequently thought about their studies outside of work (Table 4). No statistically significant difference was found in this frequency relating to trainees' age, gender, program, years in program, university and relationship status.

		Always think about study			Amount Work/Study on week-end			Rate Work/Life Balance		
		Quite / Very often/ Always	Not ALot/A Little	P-value	Quite / Very often/ Always	Not A Lot/A Little	P-value	Very Poor/ Poor	Neither Poor/ Good/ Very Good	P-value
		N	N		N	N		N	N	
Total		92	1	<0.0001	93	0	0.0000	68	25	<0.0001
Age (years)	< 25	-	-	0.0240				-	-	0.6977
	25 - 29	48	0		48	0	-	33	15	
	30 - 34	32	0		32	0		24	8	
	25 - 39	8	1		9	0		7	2	
	> 40	4	0		4	0		4	0	
Gender	Female	37	1	0.4086	38	0	-	30	8	0.2919
	Male	55	0		55	0		38	17	
Programs	Periodontics	12	0	0.9889	12	0	-	8	4	0.5160
	Prosthodontics	9	0		9	0		6	3	
	Endodontics	8	0		8	0		6	2	
	Oral Medicine	4	0		4	0		2	2	
	Oral Pathology	-	-		-	-		-	-	
	Orthodontics	40	1		41	0		34	7	
	Special Needs Dentistry	10	0		10	0		6	4	
	Dento-Maxillo- facia Radiology	1	0		1	0		1	0	
	Pediatric Dentistry	8	0		8	0		5	3	

Univer- sity	University of Queensland	15	0	0.0119	15	0	-	12	3	0.1178
	University of Sydney	15	0		15	0		10	5	
	University of Melbourne	28	0		28	0		22	6	
	University of Western Aus- tralia	5	1		6	0		5	1	
	University of Adelaide	17	0		17	0		8	9	
	Griffith Univer- sity	-	-		-	-		-	-	
	University of Otago	12	0		12	0		11	1	
Year in program	1	40	1	0.5267	41	0	-	28	13	0.2382
	2	25	0		25	0		17	8	
	3	27	0		27	0		23	4	
Relation- ship status	Single	24	0	0.7589	24	0	-	16	8	0.4712
	In a Relation- ship	24	0		24	0		20	4	
	Married	42	1		43	0		30	13	
	Divorced/ Separated	2	0		2	0		2	0	

Table 4: Frequency of thoughts about study, studying on weekend and rating of work/life balance.

Notes: P-value: Chi-square test (or Fisher's exact test for cell values less than 5); '-' means the P values were not calculated for amount work/study on weekend because the entire column is zero.

Work/Life balance

One hundred percent of the trainees reported that they "Quite Often/Very Often/Always" did some work or study on weekends and three-quarters (68/93 = 73%) considered their work/life balance to be extremely poor regardless of their age, gender, years in the program, university and relationship status (Table 4).

Discussion

This is the first study aiming to assess quality of life of postgraduate dental students in Australia and New Zealand during their specialty training using the WHOQOL-BREF questionnaire. On the whole, our findings supported our hypothesis. Specialty dental training program can be a stressful period. Our findings indicated that the majority of dental students did not reach 'good/very good' QOL and general health; the average WHOQOL-BREF scores of each domain was lower (around 60, compared to the maximum score 100), the proportion of work/study on weekends was very high, and work/life balance was very low. There were lower scores of physical health among those aged 40+ years and lower social relationship scores among those identifying as single.

QOL rating

The overall quality of life of postgraduate dental trainees was average-poor, with only one-third reporting having excellent QOL. There was a significant difference noted between the number of participants indicating poor QOL (37%) compared to those indicating Work Life Balance (73%). This could be attributed to many trainees acknowledging and accepting temporary imbalances in their work and personal life during the specialty training program. The willingness to accept this could have prepared them for this more intense period in their life and thus may not translate to having a reduced quality of life.

Our findings are consistent with previous studies [1,13-15]. Divaris [1] found that dental residents enrolled within a clinical program were more likely to be affected by burnout, resulting in poor QOL. This finding is in keeping with medical students [1]. Henning, *et al* reported a co-relationship between quality of life and burnout including emotional exhaustion, depersonalization and a reduced sense of personal accomplishment [13,14]. The increasing prevalence of these issues has serious consequences for the welfare of clinicians' and patients [15].

General health rating

The ratings of general health decreased as trainees progressed in year levels in their training programs. This could be attributed to the increased stress in research or clinical work in the second and third year of the respective programs and the fact that trainees have already experienced one or two years of the intense curriculum. The survey was conducted at the beginning of the year (March/April), meaning first-year trainees may not have been exposed to the full demands of the academic and clinical coursework as they would have just commenced the specialty training program.

Several studies, all based outside of Australia and New Zealand, have assessed stress, burnout and mental health of specialist dental trainees [1,2,13,16]. While the pathway of entry to postgraduate studies can vary between countries, the timelines have similarities. In Australia and New Zealand, some dental schools follow an undergraduate study model while others follow a post-graduate study model. In the United States, a college undergraduate degree is recommended (most dental students have completed four years of college), [17] and Canadian students must have a four-year bachelor's degree [18] in preparation for dental school, but can apply to a specialty program direct from dental school [1,4].

Scores- physical health and social relationship

Physical health: Trainees who were aged 40 and above had significantly poorer physical scores compared to those aged 39 and below, which indicated poorer physical health. The reasons could be attributed to a lack of time to maintain adequate physical activities due to the intensive training program with additional personal responsibilities and at-home/family commitments.

Social relationship

Single trainees had significantly poorer social scores compared to those who were in a relationship. This could be attributed to concerns about the age of commencement of the program, in addition to the workload demands and lack of time to pursue or maintain extracurricular interests. Divaris and colleagues who surveyed participants with a mean age of 30 years reported similar findings [1]. The development of better support and social programs to ensure healthy emotional well-being during the training program is important.

Frequency of work/study- related tasks on weekends

Most trainees noted that they frequently thought about study and performed work or study on the weekends regardless of their age, gender, program, university or years in the program. The longer clinical working hours and higher job-strain will ultimately lead to a higher prevalence of burnout of dental professionals [19].

Outcome of poor QOL as postgraduate dental specialist trainees

The consequences of stress and burnout are detrimental from a biological, physical, social and psychological health perspective [14]. Ensuring good overall physical, psychological and emotional health of specialty trainees supports the future of the profession and sustains high quality patient care [13]. Studies from medical sources suggest that encouraging change within the workforce by promoting positive quality of life programs including peer and support groups, reducing the stigma of seeking help and encouraging interests outside professional life can have a significant impact in reducing the risk of burnout and poor QOL [15,20-23]. Similar methods may be equally as effective among postgraduate dental residents.

Limitations of the Study

The low response rate (51%) is common among survey-based studies and suggests that the present findings may not be representative of all dental postgraduate trainees. In future studies, incentivizing responses could encourage more responses. Second, the method of survey distribution involved multiple parties at various timepoints; this may have meant that survey links were missed by the potential sample target. However, this was necessary to ensure anonymity between the primary author and participants. Third, the present study was cross-sectional and conducted at the start of the academic year. A future longitudinal study of the same respondents as they progress through the course could determine changes in QOL impacts over time.

Conclusion

A majority of trainees (around two-thirds) reported having poor to average quality of life. This highlights the intensity of the specialty clinical training programs and the need to be aware of these pressures to better identify those who might be vulnerable.

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Conflict of Interest Statement

The authors have no competing interests to declare.

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