

Tōku Oranga: the subjective wellbeing and psychological functioning of postgraduate and medical students in Ōtautahi Christchurch

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ABSTRACT

AIMS: Postgraduate and medical students are at risk of psychological distress and burnout, which can cause significant functional and occupational impairment. We aimed to report subjective wellbeing, psychological distress and burnout in postgraduate and medical students in Ōtautahi Christchurch, Aotearoa (New Zealand), and identify any associations between participant and course information and outcome measures including exposure to major earthquakes in 2010/2011 and the 2019 terrorist attack.

METHODS: A self-report online survey was completed by 140 students between November 2019 and March 2020. Life satisfaction, psychological distress and burnout were primary outcomes. Data were analysed using univariate and multivariable analysis.

RESULTS: High levels of psychological distress were present in both student groups. Burnout was reported by 78% of respondents. There were no significant associations found between exposure to the Christchurch earthquakes or terrorist attack with primary outcomes. Personality factors, resilience and perceived support and success were weakly associated with wellbeing, distress and burnout.

CONCLUSIONS: Postgraduates and medical students reported high levels of psychological distress and burnout. The earthquakes and terrorist attack do not appear to be associated with negative effects in these cohorts. Personality and resilience characteristics may assist in predicting students at risk of morbidity and evaluating potentially relevant interventions.

University students have a higher prevalence of mental disorders than the general population.¹ Within this population, postgraduate and medical students have a high prevalence of mental disorders and psychological distress with widespread personal, academic and professional repercussions.¹⁻⁴ Meta-analyses estimate the prevalence of depression in medical students to be above 25% and suggest an increase in symptoms during medical school.^{3,5} A third of medical students globally are estimated to have anxiety disorders.⁴ Medical students also present with a relatively high frequency of suicidal ideation (5.8%), but low rates of seeking help (12.9%) for their distress.³ Studies reporting on purely postgraduate students are scarce, and student and course differences make generalising findings from undergraduates to the postgraduate student population difficult.

Burnout was originally studied in professional populations, with a focus on “emotional exhaustion”, “depersonalisation” and “reduced personal accomplishment” as per the Maslach Burnout Inventory.⁶ It is now recognised in student populations and the construct has evolved, with multiple measures

developed. The Oldenburg Burnout Inventory (OLBI)⁷ employs a two-factor model incorporating “exhaustion” and “disengagement and cynicism towards studies” to measure burnout with both negatively and positively framed items. These dimensions are considered core to the concept of burnout, while “reduced personal accomplishment” is thought to develop separately.⁷ Both individual factors (e.g., personality, supports) and systemic factors (e.g., course structure and culture) contribute to burnout but are still poorly understood.^{8,9}

Burnout has both personal and wider social impacts. It is recognised as a cause for loss of productivity, reduced quality of life and physical and mental health problems—particularly in healthcare professionals, but also increasingly recognised in students. Academic burnout in students is associated with higher rates of burnout later in their professional careers.^{10,11} The prevalence of student burnout is difficult to establish given the number of different instruments used and contextual factors associated with tertiary study (e.g., country-specific funding models). Estimates of medical student burnout range between

45–75%.⁸ Findings from a longitudinal study of medical students suggest that burnout predicts psychological distress, and recovery from burnout reduces suicide risk.⁹

In Aotearoa New Zealand, concerns over medical student and postgraduate student wellbeing have been raised. The Kei Te Pai student survey of mental illness identified moderate levels of psychological distress in tertiary students in New Zealand.¹² A survey undertaken by the New Zealand Medical Students Association¹³ also identified concerns about the mental health of medical students. Te Whare Whānanga o Ōtāgo ki Ōtautahi (University of Otago, Christchurch; UOC) hosts students across postgraduate health sciences courses as well as clinical medical students (final 3 years of study). Ōtautahi Christchurch has experienced significant stressors—notably a series of earthquakes in 2010–2011 and a terrorist attack on two mosques in the city in March 2019. Both events had significant impacts on the psychosocial wellbeing of the local community. The psychological functioning of medical students in Ōtautahi Christchurch was substantially affected 7 months following the earthquakes, but this has not been re-measured.¹⁴ The extent of symptoms of mental illness in local postgraduate students has not been specifically measured.

This study aims to report subjective wellbeing and symptoms of burnout and mental illness in medical students and postgraduate students in Ōtautahi Christchurch using standardised measures. A secondary aim was to identify any associations between demographic information, perceived supports and academic course factors with psychological distress and burnout. Given the additional stressors of the earthquakes and mosque shootings, associations between exposure to these events and outcome measures were also explored to identify ongoing impacts and contributing factors to distress and burnout.

Methods

The administration of this online cross-sectional survey was approved by the University of Otago Human Ethics Committee (HE19/009) and received support from the Dean of UOC and an advisory group, including associate deans and student representatives for postgraduate and medical student groups. Study information, and consent and data collection, were managed with the online survey tool REDCAP. The survey was anonymous. Questions on post-traumatic stress

with the potential to trigger psychological distress could be skipped. Participants were provided with links to further sources of support.

Participants were postgraduate health sciences students completing Master's or PhD theses or 4th–6th year medical students, studying at UOC. Data were collected between November 2019 and March 2020. The survey closed prematurely due to the COVID-19 pandemic and its ensuing lockdown. Invitations to participate were emailed to all postgraduate thesis students in November 2019, with reminder emails at 3–4 weekly intervals. Email invitations and reminders were also sent to medical students in February 2020. Medical students were informed about the study and encouraged to participate by one of the study authors (KD) at teaching sessions in early March 2020.

Participant demographic and related information included age, gender identity, ethnicity, relationship status, English as a second language, whether born in New Zealand and perceived personal supports. Course factors included type of study, progress through course, enrolment status, perceived academic support and perceived success. Key outcomes were wellbeing, psychological distress (depression, anxiety and stress subscales) and burnout.

The survey included a comprehensive range of measures but for the purposes of this study, we report on the following measures:

- **Satisfaction with Life Scale (SWLS)**¹⁵ is a five-question measure of wellbeing and quality of life, with a seven-item Likert scale ranging from “strongly disagree” to “strongly agree”. Total scores are categorised into “extremely satisfied”, “satisfied”, “slightly satisfied”, “neutral”, “slightly dissatisfied” and “dissatisfied” and “extremely dissatisfied”.
- **Depression Anxiety and Stress Scale (DASS-21)**¹⁶ is a 21-item measure of emotional symptoms of distress yielding a total score for overall severity of symptoms plus subscale totals for depression, anxiety and stress. Subscale scores are categorised as “normal”, “mild”, “moderate”, “severe” or “extremely severe”.
- **Oldenburg Burnout Inventory—student version (OLBI-S)**¹⁷ adapts the original OLBI to the academic context. It asks 16 questions with a four-item Likert scale ranging from “totally disagree” to “totally agree”. Responses are scored for two domains of

“exhaustion” and “disengagement” with clinical cut-offs of 2.25 for “exhaustion” and 2.1 for “disengagement”.⁷ Positive scores in both domains indicate burnout.

- **The Big Five Inventory-10 (BFI-10)** is a 10-item questionnaire that measures personality dimensions of extroversion, agreeableness, conscientiousness, neuroticism and openness to experience.¹⁸ Responses range from “disagree strongly” to “agree strongly”.
- **The Conner-Davidson Resilience Scale (CD-RISC-10)**¹⁹ assesses resilience (past month) with 10 questions and five-item Likert scales of “not true at all” to “true nearly all the time”.
- **The Primary Care PTSD screen (PC-PTSD-5)** is a five-item questionnaire designed for primary care providers as a screening tool for PTSD according to DSM-5 criteria. A cut-off score of three or more is considered highly sensitive for PTSD.²⁰
- **Specific trauma exposure** is a bespoke set of questions that assessed exposure to specific stressors to Ōtautahi Christchurch (including the Canterbury earthquakes and 2019 terrorist attack) and levels of distress following these events.

Data were analysed using SPSS (version 27). Comparisons between student groups were made using t-Tests and Chi-squared tests. Continuous variables were re-coded into categorical variables according to established cut-offs for clinically significant levels of symptoms. For analysis of associations between predictor variables and outcome variables (wellbeing, emotional distress and burnout), the samples were combined as no significant differences between sample outcome measures were found between student groups. Correlation analysis and comparisons of means using ANOVA tests were undertaken for continuous and categorical predictor variables respectively. Predictor variables showing statistically significant associations were then analysed using multivariable analysis to control for other variables and to look for independent associations. The significance level was $p < .05$ (two tailed).

Results

Responses were received from 52 of 140 enrolled (38%) postgraduate students and 88 of 316 enrolled (28%) medical students (total

response rate 31%). The majority of respondents were female. The mean age for the total study population was 28.3 years (standard deviation [SD] 9.0). Postgraduate students were significantly older than medical students: the postgraduate students mean was 36.1 years (SD 10.0); the medical students mean was 23.6 years (SD 3.5 years, $p < 0.01$). Table 1 reports additional demographics, course factors and support data grouped by student type.

Of postgraduates, 73% were enrolled in PhD programmes, and the remaining in Master’s programmes. Sixty-seven percent of postgraduate respondents identified as being closer to the end of their course than the start. Of medical students, 14% were 4th year students, 53% were 5th year students and 33% were 6th year students.

Resilience scores (CD-RISC-10) were similar across both groups: the postgraduate mean was 26.2 (SD 6.1); the medical student was mean 25.0 (SD 5.8). There were no statistically significant differences in scores for resilience or personality factors (BFI-10) between postgraduates and medical students.

Only 4% of students skipped the trauma exposure questions. Exposure to the Christchurch earthquakes was higher in postgraduates than medical students (52% vs 28%, $p = 0.02$), and exposure to the 2019 mosque shootings was similar between groups (50% vs 52%, $p = 0.73$). There were no significant differences in levels of reported event-related distress between student groups. Responses from the screen for PTSD suggested 17% of postgraduates and 17% of medical students met criteria for current PTSD. Data were not collected on which event the PTSD symptoms related to.

Table 2 shows rates of reported wellbeing, psychological distress and burnout symptoms by all respondents. The mean responses from the DASS-21 corresponded to “mild” levels of depression and anxiety in both postgraduate and medical student samples, “mild” stress symptoms in the postgraduate sample and “normal” levels of stress in the medical student sample. Seventy-six percent of postgraduates and 80% of medical students met criteria for burnout (total sample 78%). There were no statistically significant differences in scores for psychological distress or burnout between student groups.

Associations among predictor variables (demographic, study and supports information, and trauma exposure) in relation to the primary outcomes (life satisfaction, DASS subscales and burnout) were examined using multivariate

Table 1: Demographic and other sample characteristics.

	Postgraduates (n=52)		Medical students (n=88)	
	N	%	N	%
Demographic information				
Female	41	79%	67	76%
In a relationship*	38	73%	40	45%
English as second language	12	24%	10	11%
Born in New Zealand*	30	58%	66	75%
Ethnicity				
NZ European	26	50%	52	59%
Māori or Pasifika	4	8%	13	15%
Other	22	42%	23	26%
Course factors				
Full-time enrolment status*	33	63%	86	98%
Concerned over academic progress	8	15%	8	9%
Adverse event exposure				
Earthquakes*	27	64%	25	36%
Terrorist attack	26	62%	46	68%
Presence of supports				
Whānau/family*	40	77%	85	97%
Cultural	5	10%	4	5%
Academic/administrative*	23	44%	18	20%
Supervisor/teaching*	35	67%	18	20%
Social*	22	42%	71	81%
Pastoral	1	2%	9	10%
Mentor	6	12%	6	7%
Counselling/chaplain	4	8%	8	9%

Note: *p<0.05

Table 2: Mean scores and frequencies of psychological distress and burnout.

Measure		Total sample	Postgraduate	Medical student
Satisfaction with Life Scale (SWLS)				
Wellbeing	Mean score, M (SD)	23.6 (7.4)	23.4 (7.3)	23.7 (7.4)
	“Slightly satisfied”, “satisfied” or “extremely satisfied” with life, N (%)	86 (70)	34 (74)	52 (68)
Depression Anxiety and Stress Scale (DASS-21)^a				
Depression	Mean score, M (SD)	5.7 (5.7)	5.8 (5.9)	5.6 (5.6)
	“Moderate–extremely severe”, N (%)	39 (31)	12 (26)	26 (32)
Anxiety	Mean score M (SD)	4.6 (4.6)	4.1 (4.6)	4.9 (4.6)
	“Moderate–extremely severe”, N (%)	39 (31)	12 (26)	27 (34)
Stress	Mean score M (SD)	7.5 (5.4)	8.2 (5.8)	7.2 (5.2)
	“Moderate–extremely severe”, N (%)	34 (27)	14 (30)	20 (25)
Oldenburg Burnout Inventory—student version				
Exhaustion	Mean score M (SD)	2.5 (0.2)	2.5 (0.3)	2.5 (0.2)
	Clinical level, N (%)	113 (90)	40 (87)	73 (92)
Disengagement	Mean score M (SD)	2.5 (0.3)	2.5 (0.4)	2.5 (0.3)
	Clinical level, N (%)	110 (88)	41 (89)	69 (87)

Notes: ^a “Moderate–extremely severe” chosen from DASS-21 as indicator for likely clinically significant levels of symptoms. No statistical difference between group means or frequencies between student types. * $p \leq .05$, ** $p \leq .01$.

analyses (see Table 3). Age showed no significant correlation with any of the outcomes. There were no significant differences in outcome variables dependent on exposure to the earthquakes or mosque shootings. Neuroticism was positively correlated with depression, anxiety, stress and exhaustion, and negatively correlated with wellbeing and disengagement. Resilience showed the opposite pattern—positively correlated with wellbeing and disengagement but negatively correlated with depression, anxiety, stress and exhaustion.

Students who were concerned about their academic success reported higher depression

and stress scores, and lower wellbeing and disengagement scores. Having support was associated with positive outcomes. Those with whānau (family) support reported lower depression and stress scores, while those students with supervisor/teaching support reported lower anxiety scores. Social support was associated with higher life satisfaction and lower depression and stress scores. Male respondents reported higher exhaustion scores. Being in a relationship was associated with higher stress scores.

The strongest predictor variables were identified for each outcome, as shown in Table 4.

Table 3: Univariate associations between demographic, study, support and trauma exposure and primary outcomes in total sample.

Variable		Wellbeing ^a	Depression ^b	Anxiety ^b	Stress ^b	Exhaustion ^c	Disengagement ^c
Correlations							
Age		0.04	-0.08	-0.08	0.06	-0.18	0.18
Personality factors ^d	Agreeableness	.30*	-.22*	-0.12	-.26**	-0.17	0.14
	Conscientiousness	0.09	-0.04	0.13	.19*	-.21*	.23*
	Neuroticism	-.27**	.33**	.41**	.44**	0.16	-.35**
	Resilience ^e	.45**	-.43**	-.28**	-.30**	-.27**	.34**
ANOVA/F statistic							
Demographic information	Gender	0.82	2.28	0.51	0.41	9.78**(M)	1.22
	Ethnicity NZ European/ other	1.10	0.23	0.99	1.11	0.65	0.07
	In a relationship	0.47	0.51	0.15	6.41*(+)	0.14	1.21
	English is second language	0.25	0.74	1.07	0.05	0.90	0
	Born in New Zealand	0.83	0.56	1.33	0.44	1.61	0.94
Course factors	Closer to end of course	2.32	9.88**(+)	0.99	4.93*(+)	4.59*(+)	5.59*(-)
	Enrolment	0.07	1.66	1.55	0.04	0.46	0.66
	Concerned over academic success	20.35**(-)	15.95**(+)	3.07	5.06*(+)	3.35	12.00**(-)

Table 3 (continued): Univariate associations between demographic, study, support and trauma exposure and primary outcomes in total sample.

Variable		Wellbeing ^a	Depression ^b	Anxiety ^b	Stress ^b	Exhaustion ^c	Disengagement ^c
Presence of supports	Whānau support	2.06	8.08**(-)	3.27	6.43*(-)	1.79	0.01
	Academic/administrative support	2.38	3.34	1.83	0.97	1.12	3.06
	Supervisor/teaching support	1.33	3.67	4.57*(-)	0.70	1.75	1.63
	Social support	4.44*(+)	5.69*(-)	0.49	6.60*(-)	0.06	0.00
Exposure to earthquakes		0.37	3.68	1.28	0.73	1.06	0.05
Exposure to mosque shootings		0.02	1.77	2.72	1.88	0.57	0.08

Notes:

^aWellbeing measured by Satisfaction with Life Scale (SWLS).

^bDepression, anxiety and stress measured by Depression Anxiety and Stress Scale (DASS-21).

^cExhaustion, disengagement and burnout measured by Oldenburg Burnout Inventory—student version (OLBI-S).

^dNeuroticism, agreeableness and conscientiousness measured by BFI-10.

^eResilience measured by CD-RISC-10.

*p≤.05, **p≤.01. +/- indicates direction of association.

Table 4: Multivariable analysis of associations.

Outcome	Variables included in model	Adjusted R squared
Wellbeing ^a	Agreeableness (+) *, concerned over academic success (-) **, resilience (+) **	0.302
Depression ^b	Agreeableness (-) *, concerned over academic success (+) *, closer to end of course (+) *, resilience (-) **, presence of whānau support (-) (p=0.09)	0.287
Anxiety ^b	Neuroticism**, supervisor support (p=0.09)	0.172
Stress ^b	Agreeableness (-) *, conscientiousness**, presence of whānau support (-) **, neuroticism**, in a relationship (+) (p=0.06), resilience (-) (p=0.06)	0.326
Exhaustion ^c	Conscientiousness (-) *, gender (M)***, resilience (-) **	0.204
Disengagement ^c	Conscientiousness (+) *, neuroticism (-) **, concerned over academic success (-) **	0.217

Notes:

^a Wellbeing measured by Satisfaction with Life Scale (SWLS).^b Depression, anxiety and stress measured by Depression Anxiety and Stress Scale (DASS-21).^c Exhaustion and disengagement measured by Oldenburg Burnout Inventory—student version (OLBI-S). +/- indicates direction of association. Neuroticism, Agreeableness and Conscientiousness measured by BFI-10. *p≤.05, **p≤.01.

Concern over academic performance was associated with lower wellbeing scores, higher depression and lower disengagement scores. Resilience was associated with higher wellbeing, lower depression and lower exhaustion scores. Neuroticism was associated with higher anxiety and stress but lower disengagement. Conscientiousness was associated with higher stress and disengagement but lower exhaustion. Agreeableness was associated with increased wellbeing, and lower depression and stress.

Discussion

Medical students and postgraduate health sciences students completing this survey reported high levels of burnout and psychological distress, including symptoms of depression, anxiety

and stress. Despite this, over two thirds of our sample reported feeling satisfied with life, with no significant difference across postgraduates and medical students. A study comparing life satisfaction of medical students with other undergraduate students in Auckland reported that medical students were more satisfied than other students.²¹ Increased job certainty for medical students could be a factor, and possibly for some postgraduate students in our sample (37% were enrolled part time, possibly indicating ongoing employment).

Considering mean scores of psychological distress using the DASS-21 scale, our sample means (indicative of “normal” or “mild” symptoms of depression, anxiety or stress) were comparable with previous studies at single university campuses in Australia and New Zealand.^{14,22} The prevalence of clinical levels of depression and anxiety in this

medical student sample were also similar to global estimates of depression (32% from our sample vs 27–28% from two meta-analyses^{3,5}) and anxiety (our sample 34% vs 34%⁴) in medical students.

For postgraduate students, Evans et al.² reported the prevalence of “moderate to severe” depression and anxiety in a large international study to be approximately 39% and 40%, respectively. We found similar levels of “moderate to extremely severe” depression (41%) but lower levels of anxiety (26%) in our sample, possibly due to methodological factors (e.g., different measures of anxiety). The DASS-21 discriminates between anxiety and stress—“tension”, “irritability” and “difficulty relaxing” are reported in the stress subscale while the anxiety subscale measures symptoms such as “fear” and “panic”.¹⁶ This may explain the lower rates of anxiety reported in the current study compared to studies using more general anxiety measures that may incorporate symptoms of stress.

Exposure to the earthquakes or terrorist attack in our sample was not associated with psychological distress; however, the low sample size may underestimate this relationship. Other larger community studies have suggested that the cumulative effect of multiple traumatic events may still be a factor in small but functionally significant increases in distress symptoms.²³

Both of our samples reported high levels of burnout. Systematic reviews of burnout in medical students report variable prevalence of burnout in medical students of 7–75% depending on country-specific factors, cut off criteria and instrument used to measure burnout.²⁴ Frajerman et al. (2019) reported additional geographical variation with higher rates of burnout in Australia and New Zealand than in Europe and Latin America.²⁵ Our findings of 78% of the total sample meeting criteria for burnout may be explained by selection bias given our lower response rates and smaller sample sizes, as well as use of a different measure, but could also be an accurate estimate of burnout in this region. Farrell et al. (2019) found similar rates of burnout in medical students at a different New Zealand university using the OLBI-S.²⁶ However, the majority of studies use MBI-HSS to measure student burnout, which limits full comparison of our findings.

Our analysis of the combined sample of postgraduate students and medical students identified several factors associated with the primary outcomes of life satisfaction, psychological

distress and burnout including individual factors (e.g., demographics, personality and resilience) and systemic factors (e.g., supervisor support and progress through course). Male respondents reported higher exhaustion scores, which was also reported in a systematic review of burnout in Chinese medical students.²⁷ Whether this was related to selection bias of the males who responded to the survey or actual trends is unclear. In a study of whether gender and age impacted experience of workplace burnout, younger males were identified as having a higher risk of burnout while females had a bimodal risk profile.²⁸ Further investigation into gender differences in experience of burnout is needed.

Being in a relationship was also associated with higher stress scores, although respondents who reported having “social support” and “whānau support” tended to report higher levels of well-being and lower depression scores, which is more consistent with previous findings in the literature.^{1,27} Work, mental health difficulties and study burnout are known to impact on relationships; therefore, this finding may reflect a bidirectional effect. More postgraduate students reported English as a second language and not being born in New Zealand, as well as less whānau support. Larger sample sizes and subgroup analysis are needed to explore whether these demographic differences could impact on postgraduate students’ experience of burnout and psychological distress.

Neuroticism was associated with increased anxiety and stress, but less disengagement. Conscientiousness was associated with less exhaustion, but surprisingly increased stress and disengagement. Our study may have been underpowered to detect true associations between neuroticism and exhaustion and does not allow for causal conclusions given its cross-sectional design. A recent review on personality traits and job burnout concluded that neuroticism is associated with higher levels of burnout while conscientiousness is thought to be protective (though noted variation in findings); however, the impact of personality traits and student burnout is yet to be explored fully.²⁹

Resilience was associated with increased well-being, and less depression and exhaustion. The responses on the CD-RISC-10 in our study were similar to other estimates of resilience in undergraduate samples although lower than general community sample means.^{19,30} Resilience training has been adopted by many medical schools and training schemes. Some students may perceive this

approach as “individual blaming” when systemic factors of the learning environment are well recognised to impact on the development of burnout.^{8,11} Addressing both systemic and individual factors related to improving wellbeing may be more acceptable to students with already high personal and external expectations.

Apart from resilience, separate factors were identified as being most strongly associated with the domains of burnout compared to depression, supporting the understanding of the two concepts being related but independent.

This study has limitations. First, this was a self-selected sample, which may have disproportionately attracted individuals with experience of current or past distress or burnout. Conversely the survey sample may have missed participants with severe distress or burnout—potential response and sampling bias from the low response rate make it difficult to interpret the findings from this sample. The low response rate was worsened by an early termination of recruitment due to COVID-19. The resulting small sample size did not permit subgroup analyses. The cross-sectional study design

also limits the interpretation of associations and causality. However, comparison with other studies shows reasonable consistency and suggests validity in our findings.

To conclude, this first study to include both medical and postgraduate students in Aotearoa New Zealand found high levels of psychological distress and burnout in both medical students and postgraduate students. These findings are consistent with international literature. Exposure to two major adverse events was not related to current levels of psychological distress or mental health symptoms. Individual and contextual factors associated with wellbeing, psychological distress and burnout were identified; however, the contributing factors remain poorly understood. Longitudinal and qualitative studies are needed to explore causative factors relating to both the individual and institutions in order to better support tertiary students and mitigate the impacts of psychological distress and burnout during study. The additional impact of COVID-19 on student wellbeing and burnout is another area for study.

COMPETING INTERESTS

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