

“TIRED, WORN-OUT AND UNCERTAIN”:

Burnout in the New Zealand public
hospital senior medical workforce

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EXECUTIVE SUMMARY

This study examines the self-reported prevalence of burnout among senior doctors and dentists working at New Zealand's 20 district health boards (DHBs). It is based on the findings of a survey, conducted in November 2015, of 3740 members of the Association of Salaried Medical Specialists (ASMS), of whom 1487 (40%) responded. It is the first national study of its kind undertaken in New Zealand.

Key findings include:

- 50% of respondents report symptoms of burnout – ie, high levels of fatigue and exhaustion, as defined and measured by the internationally recognised Copenhagen Burnout Inventory (CBI).
- 42% of respondents attribute their burnout directly to their work.
- 16% of respondents attribute their burnout specifically to interactions with patients.
- The prevalence of burnout in New Zealand's senior doctors is higher than shown in other comparable international surveys of health sector workers.

The medical workforce is deemed particularly prone to burnout due to the stressful and emotionally demanding nature of health care provision and typically unrelenting high workloads. International research indicates doctors and health care workers are more susceptible to burnout than other professions and have higher rates of burnout when compared with the general public. Heavy workloads, long hours of work, shift work, on-call duties, and frustrations with poor quality leadership are some of the common factors associated with burnout in senior doctors.

Burnout is a concern not only because it poses risks to the health of those who suffer from it, but also because of known correlations between burnout and the quality of care and the risk of medical errors. Research also suggests the prevalence of burnout can have an impact on staff retention. Addressing burnout is therefore important for the health and well-being of patients and doctors alike. To that end, this study provides a critical first step by providing an understanding of the levels of burnout in the senior medical workforce across New Zealand.

The study finds strong correlations between burnout and hours of work, with results showing the greater the hours worked in a week, the higher the mean burnout score. Working more than 14 consecutive hours in the week prior to the survey was significantly associated with higher work-related burnout, as was not having had 24 hours free of work during that week.

Statistically significant differences were found in work- and patient-related burnout by specialty and by DHB. Those working in emergency medicine, dentistry and

psychiatry had the highest scores for work-related burnout, and those in psychiatry and dentistry had the highest scores for patient-related burnout. Generally, the medium-size DHBs (those with 101–200 ASMS members) had the highest prevalence rates for work-related burnout and overall burnout.

The prevalence of burnout is higher among females, with 59% reporting symptoms of burnout generally and 47% attributing burnout directly to their work, compared with 44% and 39% for males respectively. The prevalence of burnout tends to be higher in younger respondents, with 62% of those aged 30–39 scoring as burnt-out. While the prevalence of work-related burnout is still relatively high in those aged over 60 (35%), it is lower than the prevalence found in other age groups. The idea that burnt-out senior doctors may have already retired or reduced their participation in onerous duties (eg, on-call) deserves further consideration as there was notable mention of burnout and intent to retire in the qualitative comments analysed in the survey.

Increasing mean and burnout prevalence scores were strongly correlated with worsening self-rated health status, suggesting that burnout has a clear relationship with poor health, although directional causality cannot be inferred from the findings. Given the high rates of ‘presenteeism’ found in another recent study on the DHB-based ASMS membership, and the known correlations between ill health, burnout and presenteeism behaviour, this relationship also warrants further examination.

Qualitative comments provided by 51% of survey respondents indicate frustrations with management negatively impact on satisfaction with work, in addition to intense and unrelenting workloads, under-staffing and onerous on-call duties. Few respondents to the survey attribute their burnout to interactions with patients; most reported enjoyment and feelings of fulfilment in relation to their patient contact.

The findings from this survey provide an important insight into the psychosocial health of senior doctors and dentists working in New Zealand’s public health sector. The high proportion of this critical workforce currently feeling ‘tired, worn-out and uncertain’ is of great concern.

Further research is needed to consider the extent to which these high levels of burnout are affecting patient care and whether burnout is influencing other workforce trends, including retirement intentions. In the meantime, these findings act as a clear call to the Government, health policymakers and DHB chief executives to urgently address burnout and assist those who are already afflicted. The clear emphasis on staffing levels, hours of work and poor resourcing suggests major changes to better resource DHBs and improve management culture are required.

Glossary

Personal burnout	The degree of physical and psychological fatigue and exhaustion experienced by the person overall, including work-related burnout, patient-related burnout and non-work-related factors.
Work-related burnout	The degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work.
Patient-related burnout	The degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his/her work with patients.

INTRODUCTION

Burnout is an issue of concern for doctors and other medical professionals. The medical workforce is deemed particularly prone to burnout due to the stressful and emotionally demanding nature of health care provision and typically unrelenting high workloads. Research suggests that doctors and health care workers are more susceptible to burnout than other professions (Rossler 2012) and have higher rates of burnout when compared with the general public (Shanafelt, Boone et al. 2012). Connections have also been made between burnout and long hours of work (Chou, Li et al. 2014), presenteeism (Thun, Fridner et al. 2014), shift work and on-call duties (Ekstedt, Soderstrom et al. 2006; Shirom, Nirel et al. 2010; Amofo, Hanbali et al. 2015). Other contributing factors include feelings of low control and frustrations with poor quality leadership (Borritz, Bultmann et al. 2005; Borritz, Christensen et al. 2010).

Burnout is a concern not only because it poses a risk to the health of those suffering from burnout (Borritz, Christensen et al. 2010; Kakiashvili, Leszek et al. 2013) but also because of known correlations between burnout and the quality of care (Firth-Cozens and Greenhalgh 1997; Shirom, Nirel et al. 2006; Klein, Grosse Frie et al. 2010) and the risk of medical errors (Fahrenkopf, Sectish et al. 2008; Chen, Yang et al. 2013). Research into medical error and burnout in American surgeons suggests a strong correlation between the likelihood of reporting a major medical error and screening positively for any of the three measures of burnout as determined by the Maslach Burnout Inventory (Shanafelt, Balch et al. 2010). Tziner, Rabenu et al. (2015) also note a strong correlation between burnout and increasing turnover intentions. Understanding and addressing levels of burnout in the medical workforce is therefore likely to provide significant benefits for the general well-being of the medical workforce, as well as improving the quality of patient care.

What is burnout and how to measure it?

While burnout is not formally recognised as a mental illness, it is specified in the International Classification of Diseases (10th revision) as “factors influencing health status and contact with health services” (Z00–Z99) and as a state of “vital exhaustion” (Z73.0) encompassing both physical and emotional dimensions (Kakiashvili, Leszek et al. 2013). In the wider literature, burnout is variously described as “a particular type of prolonged occupational stress” (Borritz, Christensen et al. 2010 p964) or “psychological strain representing a process of depleting personal coping resources” (Shirom, Nirel et al. 2010 p541). Additional symptoms may include physical tiredness, sleep disturbances (Ekstedt, Soderstrom et al. 2006), cynicism, disengagement, and low reported job satisfaction (Maslach

and Jackson 1986; Amofo, Hanbali et al. 2015). While the symptoms of burnout are often mistaken and treated as if for depression, Kakiashvili, Leszek et al. (2013) note that there are important differences between depression and burnout not only in terms of how best to treat burnout but also in terms of some of the potential serious health implications that may result.

While burnout is well recognised as a phenomenon, however, some have noted that there is currently no clinically accepted means of establishing or grading the severity of burnout (Bianchi 2015). This means in practical terms that while someone may screen as 'burnt-out' through the use of various screening tests, further psychological testing is recommended to clinically assess and grade the severity of the indicated burnout. Similarly, some authors have queried an over-reliance on questionnaires and scoring systems for attempting to establish rates of burnout in populations. Van Mol, Kompanje et al. (2015), for example, note that studies which rely on these measures alone have no way of probing underlying reasons that may be driving burnout. They recommend additional qualitative research to "provide insights into the thoughts and behaviours in relation to a stressful work environment" (p16). This study, accordingly, involves analysis of qualitative comments in order to probe possible contributing factors to burnout as well as to provide context for the statistical trends.

According to the Maslach Burnout Inventory (MBI), a 22-item test developed by Maslach and Jackson in 1981, burnout is the consequence of emotional exhaustion, depersonalisation and a sense of reduced personal accomplishment (Maslach and Jackson 1986). The MBI remains the most commonly used tool to screen for burnout. Nevertheless, there have been a number of criticisms of the MBI, including the relationship between emotional exhaustion, depersonalisation and personal accomplishment; the fact that it is only available commercially; and its applicability to different cultural and workplace contexts (Winwood and Winefield 2004; Kristensen, Borritz et al. 2005; Schaufeli and Taris 2005).

A more recent screening tool is the Copenhagen Burnout Inventory (CBI), which was developed by Danish researchers Borritz and Kristensen for a five-year prospective intervention study on burnout in the human service sector in Denmark (the PUMA¹ study). The CBI was explicitly generated to improve on issues they discerned with the MBI (Kristensen, Borritz et al. 2005). In contrast to the MBI, the CBI attempts to simplify and refine the concept of burnout to a state of emotional and physical exhaustion. It comprises a questionnaire, divided into three discrete

¹ 'PUMA' is the Danish acronym for 'Project on Burnout, Motivation and Job Satisfaction'.

sections, with three separate scales: personal burnout, work-related burnout and client-related burnout.

In this conceptualisation of burnout, personal burnout is assessed on the degree to which respondents feel tired, worn out, or physically and emotionally exhausted, regardless of perceived cause. Work-related burnout is a measure of the “degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to their work” (Kristensen, Borritz et al. 2005 p197). Client-related burnout is “the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to their work with clients” (ibid). This ‘client’ or ‘patient’ related aspect is deemed to be a second tier of work-related issues, but one which has a focus on the impact of ‘people work’. Only those who work face-to-face with clients, or in the medical context, patients, are required to answer this section of the inventory.

The rationale for having three distinct scales, based on three distinct sets of questions, is that they can be used in different domains (all persons, persons who do paid work, and persons who do ‘people’ work). Depending on the groups or populations being studied and the information being sought, some studies may use only one or two of the scales. This study has used all three scales to gain an understanding of not only the extent of burnout that senior doctors attribute specifically to their work but also the extent of their overall levels of burnout. There is now a considerable body of research confirming the validity of the CBI as a screening measure for burnout as well as its applicability in different countries (Fong, Ho et al. 2014), including New Zealand (Milfont, Denny et al. 2008). To date, however, there have been no studies using the CBI to assess levels of burnout in senior doctors in New Zealand.

Burnout in the health care literature

There is a considerable literature on burnout in health care workers. While most of the published research uses the MBI, a growing corpus of recent research is using the CBI, partly because of its ability to examine the relative impact of conditions associated with work and with interactions with clients, broadly defined, as potential drivers of the primary state of exhaustion. In a recent paper by Chou, Li et al. (2014), their research suggests doctors are particularly at risk of burnout due to “time pressure, delayed gratification, limited control and a loss of autonomy, conflict between career and family, feelings of isolation as well as research and teaching activities” (p2). Their study finds the rates of burnout in doctors to be lower than burnout in nurses and physician assistants but the second highest in terms of patient-related burnout.

While the baseline findings from the PUMA study found burnout rates in doctors to be lower than levels experienced by midwives, research by Shanafelt, Boone et al. (2012) found that 46% of doctors in the United States were likely to be experiencing burnout in some form, and that burnout was more common among doctors than any other occupation. Of the doctors involved in their study, 45.8% had at least one symptom of burnout compared with 23% of the general US population. They also found that those working in front line specialties such as family medicine, general internal medicine, and emergency medicine were more likely to experience burnout than others.

Alongside Shanafelt's corpus of research into burnout in surgeons using the MBI (eg, Shanafelt, Balch et al. 2010; Shanafelt, Oreskovich et al. 2012), there has been considerable research into levels of and contributing factors towards burnout in those working in emergency medicine, including a paper using the CBI to assess burnout in French emergency physicians (Estryn-Behar, Doppia et al. 2011). Recent reviews of such literature conclude that hours of work play a significant contributing factor to burnout (Arora, Asha et al. 2013), and that experience and autonomy play a significant role in ameliorating perceptions of stress associated with working in emergency departments (Johnston, Abraham et al. 2016). Other research has focused on levels of burnout in gerontologists (Sanchez, Mahmoudi et al. 2015), radiation oncologists (Leung, Rioseco et al. 2015), mental health workers (Rossler 2012) and physiotherapists (Sliwinski, Starczynska et al. 2014), as well as intensivists (Coomber, Todd et al. 2002; van Mol, Kompanje et al. 2015) and Australian dentists (Winwood and Winefield 2004).

Rosler (2012) notes that psychiatric workers, including psychiatrists, are more exposed to certain workplace stressors than other health professionals. In particular, he highlights the impact of the often demanding relationships with mental health patients as well as the challenges associated with working in multidisciplinary teams with other mental health workers. He further cites research by Fothergill, Edwards et al. (2004) which notes the psychological impact of patient suicide on psychiatrists, as well as the stresses associated with adhering to the varied legal requirements that govern mental health issues.

Other researchers have noted connections between fatigue, sleep disruption, stress and perfectionism as contributing factors to burnout. With respect to the latter, research by D'Souza, Egan et al. (2011) found both high levels of stress and perfectionism were indicative factors in scoring highly on the CBI across all three measures of burnout. They further found that individuals displaying high levels of perfectionism were also likely to have high levels of stress which in turn actively predisposed those individuals to burnout. Chen, Yang et al. (2013) found strong correlations between physicians who worked more than 65 hours and had been

called out more than 41 times per week and burnout when compared with those who worked fewer hours and had fewer call-outs.

There is considerable evidence to suggest connections between hours of work and burnout (Kuerer, Eberlein et al. 2007; Chou, Li et al. 2014; Amofo, Hanbali et al. 2015). Research by Shanafelt, Boone et al. (2012), for example, found that those doctors who worked the highest hours in a week were likely to have the highest burnout scores. Similar trends were found with higher prevalence of emotional exhaustion in health care workers who regularly undertook shift work (Wisetborisut, Angkurawaranon et al. 2014). Other research has noted the impact of the perceived quality of leadership on burnout levels (Shanafelt, Gorringer et al. 2015), and considerable research has attended to the importance of feelings of autonomy in mitigating burnout (Shirom, Nirel et al. 2006; Shirom, Nirel et al. 2010) as well as the importance of role clarity and control (O'Driscoll and Beehr (2000) note this research is on accountants).

Rosler (2012) makes the important observation that while the medical profession has certain stressors reflecting the long hours of work and difficulties associated with challenging and emotionally draining patient-care situations, the impact of the organisational context of medicine cannot be ignored as a contributing factor in the propensity for this workforce to experience burnout. He notes that “economic objectives have priority over medical values in health care. This is a perspective that conflicts with almost all values of importance during the training of physicians. These factors contribute to a cycle of stress and reduced quality of care” (p568). In New Zealand, the Association of Salaried Medical Specialists (ASMS) has long noted the relative under-investment in the senior medical workforce, which has led to entrenched shortages, exacerbated by an aging workforce and increasing health needs (ASMS 2014).

To date, no studies have screened for burnout in a cross-specialty, national survey of a particular cohort of the medical workforce. Arora, Asha et al. (2013), for example, recommend the need for burnout research that is multi-centre and preferably conducted at a national level using a validated instrument so as to facilitate comparisons of burnout scores. This study meets this challenge by exploring the prevalence of burnout as measured by the CBI in senior doctors and dentists working in New Zealand's 20 district health boards (DHBs). This study also explores the links between burnout and hours of work, and burnout and other variables including gender, age, and length of time in the workforce.

METHODOLOGY

A total of 3740 DHB-based members of the ASMS were asked by email to take part in an anonymous online survey in November 2015. The survey, hosted by Survey Monkey, was open for one month and four reminders were sent to encourage survey completion. Participation was voluntary and no incentives for participation were provided.

The survey used the 19-item CBI questionnaire measuring burnout according to a five-item Likert scale assessing frequency of experiencing various feelings and events eg, how often do you feel tired? The questionnaire was divided into three independent sets of questions on (a) personal burnout, (b) work-related burnout, and (c) patient-related burnout. The term 'patients' was substituted for 'clients', as advised in the inventory (see Appendix 1 for a full list of questions).

Personal burnout (ie, overall individual burnout) was defined as the degree of physical and psychological fatigue and exhaustion experienced by a person and involved six questions, such as 'How often do you feel tired?'

Work-related burnout was defined as the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his or her own work and involved seven questions, such as 'Is your work emotionally exhausting?'

Patient-related burnout was defined as the degree of physical and psychological fatigue and exhaustion that is perceived by the person as related to his or her work with clients and involved six questions, such as 'Do you find it hard to work with patients?' Only those with direct face-to-face contact with patients were invited to participate in the patient-related burnout section.

The inventory has an inbuilt scoring regime where response categories 'Always', 'Often', 'Sometimes', 'Seldom' and 'Never/Almost never' are scored from 100 (Always) to 0 (Never/Almost never). The possible score range for all scales is 0-100. Scores ≥ 50 in each of the three scales are classed as signalling a high level of burnout. Prevalence scores were calculated by assessing the percentage of individuals who score as 'burnt-out' (ie, with scores ≥ 50) as a percentage of the overall respondents. Mean burnout scores were then calculated by averaging the scores for each line of questioning (see Appendix 1) and taking an overall average of the score (see instructions on the CBI in Kristensen, Borritz et al. 2005).

Additional questions were based on the Australian Medical Association's Risk Assessment checklist into hours of work, including whether or not participants had worked more than 24 consecutive hours, and whether or not they have a period of rest of less than 10 hours (Australian Medical Association 2005). Respondents were

also asked to estimate total hours of work for the week prior to completing the survey. Hours of work were defined as including standard hours worked, private work, hours on-call (including time on-call but not called in), and any time spent doing administrative tasks at home, including email.

Independent variables were taken from responses to the World Health Organization’s self-health assessment tool (a single item measure of health) and demographic data including gender, age (according to five categories), length of time worked in New Zealand (according to five categories), full-time equivalent (FTE) (a formalised measure of weekly hours of work), primary DHB and specialty. Specialties were summarised according to 11 broad specialty groupings to aid statistical analysis. DHBs were also summarised into four categories based on total membership numbers as either small (fewer than 100 members), medium (101–200 members), large (201–400 members) or very large (more than 400 members). This breakdown and the associated DHBs are detailed in Table 1.

Table 1: DHB groupings by size of membership

DHB	Total ASMS members	Grouping
Wairarapa	29	Small ≤100
West Coast	32	
South Canterbury	40	
Whanganui	42	
Tairāwhiti	49	
Lakes	76	
Taranaki	89	
Hawke’s Bay	120	Medium 101–200
Nelson-Marlborough	131	
Hutt Valley	131	
MidCentral	143	
Northland	151	
Bay of Plenty	161	
Southern	270	Large 201–400
Waikato	332	
Capital Coast	334	
Counties Manukau	412	Very large >400
Waitemata	418	
Canterbury	502	
Auckland	780	

Quantitative data analysis

Data from the three CBI scales were analysed for internal and criterion-related validity using Cronbach's alpha (α) and inter-item and item-total correlations. Demographic data including gender, age, length of time working in New Zealand, specialty and place of work were summarised and described. Associations between the mean and prevalence scores on the three burnout scales, hours of work, responses to the risk assessment checklist questions, and the independent demographic variables specified above were tested using Spearman's rho, chi-square and one-way analysis of variance (ANOVA) as appropriate on SPSS (version 23.0). Variables showing significant univariate associations with high-level burnout were entered into forwards and backwards stepwise logistic regressions to determine the presence of significant independent associations. These results are summarised using odds ratios (ORs) and 95% confidence intervals (CIs).

Qualitative data analysis

Data from the comments section were imported into NVivo pro (version 11), read through in detail and open coded according to 41 detailed recurring themes emerging from the comment material. The qualitative data were subsequently re-read and re-coded into five nested macro-themes and sub-themes by examining connections between themes and considering how frequently themes were expressed. Patterns arising from the correlation analysis in the quantitative data were also explored by cross-cutting the comments left by respondents according to key variables: gender, age-group, selected specialties with high burnout scores, and selected DHBs with high burnout scores. This cross-cut qualitative material was further re-read and re-coded according to the revised macro-themes and sub-themes, and comparative analysis was performed between categories of comments to examine whether there were any differences in how themes were expressed or the frequency of thematic expression. Comments selected for inclusion in the final report were those that best expressed the various themes. Comments were transcribed directly, and where sections were omitted, ellipses ('...') were used to signify the break. Any words replaced or altered to preserve anonymity or correct for tense or sense are noted within square brackets ('[]').

RESULTS

A total of 1487 members of the 3740 DHB-based members responded to the survey in its entirety (40% response rate). Of these, 752 respondents left comments for qualitative analysis (51%). The demographic composition of the research participants is summarised in Table 2. The gender and DHB profile of the participants was a close match with the gender and DHB spread of the total ASMS membership; a chi-square goodness of fit test did not show any significant difference between observed and expected numbers (49.8, $p=0.096$). Most participants were male (59.8%), aged between 40 and 49 (39.1%), and had worked in New Zealand for between 15 and 30 years (44.2%).

Table 2: Demographic characteristics of respondents

Gender	n	%
Male	857	59.8
Female	575	40.2

Age group	n	%
20–29	3	0.2
30–39	164	11.4
40–49	563	39.1
50–59	500	34.7
60 and over	211	14.6

Years worked in New Zealand	n	%
Less than 5 years	144	10.0
5–14 years	493	34.2
15–30 years	637	44.2
More than 30 years	167	11.6

Self-rated health status	n	%
Excellent	308	21.0
Very Good	595	40.6
Good	401	27.4
Fair	142	9.7
Poor	18	1.2

Specialty	n	%
Anaesthesia	163	11.4
Dentistry	32	2.2
Diagnostic & Interventional Radiology	73	5.1
Emergency Medicine	102	7.1
General Practice	11	0.8
Internal Medicine	441	30.8
Obstetrics/Gynaecology	61	4.3
Paediatrics	137	9.6
Pathology	45	3.1
Psychiatry	197	13.8
Surgery	168	11.7

DHB	n	%
Auckland	263	18.4
Bay of Plenty	49	3.4
Canterbury	154	10.7
Capital & Coast	114	8.0
Counties Manukau	131	9.1
Hawke's Bay	47	3.3
Hutt Valley	44	3.1
Lakes	29	2.0
MidCentral	63	4.4
Nelson Marlborough	52	3.6
Northland	64	4.5
South Canterbury	17	1.2
Southern	92	6.4
Tairāwhiti	23	1.6
Taranaki	36	2.5
Waikato	119	8.3
Wairarapa	14	1.0
Waitemata	104	7.3
West Coast	10	0.7
Whanganui	8	0.6

Hours of work

Table 3 summarises the hours of work for the respondents of the week immediately prior to completing the survey. The high average weekly hours of work may reflect long periods of being on-call but not physically called into the hospital. The hours of private work were low and, on average, most respondents were employed full time.

Table 3: Hours of work

Full time equivalent (FTE)		
Mean	0.9	
Median	1	
Range	Min 0.2	Max 1.7
Total hours worked*		
Mean	61.5	
Median	55	
Range	Min 0	Max 168
Private hours worked		
Mean	5.3	
Median	0	
Range	Min 0	Max 100
24-hour break free of scheduled work	n	%
Yes	981	67.0
No	484	33.0
Period of rest between work of less than 10 hours	n	%
Yes	680	46.9
No	771	53.1
Worked more than 14 consecutive hours	n	%
Yes	683	46.6
No	784	53.4

* This figure includes private work, hours on-call (including time on-call but not called in), and any time spent doing administrative tasks at home including email.

Burnout scores

The questionnaire's reliability was assessed by Cronbach's α for each dimension, with resulting scores of 0.89, 0.89 and 0.87 for personal, work-related and patient-related burnout respectively, indicating that items within the three scales were well correlated. This compares favourably with the reliability scores in Kristensen, Borritz et al. (2005) (Cronbach's α 0.87, 0.87 and 0.85; n=1898, 1910 and 1752) and Chou, Li et al. (2014) (Cronbach's α 0.93, 0.93 and 0.92; n=1392, 1329 and 1329). The burnout scores across the three dimensions were strongly correlated ($p < 0.001$), with correlation coefficients r_s 0.820 for personal and work-related burnout, r_s 0.451 for personal and patient-related burnout, and r_s 0.556 for work- and patient-related burnout.

The CBI was used to ascertain the proportion of individual ASMS members who were scored as likely burnt-out (ie, had scores ≥ 50) as well as calculating the mean burnout scores for the survey population to summarise the overall level of burnout within the ASMS sample. Proportionately, 50.1% of the respondents identified as having high personal burnout, while only 15.7% attributed their burnout to interactions with patients. These proportionate burnout scores are detailed in Table 4. The proportion of ASMS members with likely burnout is significantly higher for all scales except patient-related burnout when compared with the scores of the PUMA study participants. Female respondents were proportionately significantly more burnt-out than their male counterparts for personal and work-related burnout.

Table 4: Proportion of ASMS respondents with high degree of burnout by scale

	% of ASMS participants with burnout	% of PUMA participants with burnout	p	% of female ASMS participants with burnout	% of male ASMS participants with burnout	p
Personal burnout	50.1%	22.2%	<0.001	59.4%	43.9%	<0.001
Work-related burnout	42.1%	19.8%	<0.001	46.9%	39.0%	0.003
Patient-related burnout	15.7%	15.9%	0.563	17.0%	15.6%	0.260

The mean ASMS burnout scores are detailed in Table 5 with comparative mean burnout scores from other studies using the CBI, including the baseline PUMA scores. Burnout scores for 'chief doctors' (the Danish equivalent to medical specialist – Kristensen *pers comm*) taken from the PUMA study findings are also detailed for comparison. The differences in mean burnout scores between the baseline PUMA study and the ASMS results are all statistically significant ($p < 0.001$),

with patient/client-related burnout slightly less so ($p=0.034$). Appendix 1 gives a detailed breakdown of all the mean ASMS burnout sub-scale scores against the PUMA scores.

Table 5: Mean burnout scores compared with the baseline scores from the PUMA study and additional international studies on health care workers using the CBI

	ASMS survey N=1487	PUMA study [N=1890] ¹	PUMA chief doctors [N=37] ¹	Australian dentists [N=312] ²	U.S. paediatric health care workers [N=206] ³	Taiwanese physicians [N=101] ⁴	Australian clinical psychologists [N=87] ⁵	German clinicians in surgery [N=1311] ⁶
Mean (Standard Deviation)								
Personal burnout	47.4 (17.5)	35.9(16.5)	31.3	40.9 (19.9)	34.2 (16.2)	43.3 (18.6)	25.89	47.2 (17.8)
Work-related burnout	44.0 (19.0)	33.0 (17.7)	29.2	36.6 (20.3)	37.0 (14.2)	41.5 (19.0)	33.84	Not used
Patient-related burnout	29.5 (17.9)	30.9 (17.6)	25.8	33.3 (20.1)	20.3 (16.8)	38.6 (16.7)	39.19	29.1 (16.3)

¹ Kristensen, Borritz et al. 2005, ² Winwood and Winefield 2004, ³ Jacobs, Nawaz et al. 2012, ⁴ Chou, Li et al. 2014, ⁵ D'Souza, Egan et al. 2011, ⁶ Klein, Grosse Frie et al. 2010

Table 6 details associations between the mean burnout scale scores and the demographic information recorded. Female respondents had significantly higher mean burnout scores for all measures of burnout ($p<0.001$) except for patient-related ($p=0.395$). The same trend applied on the proportionate measures of all the scales of burnout ($p<0.001$, $p=0.003$ and $p=0.260$ for personal, work- and patient-related burnout respectively). Those with a longer length of time working in the New Zealand public health system had significantly lower burnout scores ($p<0.001$) for all scales of burnout except patient-related ($p=0.409$).

Those in the 30–39-year age group had the highest mean personal burnout scores of all the age groups (mean=53, $p<0.001$), with burnout scores improving concurrent with increasing age. Female respondents in the 30–39-year age bracket ($n=88$) had very high prevalence of personal burnout (70.5%). These trends, as they apply to personal burnout by age and gender, are displayed in Figure 1 and Figure 2.

Table 6: Mean burnout scores across three scales and demographic variables

Variable	Personal burnout			Work-related burnout			Patient-related burnout		
	Mean	SD	p<0.001	Mean	SD	p<0.001	Mean	SD	p=0.395
Gender									
Female	51.4	16.7		47.1	18.4		29.9	17.5	
Male	45.1	17.6		42.7	19.1		29.0	18.1	
Self-rated health status	Mean	SD	p<0.001	Mean	SD	p<0.001	Mean	SD	p<0.001
Excellent	36.6	16.7		34.7	18.0		24.1	16.6	
Very good	44.6	15.3		41.5	17.2		27.8	16.9	
Good	53.8	14.2		49.4	16.6		32.4	17.3	
Fair	63.4	15.5		60.5	18.1		38.6	21.6	
Poor	70.1	17.6		63.1	19.6		30.9	17.6	
Years worked in NZ	Mean	SD	p<0.001	Mean	SD	p<0.001	Mean	SD	p=0.409
Less than 5 years	47.8	17.6		43.8	19.2		25.5	18.8	
5–14 years	49.9	17.1		46.7	19.0		29.6	17.9	
15–30 years	47.7	17.3		45.0	18.4		31.2	17.7	
More than 30 years	40.4	17.5		36.3	18.4		25.5	16.8	
Age group	Mean	SD	p<0.001	Mean	SD	p<0.001	Mean	SD	p=0.485
20–29	50.0	15.0		46.4	6.2		23.6	21.4	
30–39	53.0	17.4		47.6	17.8		28.6	18.0	
40–49	49.9	17.0		46.2	18.8		29.6	17.6	
50–59	46.7	16.5		44.6	18.8		30.4	18.1	
60 or over	39.8	18.6		36.9	19.0		27.2	18.0	
Medical specialty	Mean	SD	p=0.173	Mean	SD	p<0.001	Mean	SD	p<0.001
Anaesthesia	44.7	16.3		40.0	16.5		24.4	16.2	
Dentistry	47.7	14.6		47.0	16.9		32.8	16.4	
Diagnostic and Interventional Radiology	49.8	14.9		44.8	16.2		23.8	14.0	
Emergency Medicine	50.2	15.6		51.3	18.1		32.7	17.7	
General Practice	39.8	19.4		33.4	21.7		27.3	19.2	
Internal Medicine	47.7	18.1		44.1	19.8		29.2	17.8	
Obstetrics/Gynaecology	47.1	18.3		42.7	20.3		24.6	16.2	
Paediatrics	46.7	16.5		41.1	17.5		29.2	18.4	
Pathology	50.5	19.3		45.6	19.0		25.4	13.6	
Psychiatry	49.5	17.6		48.1	19.0		35.9	18.6	
Surgery	46.1	19.0		44.3	19.5		28.1	18.0	

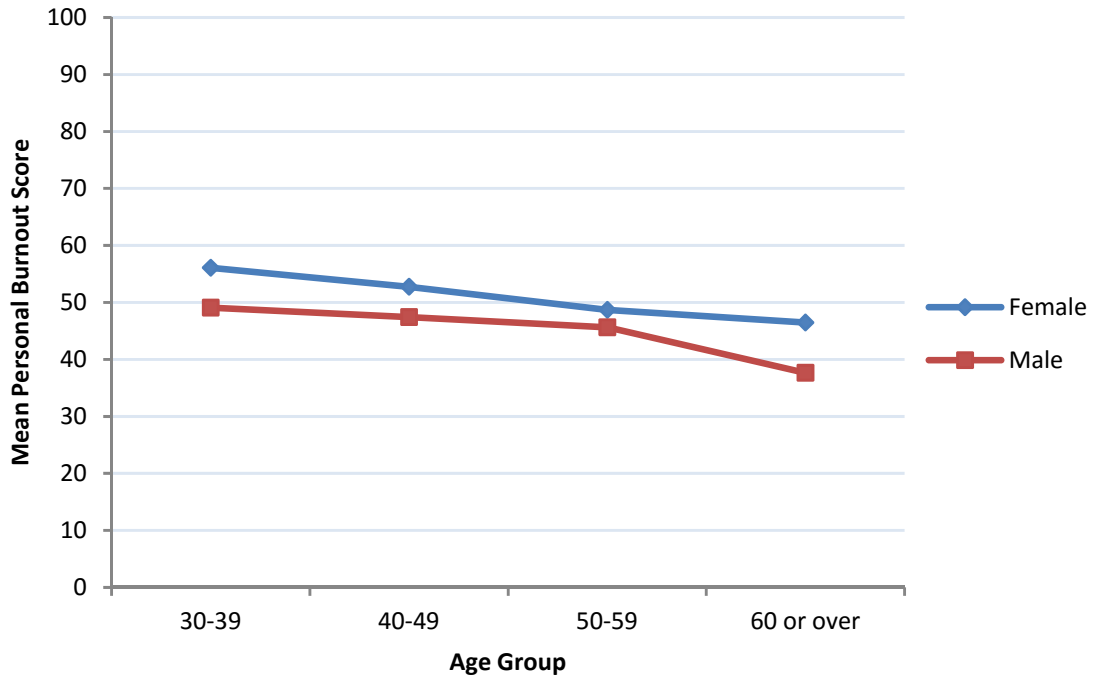


Figure 1: Mean personal burnout scores by gender and age group²

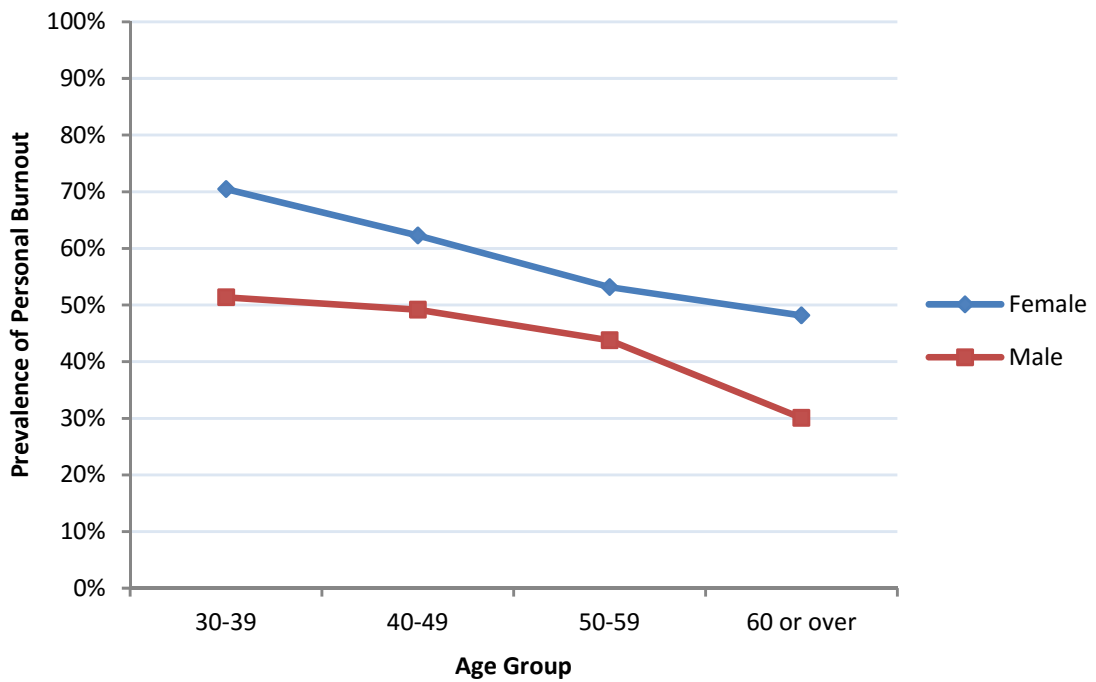


Figure 2: Prevalence of personal burnout (%) by gender and age group

² Data for the 20–29 age group have been excluded due to low numbers (3 individuals) in this age category

Mean burnout scores across all three scales were significantly associated ($p < 0.001$) with worsening self-rated health status, with those scoring themselves with poor health having significantly higher mean burnout scores. The same trend for gender and burnout applied, with female respondents displaying higher burnout scores both in terms of mean scores (Figure 3) and prevalence rates than their male counterparts for all health status categories except 'poor' health status, where the prevalence rate for women and personal burnout declines to 75% compared with 85.7% for men (Figure 4).

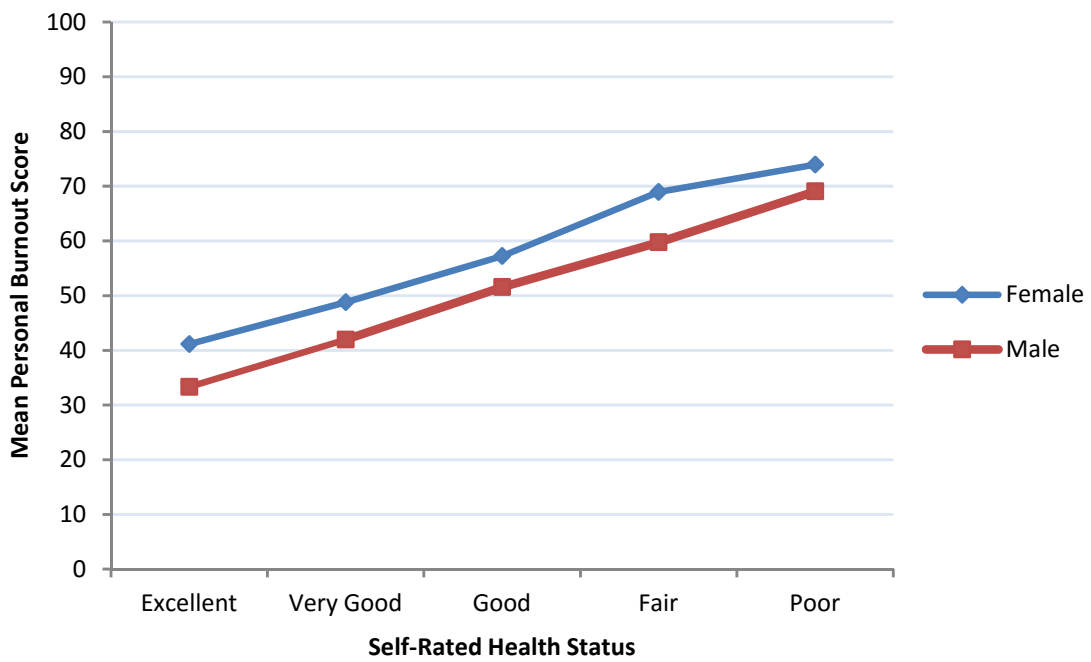


Figure 3: Mean personal burnout score by gender and self-rated health status

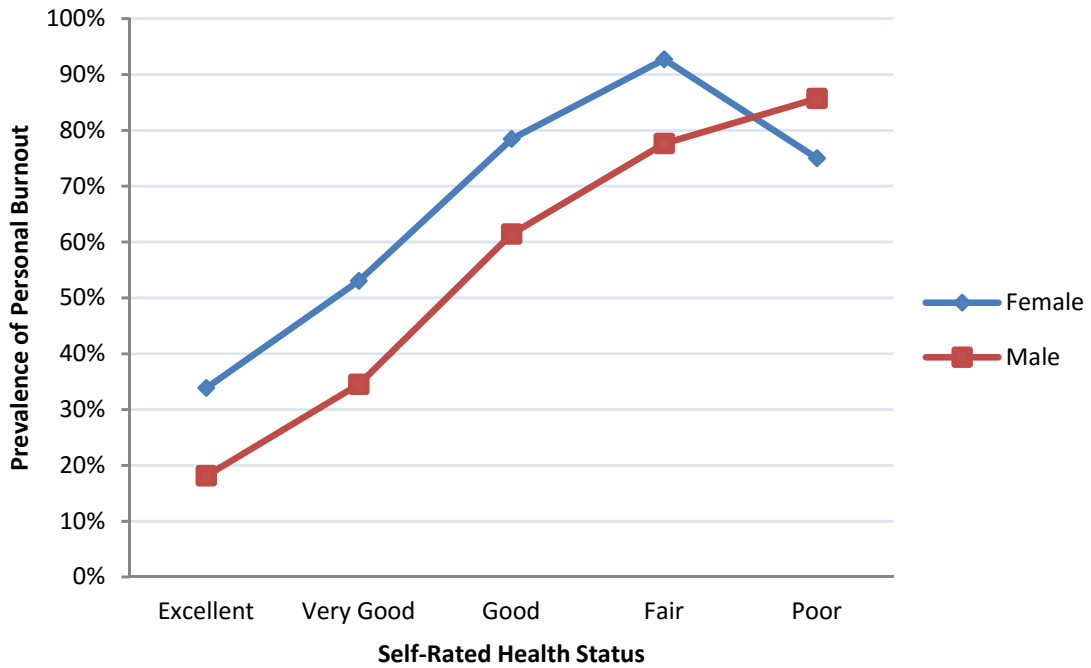


Figure 4: Prevalence of personal burnout (%) by gender and self-rated health status

There were significant associations between mean burnout and specialty with work- and patient-related burnout ($p < 0.001$) but no significant difference across specialties for mean personal burnout ($p = 0.173$). Those working in emergency medicine and psychiatry had the highest mean work-related burnout scores (mean = 51.3 and 48.1 respectively), and those working in psychiatry and dentistry had the highest mean patient-related burnout scores (mean = 35.9 and 32.8 respectively). Figure 5 displays mean work-related burnout by personal burnout and specialty, and Figure 6 shows patient-related burnout by personal burnout and specialty.

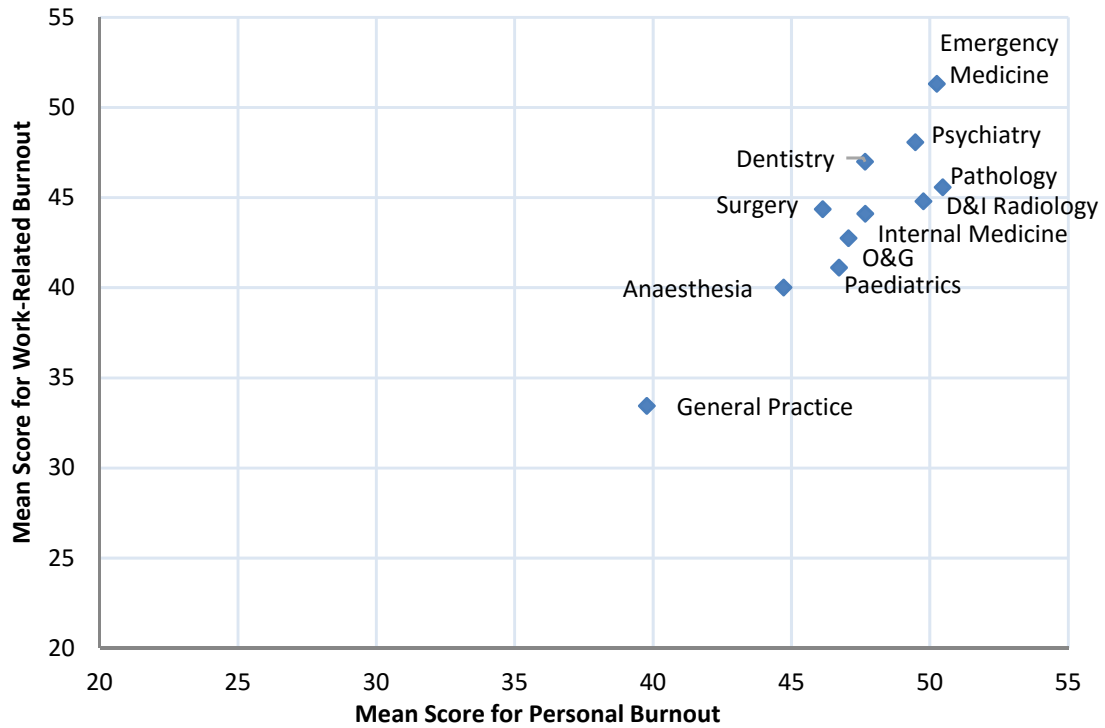


Figure 5: Mean work-related and personal burnout by medical specialty

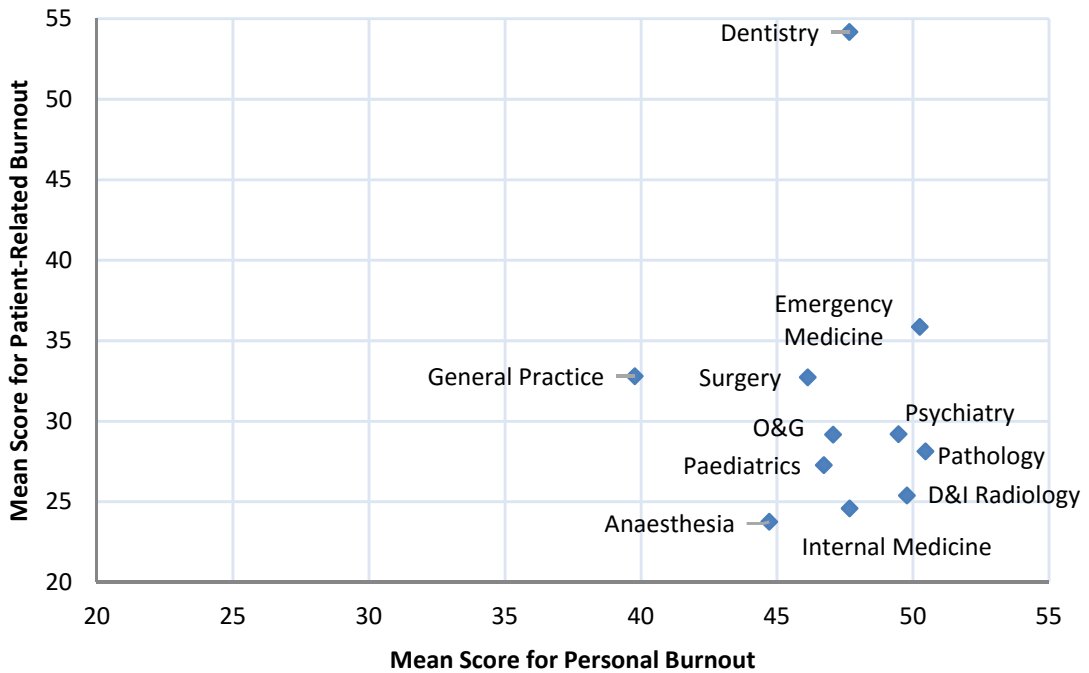


Figure 6: Mean patient-related and personal burnout by medical specialty

There were statistically significant differences between mean work-related burnout scores by DHB ($p=0.013$) but no significant differences between mean personal and patient-related burnout scores ($p=0.075$ and $p=0.258$ respectively). This pattern was the same for the prevalence of individuals with high levels of burnout, but the significance was stronger for work-related burnout ($p=0.002$). The mean scores ranged from 25 to 50 for work-related burnout, and in terms of prevalence, 0% to 61.5% for the same scale of burnout. It is important to note that the 0% prevalence score came from a DHB with a very small number of respondents ($n=8$ from a possible 40). When grouped according to the numbers of ASMS members present at each DHB, a pattern for DHBs with members numbering between 100 and 200 emerged: these DHBs had the highest scores across all three measures of burnout. Differences between work- and patient-related burnout were statistically significant, however ($p=0.002$ and $p=0.032$ respectively). Mean burnout scores grouped by size of DHB according to numbers of ASMS members are outlined in Table 7.

Table 7: Mean burnout scores by DHB grouped according to numbers of members

Grouped DHBs by number of ASMS members	Personal burnout Mean (SD)	$p=0.061$	Work-related burnout Mean (SD)	$p=0.002$	Patient-related burnout Mean (SD)	$p=0.032$
≤100	46.4 (18.4)		44.9 (20.6)		28.1 (17.4)	
Wairarapa						
West Coast						
South Canterbury						
Whanganui						
Tairāwhiti						
Lakes						
Taranaki						
101–200	49.4 (16.5)		47.6 (19.9)		31.8 (20.0)	
Hawke’s Bay						
Nelson-Marlborough						
Hutt Valley						
MidCentral						
Northland						
Bay of Plenty						
201–400	46.3 (17.9)		42.5 (18.3)		28.1 (17.5)	
Southern						
Waikato						
Capital Coast						
>400	48.1 (17.3)		44.2 (18.0)		29.7 (16.6)	
Counties Manukau						
Waitemata						
Canterbury						
Auckland						

Burnout and hours of work

There were significant correlations between the total hours of work recorded by participants and mean burnout scores for all scales except patient-related burnout ($r_s=0.098$, $p<0.001$; $r_s=0.125$, $p<0.001$; and $r_s=-0.025$, $p=0.345$ for personal, work- and patient-related respectively). The findings suggest that the greater the hours worked in a week, the higher the mean burnout score recorded. Table 8 presents the average hours worked in a week for those scored as burnt-out (scores on the CBI ≥ 50) compared with the average hours for those scoring less than 50 on the CBI.

There was a weak correlation ($r_s=-0.060$, $p=0.021$) between the hours of private work and the personal burnout scale score. The more private hours recorded, the lower the mean personal burnout score. There was no association between the FTE of the respondent and any of the mean burnout scales, although there was a weak association between the mean FTE and the proportion of those scoring as burned out in the work-related scale ($p=0.035$). Working more than 14 consecutive hours in the past week was significantly associated with higher mean personal and work-related burnout ($p=0.001$) but not patient-related burnout ($p=0.937$). On a proportionate basis, the same trend held for personal and work-related burnout ($p=0.003$ and $p=0.001$ respectively). There was no association between the burnout scores across the scales and whether or not the respondent had a period of rest of less than 10 hours in the past week. Not having had 24 hours free of work in the past week was strongly associated with higher mean personal and work-related burnout scores ($p=0.001$) but was not associated with mean patient-related burnout ($p=0.251$). These findings are detailed in Table 8.

Table 8: Burnout scores by demographic variables

Variable	Personal burnout			Work-related burnout			Patient-related burnout		
	Scores ≥50	Scores <50	p	Scores ≥50	Scores <50	p	Scores ≥50	Scores <50	p
Mean total hours worked	64.3	58.7	0.001	65.1	58.7	0.001	60.6	61.62	0.663
Mean hours of private work	4.7	5.7	0.021	5.1	5.3	0.716	5.0	5.4	0.600
Mean FTE	0.93	0.91	0.215	0.94	0.91	0.035	0.91	0.92	0.442
Have you worked more than 14 consecutive hours in past week?	Mean score	SD	p	Mean score	SD	p	Mean score	SD	p
Yes	49.9	17.2	0.001	47.2	18.6	0.001	29.2	18.0	0.937
No	45.4	17.5		41.8	18.9		19.3	17.9	
	% ≥50	% <50		% ≥50	% <50		% ≥50	% <50	
Yes	53.9	46.1	0.003	48.2	51.8	0.001	15.5	84.5	0.888
No	46.0	54.0		36.5	63.5		15.7	84.3	
Have you had a period of rest of less than 10 hours in the past week?	Mean score	SD	p	Mean score	SD	p	Mean score	SD	p
Yes	48.0	17.6	0.374	44.7	19.1	0.520	28.7	17.7	0.429
No	47.2	17.5		44.0	18.8		29.5	17.9	
	% ≥50	% <50		% ≥50	% <50		% ≥50	% <50	
Yes	51.7	48.3	0.215	42.9	57.1	0.649	14.6	85.4	0.522
No	48.4	51.6		41.7	58.3		15.9	84.1	
Have you had 24 hours free of work in the past week?	Mean score	SD	p	Mean score	SD	p	Mean score	SD	p
Yes	45.8	17.1	0.001	42.4	18.4	0.001	28.8	17.2	0.251
No	51.0	17.7		48.0	19.3		30.0	19.1	
	% ≥50	% <50		% ≥50	% <50		% ≥50	% <50	
Yes	46.8	53.2	0.001	48.1	51.9	0.001	18.6	81.4	0.020
No	55.9	44.1		39.0	61.0		18.6	86.2	

Independent factors associated with burnout

The results from the logistic regression analysis on the burnout prevalence data (those scoring as likely burnt-out with CBI scores ≥ 50) revealed multiple independent factors associated with the three different dimensions of the CBI. As detailed in Table 9, having a self-rated health status of fair or poor (grouped) resulted in the highest OR for burnout scores ≥ 50 across all three burnout categories compared to those who self-rate their health as either very good or excellent (grouped). For personal burnout, those who rated their health as fair or poor had an OR of 10.8 for risk of burnout and 8.6 for risk of work-related burnout ($p < 0.001$) when compared with those with very good or excellent self-rating health (reference group). Similarly, the OR was 2.6 for patient-related burnout. Those aged younger than 60 had a much higher likelihood of scoring ≥ 50 , particularly for personal burnout, when compared with those aged over 60 (reference group). Being female had an OR of 2.1 for personal burnout and an OR of 1.5 for work-related burnout ($p = 0.001$) compared with males. Working greater hours was a risk factor across both personal and work-related burnout, but working more than 14 hours consecutively was only a risk factor for work-related burnout (OR 1.4 compared with not working 14 consecutive hours, $p = 0.004$).

Table 9: Factors independently associated with burnout on multiple regression model

Personal burnout

Variable	OR	95% CI		p
Total hours worked	1.006	1.004	1.012	<0.001
Health status 'Good'	4.44	3.398	5.798	<0.001
Health status 'Fair' & 'Poor'	10.78	6.798	17.085	<0.001
Female	2.14	1.679	2.728	<0.001
Age group 30–39	2.86	1.778	4.594	<0.001
Age group 40–49	2.45	1.695	3.546	<0.001
Age group 50–59	1.70	1.168	2.461	0.005

Work-related burnout

Variable	OR	95% CI		p
Total hours worked	1.006	1.002	1.010	0.005
Working more than 14 consecutive hours	1.429	1.122	1.820	0.004
Health status 'Good'	2.561	1.988	3.298	<0.001
Health status 'Fair' & 'Poor'	8.640	5.688	13.124	<0.001
Female	1.501	1.184	1.903	0.001
Age group 30–39	1.959	1.218	3.152	0.006
Age group 40–49	2.188	1.499	3.193	<0.001
Age group 50–59	1.876	1.280	2.750	0.001

Patient-related burnout

Variable	OR	95% CI		p
Health status 'Good'	1.605	1.154	2.232	0.005
Health status 'Fair' & 'Poor'	2.583	1.705	3.913	<0.001

Qualitative findings: perceptions of factors relating to burnout

As detailed in the methods, respondents were asked to contextualise their answers or provide additional comments on the survey in an open-ended text box at the end of the main questions. More than half of the respondents (n=757, 51%) left comments ranging from a few lines to over a page of text, and the resultant data were rich and illustrative. Most people used the comments box to describe how they felt about the most frustrating, tiring and stress-inducing factors associated with their work. Some sought to explain their recorded hours of work over the week, and many reacted strongly to the final section of the CBI, which focused on attributing burnout as associated with interactions with patients. The emphasis on patients encouraged many to reject the implied assertion that patients were a source of their burnout, instead noting that “[it’s] more frustrating working with administration than patients”. Others reacted to the lack of questions that tapped into what they found the most frustrating and burnout-inducing elements of their work other than patients. For example, one respondent stated: “You have failed to enquire about the most frustrating part ie, mediocre, intransigent management and under-resourcing.”

The comments, as anticipated, provided valuable contextual information which helped to expound the statistical trends as well as reflecting how burnout was conceptualised by the participants. The process of repeated coding and re-coding resulted in five final overlapping umbrella themes which served as a framework to analyse the comments. These macro themes and associated sub-themes are detailed in Table 10 with illustrative comments. Unless explicitly stated, each comment is from a different individual and was chosen because of its ability to best reflect the point or element of discussion.

Table 10: Macro themes with subthemes and illustrative comments

Macro theme	Sub theme	Illustrative comments from different respondents
Interpersonal relationships	Recognition and support	“I am the nominated clinical leader for our service. Despite this, my ability to influence any aspect of the operation of our service is severely limited. It is this constant lack of control – the knowledge that things could be much better than they actually are but the inability to make the necessary changes – that is so sapping for me. Constantly delivering low value activities is demoralising. The lack of ability to engage effectively with middle and senior management to progress the implementation of quite modest changes in working practices and the lack of support from medical colleagues for a change in approach within our unit are together profoundly depressing. It does make me think quite often that I would be better off elsewhere.”
	Ability to influence and control	
	Interactions with patients	
	Interactions with management	
Resourcing	Staffing levels	“The staff shortage in our department is so chronic that a ‘normal’ weekly roster is almost unheard of and most weeks I am covering more than just my given area. We are all asked on a regular basis to do extra hours to cover other people’s leave. It has been going on for so long that it has become the new ‘normal’ and it is only when I have an occasional week where I only have to do my set job that I realise how busy and demanding the job constantly is.”
	Administrative support	
	IT issues	
	Physical environment (eg, office space)	
Workload issues	Hours of work	“There is an emphasis on counting ‘face-to-face’ contacts from our management which ignores the quality/intensity/duration of clinical encounters. This values locum style superficial churning of cases, as that approach generates good statistics. This is very discouraging for clinicians that maintain a specialist standard, as there is no recognition of the quality of clinical work – which in psychiatry can be very draining, in terms of time and emotions. There seems to be no way of maintaining standards and increasing throughput, so the pressure to do a worse job is demoralising. Of course, burnt out psychiatrists become detached and disengaged, and therefore more able to superficially churn through high frequency, low quality clinics. So locums and burnt out psychiatrists generate good statistics – and the most valued outcomes are statistics. All of this occurs within the hours of work. Rather than routinely staying late, non-clinical time goes. This isn’t therefore captured by my hours of work.”
	Intensity of work	
	On-call and shift work	
	Ability to access and impact of leave	
	Part-time versus full-time work	
Work-life balance	Impact of dependents	“For me, the hardest part of being a female in the medical workforce is resisting the notion that we should work in our own time to keep up with our paperwork. Family and childcare commitments mean that I can’t work from home in my own time and, quite frankly, I won’t allow myself to fall into that habit. This is something that some of my more ‘senior/old school’ colleagues don’t seem to agree with or understand. I put all my energy into my work day just to keep up with the onerous amount of paperwork that comes with my particular role, and even so, never seem to be quite on top of things. In my department, we have no scheduled non-patient or non-clinical time either, so we rely entirely on having a ‘quiet’ day clinically to find some time to catch up. The added stress of always being ‘one step behind’ has contributed enormously to my feelings of not being able to cope with this work, and enjoying my work less now than I used to.”
	Family time	
	Importance of exercise, mindfulness and leave	
Managerialism	Targets	“I left the UK because of frustration with the stupid health care system. I came to NZ as the system here was much better. The idiocy has followed me. I have no problems with patients or my job. I have problems with targets, poor equipment and mindless regulation. We are being pressurized to breaking point to increase throughput with no measurement of quality of kindness or thought.”
	Issues with systems and structures	
	Political pressures	

Interpersonal relationships

Comments in this theme spoke of the importance of having good collegial relationships and support from the wider hospital leadership as a factor mitigating their likelihood of burnout. While some noted this theme by referring to peer support as a positive buffer against unpleasant and stressful aspects of their work – for example, “I’m lucky to work with colleagues who are really supportive” – most emphasised the impact of negative interactions with colleagues and management. One respondent noted that “interaction with difficult people in the workplace can make or break you. I have noted a distinct lack of good robust [human resources] support in the system.”

Many people referred to the importance of feeling listened to and respected by managers and clinical leaders; for example, “Being respected, trusted to manage my own time and clinical responsibilities and being supported by our team leaders makes a huge difference in terms of team morale and in preventing compassion fatigue and burnout.” Others spoke about the impact of a “lack of positive feedback and no performance review[s]” as “reducing... enjoyment of the job”.

The theme of control was also noted as a core factor in abating or contributing to burnout: “I feel I’m in control ... I have been successful balancing work and family life and in that balance I find my strength.” Lack of control was noted as an extenuating circumstance: “Job-related stress leading to burnout is exacerbated by loss of control over how our work is structured and delivered, and working in services where we do not feel we have any useful input and influence over management decisions.” Similar sentiments were expressed by another respondent in more forceful terms: “The utter lack of any control over our work place and workload is particularly damaging. No-one really gives a damn about you.”

As noted, many spoke of the enjoyment they gained from their interactions with patients, and many used the comments box to reject the assertion that patient contact was a negative factor in their day-to-day work: “I can sometimes feel worn out or burnt out with frustrations of lack of progress with management, service development, but almost never with patients or patient care. That part of work is 99% pleasure.” Some referred to stress resulting from increased patient expectations and draining interactions with families of patients: “The parents of the patients are often very anxious and can be demanding of a doctor’s time and resources.” Nevertheless, more often people framed their interactions with patients as negative because of wider systemic limitations on the amount of available time to spend with them: “I find face to face interactions with patients in the public system difficult mostly due to a lack of time to spend with them. I am given 15 mins for all consultations including new cancer diagnoses!”

By contrast, many comments sought to contrast the enjoyable aspects of their work with patients with extremely negative comments regarding interactions with and the negative impact of poor management. “This is not about the patients – it is about the management – micromanagement, bullying, constant reviews and restructuring.” And as others stated, “Management are more rigid and difficult than patients!”, “A huge factor is micromanagement and a hostile relationship with management. Our workplace culture is toxic and this is a major source of stress”, and so on. As one respondent summed up: “Public hospital management is by far the most frustrating part of my career. They do not care.”

Resourcing

Many comments referred to the negative impact of poor resourcing on their feelings of frustration and stress and self-identified burnout. Frequent themes were lack of clerical support, suboptimal IT support, inefficient electronic systems, resource shortages in the form of senior medical officer (SMO), nursing and clerical staff, and the resource-limited nature of the physical working environment. Many spoke of the increasing burden of administrative work “that previously would have been done by secretarial staff”. In the words of one respondent:

The increasing administrative work required of me is becoming excessive for my FTE; endless emails, meetings that beget meetings, the [Medical Council of New Zealand] requiring more and more paperwork/online portal work for the SMOs who are supervising interns ... working in a department which has larger proportion of short term contract overseas trained doctors, means this workload falls time and time again to the smaller number of long termers, even if less FTE ... HoD also overwhelmed with admin stuff. Burnout a definite risk ... admin must be a big part of it ... This is not why I chose to do medicine!!!

Others mentioned the impact of poor quality working environments. For example, one person emphasised the negative influence of “poor quality buildings, small office spaces, [and] large numbers of staff cramped together” on their ability to work effectively.

One of the most widespread themes was the stress associated with increasing workloads and static staffing levels. Respondents spoke of feeling unable to achieve the work within allocated hours and frequently using either non-clinical time or personal time to keep up with work: “While I work part-time in theory, I find that I work a full-time job in part-time hours with overflow into my scheduled time off.”

Others referred to the cumulative burden of chronic short staffing, gruelling workloads and inadequate SMO numbers. As one respondent summed up:

The acuity of the patients in our service has increased without enough staff to treat these patients. Non-clinical time has disappeared in consequence. Burnout is happening on the other members of the team and the SMOs mop up. I'm not ready to retire but am seriously considering moving on.

One respondent spoke of a recent experience with burnout that has contributed to the "constant demands on [their] time at the hospital" where:

[I'm] not just seeing my usual clinic patients ... but also seeing other consultants' patients who need an urgent consult that day, dictating on every patient, signing off letters, checking results and also triaging new referrals which then are usually 20–30 on my triage day once per week ... One also needs time to think about the more patients with more challenging conditions and how best to manage them, which seems to be given no value whatsoever. All the system seems to be interested in is how many patients can be booked per clinic and these other tasks appear to be invisible and constantly more is asked of us ... It's a quietly stress invoking situation constantly feeling like you're racing against the clock to perform all these various duties in a clinic session.

Workload issues

Issues of resourcing frequently spilled over into discussions about workload issues. This theme encapsulated comments with a greater focus on issues pertaining to hours of work, the intensity of work, the impact of on-call duties and shift work, and the ability to access leave and the quality of that leave while away. Respondents spoke of feeling that they were working sub-optimally after long stretches on call and expressed fears that this could affect not just the quality of their patient care, but also the safety of their practice. For example, one respondent noted the impact of working on-call duties:

I spend at least 2/3 of every working week feeling mildly or moderately fatigued, often do not look forward to going to work, and it takes a minimum of 3–4 weeks leave before I begin to feel truly rested and rejuvenated. I am conscious that when exhausted my communication with my colleagues at work suffers, and I am certain I am not capable of making accurate, safe clinical decisions toward the end of a 24-hour shift – I have requested not to be rostered to these when possible. In short, I feel working as a senior registrar and now SMO in the NZ public

health system is making me mildly unwell and frequently exhausted, concerning so early in my career, and I am considering how best to take steps to mitigate this risk, for myself, and my patients.

Many commented on the impact of shift work and on-call duties, noting that this intensified with increasing age: “Doing shiftwork is more and more exhausting as one gets older. Recovery time especially after night can take a few days. Often on days off I find I am too tired to do anything.”

Many spoke of the burden posed by staffing shortages and how this frequently resulted in a spike in workload which in turn could precipitate burnout: “Additional hours worked to cover absent colleagues contributes to burnout significantly.” This was specifically noted with respect to the impact of sick leave and the difficulties in finding cover, particularly in busy times: “Staffing shortages due to sick leave have been horrendous and everyone is too sick or tired to pick up short notice locums.” Equally, there were a number of references to the benefits of working fewer hours, either as a strategy to circumvent the risk of burnout or as a tactic to avoid further burnout post-recovery. As one respondent noted: “I deliberately have chosen to work less hours to prevent burnout. I have elected to not do call, weekends or nights as I have a young family and would prefer to enjoy this time of my life with my family.” In a similar vein another respondent noted: “I would never want to work full time on the acute wards; it’s too emotionally and physically draining/pressured. I keep things in check by working part time which also ensures I have time with my young family.”

Work-life balance

Comments in this section included those that touched upon elements of the importance of work-life balance, whether in terms of ensuring enough time to spend with family and friends or the additional burden placed on managing stress by having young families. Comments in this theme also mentioned the importance of having strict controls on the amount of work undertaken out of working hours in order to maintain a semblance of balance and avoid burnout. For example, one respondent noted: “I have burnt out in the past ... Now I have reorganised my life. I very seldom do any extra work. I limit my involvement with management. I try only to interact with people who can actually make a difference. Life outside of work is a balance and I purposely make an effort to have a full variety of life.”

This was referred to explicitly by others in terms of the immense efforts taken to avoid burnout:

I confess that in order to control my susceptibility to burnout, I exercise every day, eat a whole grain no sugar no animal protein diet ... I am involved in regular community activities, see a non-clinical supervisor monthly and chose not to have children ... At the moment things are going well. But I put a lot of effort in.

Others made similar comments, noting the vital importance of taking time to exercise, having a DHB-subsidised gym membership, and ensuring regular periods of leave to recuperate. Some women respondents noted that they frequently felt more exhausted from having young children at home, while others noted that they only manage because they have good health and placed strict limits on out-of-work commitments.

Managerialism

The final theme in the qualitative comments related broadly to issues about how services are managed and the significance of political pressures on how individuals are working, including the imposition of targets. As with other themes, the ideas were tightly entangled around issues with hours of work, interpersonal conflicts and resourcing, but comments in this theme spoke more directly about issues concerning 'the system', actions of management broadly defined, bureaucratic obstacles, and tensions between meeting targets and maintaining appropriate standards of care. Many spoke of frustrations with increased demands from management that respondents felt had little to do with patient care. For example, one respondent noted: "The main frustration is the way the health service is run like a business where clinical expertise is no longer valid and you are judged by whether you have filled in a stats sheet regularly."

Similarly, others noted the negative impact on their enjoyment and satisfaction at work when support from management was perceived as lacking or as an impediment to core clinical work:

Generally I love my work except when there is too much of it! When we are well-staffed it is a pleasure to be here ... The biggest source of stress at work is our management and their general incapacity to address issues such as under-resourcing in an adequate way or even a timely manner. Also management in general love to impose solutions on us instead of collaborating with us to work out solutions to our issues. They also love to constantly change things for the 'better' without much consideration of/understanding of the (often negative) downstream effects of the changes.

As noted in the 'interpersonal' theme, comments about the impact of managerialism and poor management were frequently contrasted with comments about the enjoyment gained from working with patients. Similarly, however, many spoke about the difficulties of working in a managerial role and, particularly, the time required to undertake such a role effectively: "I find [it] very difficult to balance work demands (clinical and managerial). Now taking work home regularly to complete or read in preparation for future meetings etc." Similarly, another respondent noted: "[I] often feel exhausted due to managerial aspects of work, very frustrating and exhausting – patient related work makes up for it!"

Many spoke to frustrations with 'the system', particularly in terms such as under-resourcing, structural and systemic issues 'beyond immediate control', and the priorities of 'the system' as being disjunctive to clinical reality. As one respondent put it: "Patients are fine. The system is the problem."

DISCUSSION

The CBI is a sound and internally consistent tool to measure burnout in this cohort of medical professionals. The three burnout dimensions used in this study have good internal consistency and criterion-related validity. Compared with other studies using the CBI, the findings from this research suggest the levels of personal and work-related burnout in this cohort are significantly higher than the baseline in human service workers (Borritz, Rugulies et al. 2006), although the patient-related scores are similar to those found in other studies, and are in some instances lower (D'Souza, Egan et al. 2011; Chou, Li et al. 2014). The scores for personal and patient-related burnout are very similar to those found in the German study of physicians by Klein, Grosse Frie et al. (2010), which also had a similar sample size.

The results suggest that burnout is prevalent across the New Zealand senior medical workforce, with particularly high scores for individual physical and psychological exhaustion across all DHBs. The high scores for work-related burnout and the high proportion of crossover between work-related and personal burnout suggest that the impact of work and working conditions is perceived as a significant contributor to feelings of exhaustion and fatigue. The relatively low incidence of patient-related burnout suggests that the majority of respondents attributed their fatigue and feelings of exhaustion to factors other than their interactions with patients, although some specialties did find interactions with patients a source of burnout. This finding was strongly reiterated in the qualitative comments.

Increasing mean and burnout prevalence scores were strongly correlated with worsening self-rated health status, suggesting that burnout has a clear relationship with poor health, although directional causality cannot be inferred from the findings. The multiple regression analysis reinforces the link between burnout and health status. Given the high rates of presenteeism found in another recent study on the DHB-based ASMS membership (Chambers 2015), and the known correlations between ill health, burnout and presenteeism behaviour, this relationship warrants further examination.

As noted by Kristensen, Borritz et al. (2005), those who have a high personal burnout but not work- or patient-related burnout may have additional stressors in their lives such as poor health or family demands (eg, the impact of having young children). While the current study could not probe these factors further due to limitations with the demographic variables selected for inclusion, there was frequent reference to themes such as the impact of age and having young children in the qualitative data. Furthermore, given the attributional emphasis of the structure of the CBI (the degree to which people make connections between their

fatigue and either their conditions at work or their patient-work) the themes illustrated by the qualitative data are particularly important in terms of providing the detail of these various attributional schemata (Kristensen, Borritz et al. 2005). The clear emphasis on issues such as under-resourcing, workload, poor management and short staffing are noteworthy themes in this regard. As Kristensen, Borritz et al. (2005) emphasise, how individuals attribute the symptoms of their stress, fatigue and in some cases, explicitly attribute their burnout, highlights the manner in which people make sense of their feelings of stress and fatigue and explain these features in their day-to-day lives.

It is further reasonable to assume that the pressures cited as additional extenuating circumstances influencing their burnout are highly likely to be exacerbated by pressures associated with work or patient-contact even if these causal attributions are not made explicit. The scales of burnout highlighted by the CBI in this study are therefore best understood as overlapping spheres of influence and attribution. What the relatively high level of work-related burnout suggests, however, is that there are significant stressors associated with working conditions within New Zealand's DHBs that have a significant impact on levels of exhaustion and fatigue experienced by individuals. In other words, work-related stressors are clearly spilling over to affect the levels of exhaustion experienced by individuals (Winwood and Winefield 2004).

The findings from this study give an updated, nationwide perspective on the burnout study conducted by Surgenor, Spearing et al. (2009) which was based at Canterbury DHB in 2006–2007. The findings from their study, which used the MBI, found prevalence of burnout was relatively low, particularly for emotional exhaustion and depersonalisation. It is worth noting that Canterbury has subsequently experienced considerable upheaval, in part due to the earthquakes of 2010 and 2011. Mean burnout scores for Canterbury as reported in this study were 46.5 for personal burnout and 42.9 for work-related burnout, and were around the middle range of burnout scores for DHBs. Notably, however, Surgenor, Spearing et al. (2009) found that longer working hours and less medical experience were both independent factors that increased the odds of scoring as burnt-out for emotional exhaustion in the MBI. This is similar to the results of the multiple regression analysis in this study, with age possibly acting as a proxy for length of medical experience.

The current study found differences in work-related burnout scores which were statistically significant according to the host DHB of the respondent. While the reliability of these statistics is questionable, particularly in DHBs with very low numbers of respondents (eg, Whanganui), these differences appear correlated in some way to the numbers of ASMS members at each DHB. This was most evident

when the DHBs were grouped according to four categories of numbers of ASMS members (Table 7). The DHBs scoring particularly poorly for mean rates of burnout were those with members numbering between 101 and 200. These DHBs include Nelson Marlborough, Hutt Valley, and Northland, which also ranked highest in the burnout prevalence scores. ASMS members at Hutt Valley DHB, for example, had 63.3% prevalence of baseline burnout, and Nelson Marlborough had 61.5% prevalence of work-related burnout as well as correspondingly high mean burnout scores across these categories. Analysis of the qualitative comments cross-cut by DHB did not reveal any particular trends as to why this may be so, other than key points relating to workload that are consistent across the board. The differences according to DHB nonetheless do suggest that there are some peculiar factors that might be increasing work-related burnout at certain DHBs which would benefit from further investigation.

Gender and burnout

Notable in the findings is the strong correlation between burnout and gender, with women surveyed significantly more likely to score as burnt-out across personal and work-related measures of burnout than their male counterparts. Being female also significantly increased the odds of scoring ≥ 50 for personal and work-related burnout by 2.1 and 2.6 times respectively. The trend for women to have worse burnout scores held when cross-cut according to age and self-rated health status.

The literature on connections between gender and burnout is varied. Some studies find that male physicians are more likely to experience burnout than women (Jacobs, Nawaz et al. 2012), whereas others have found the opposite (eg, Kuerer, Eberlein et al. 2007; Klein, Grosse Frie et al. 2010; D'Souza, Egan et al. 2011). Recent research into levels of burnout in Australian medical graduates, which also used the CBI, found females had significantly higher personal burnout scores than their male counterparts (Parr, Pinto et al. 2016), although possible contributing factors were not explored. Research cited in Klein, Grosse Frie et al. (2010), however, notes work–family conflict was found to be a strong correlate with negative mental well-being for female physicians, whereas this was the least significant factor for men. Cheng, Chen et al. (2013) also found women aged between 30 and 35 had the highest prevalence of burnout (tool: CBI) and found that women aged between 30 and 40 had the highest prevalence of psychological job demands as measured by Karasek's Job Strain Model. These variations in gender burnout scores appear to be at least partly related to which tool is used to measure burnout. In Jacobs, Nawaz et al. (2012), for example, the burnout scores varied according to gender depending on whether they were reporting the CBI scores or the MBI findings. In their research, females had higher scores for personal

and client-related burnout than their male counterparts, whereas men had worse burnout scores according to the MBI.

Both prevalence and mean personal burnout scores peak for women aged between 30 and 39. As considered in the next section, this may reflect particular life-stage issues such as the challenges around establishing oneself as an early-career specialist and possibly being involved with the demands of young children. For example, one woman in the sub-group of 30–39-year-olds who left comments noted: “I have a small toddler at home and am currently pregnant. Not sure what is more exhausting – work or home!” Future research would benefit from having additional questions about the number of dependents and their care arrangements as a variable against which to analyse the findings, and to investigate this trend further. The possible connections between life stage, gender and burnout, however, must also be considered in light of the culture of medicine. In previous research on the ASMS membership, women in the same age group also scored very highly for rates of working through illness. Comments in this previous study referenced stress and tensions manifesting between the expected norms of professional behaviour and commitments to family life and self. As some authors have noted (eg, Tsouroufli, Ozbilgin et al. 2001; Ozbilgin, Tsouroufli et al. 2011) assumptions about what constitutes ‘ideal’ medical practice is interwoven with subtly gendered expectations such as being available for ‘all hours work’. This notion was referenced explicitly by one respondent who stated:

For me, the hardest part of being a female in the medical workforce is resisting the notion that we should work in our own time to keep up with our paperwork. Family and childcare commitments mean that I can’t work from home in my own time and, quite frankly, I won’t allow myself to fall into that habit. This is something that some of my more ‘senior/old school’ colleagues don’t seem to agree with or understand.

As with the issue of presenteeism, it is conceivable that these pressures to work in personal time as well as other expectations around how best to demonstrate commitment to the profession are factors contributing to the propensity for burnout amongst women in this age group. Perhaps most significantly, this trend suggests there are key issues faced by female doctors and dentists in the senior medical workforce that need addressing.

Age and burnout

The higher mean rates and prevalence of burnout for both men and women aged between 30 and 39 is a notable trend consistent with findings from other studies. Kamal, Bull et al. (2016), for example, found that burnout was more likely reported

by younger doctors involved in their study, particularly for those aged 50 or younger. Norlund, Reuterwall et al. (2010) also reported a spike in burnout scores for those aged between 35 and 44, with women in this age bracket also having the highest prevalence of burnout as measured by the Shirom–Melamed Burnout Questionnaire. Both papers conclude that the higher propensity for burnout may reflect the pressures around establishing professional careers but also greater tensions between home and work life that appear to manifest at this life stage. Kamal, Bull et al. (2016) did not find a consistent correlation between burnout and levels of experience in their study, but other research by Dyrbye, Varkey et al. (2013) found that early career physicians involved in their study on physician satisfaction and burnout had the highest frequency of work–home conflicts. Those in the mid-career category (defined as those who had worked for between 11 and 20 years) were found to have the highest rates of burnout in their study cohort. For the medical specialists in the current study, the younger specialists are likely to be early in their specialist career and may be finding things stressful as a consequence, although this was not examined directly. This notion was, however, referred to in a comment by a respondent:

I am a first year consultant and conscious of the risk of fatigue and reduced vigilance in my work, and of burnout. I have felt a lesser enjoyment of work, exhaustion several days of most weeks worked, and a change in personality since completion of final specialty exams ... I am irritable and impatient when fatigued at work compared to as a junior trainee. I believe this partially reflects working in the public NZ system, where repeatedly and progressively, staff working clinically are asked to do more, faster, for patients with increasing comorbidity, with lesser resources. Spending effective time with patients and seeing juniors taking the time to manage the basics well is almost becoming a forgotten luxury.

While the study has no means of interrogating these themes objectively, it is well known that transitioning from working as a resident medical officer to being a hospital consultant (specialist) is a particularly challenging and difficult period. Robinson, Morreau et al. (2007), for example, emphasise the burdens of self-expectation, increased responsibilities and difficulties maintaining work–life balance for new consultants, particularly “given the background of the culture of medicine which assumes strength, independence, misguided omnipotence and workaholism” (Robinson, Morreau et al. 2007 p1). As noted in the analysis of the qualitative data, there were many references to the challenges associated with achieving work–life balance and the barriers that may prevent this. It is entirely feasible that for senior doctors and dentists within the 30–39-year age bracket,

there may be issues associated with their life stage that are creating greater challenges for them than at other age or stages, and as a consequence it is feasible to suggest that age in the current study may be a proxy for career stage or life stage.

Being aged between 30 and 39, however, was not the strongest predictor of burnout in the regression analysis, although this may be due to the lower numbers in this cohort (n=164 compared with over 500 in the other two age categories, refer Table 2). The findings from the multiple regression analysis suggest a clear drop-off in burnout propensity for those aged over 60. There are several possible explanations. First, there is likely to be a selection effect, with those worst affected having taken early retirement or, possibly, experienced severe illness or premature death. Dyrbye, Varkey et al. (2013) note that correlations between low burnout and older doctors may be as a consequence of “self-selection among older physicians and exit from practice of those who are least satisfied” (p1365). A second, related issue is that those who remain in employment will have either been selected on the basis of their resilience or have developed coping mechanisms over the course of their career. It may be the case, therefore, that those physicians aged over 60 who participated in the current study may be a resultant pool of specialists who are better able to tolerate challenging conditions at work and resist fatigue and exhaustion. Analysis of the FTE and hours of work data for those aged over 60 did not suggest that this cohort had lower average FTE or weekly hours of work than the overall average, even though many physicians are seeking to reduce their hours of work when they reach this age group. One respondent referred to the importance of experience as ‘buffering’ them from the risk of burnout:

I am close to retirement and have lots of experience to buffer the clinical stresses and management frustrations. For me this survey 15 or 20 years ago would have elicited very different responses when my stresses and frustrations were much higher, resources actually less than now (but ‘management’ interference at local, regional and national level actually less pervasive/counter-productive than now and societal expectation and behaviour different).

The idea that burnt-out specialists may have already retired or reduced their participation in onerous duties (eg, on-call) deserves further consideration, as there was notable mention of intent to retire and burnout in the qualitative comments.

Burnout and medical specialty

This study's findings confirm trends in existing literature for certain medical specialties to experience higher rates of work-related and personal burnout than others. Notable in this regard were the particularly high scores recorded for those working in emergency medicine, psychiatry and dentistry. Mean personal burnout scores, however, were highest for those working in pathology (50.5), with diagnostic and interventional radiologists also scoring highly in the same category of burnout (49.8). Analysis of the qualitative comments left by those working in these specialties suggested that issues associated with resourcing, especially staffing shortages and increasing volumes of work, are core contributing issues. One pathologist noted that, although there is no patient contact in their specialty, "there is a high stress level related to diagnostic accuracy and chronic short staffing". Another respondent from diagnostic and vocational radiology noted the high numbers of "imaging procedures done each year ... yet our FTEs for the department do not increase and we are told we are fully staffed meaning we have to work harder or longer to be able to get the work done in an acceptable time frame". Another participant, who was a head of department, stated "[It is a] very poor situation for cooperative leadership and poor support from management. [We are] under-resourced professionally and in administrative and managerial terms." These connections made between short staffing, under-resourcing and pressures for accuracy with stress and burnout echo the concerns made by other medical specialists, but suggest there may be specific pressures for these services that require further attention.

As demonstrated in Figure 5, those working in emergency medicine had the highest mean rates of personal and work-related burnout – a pattern consistent with findings in other research (Estryn-Behar, Doppia et al. 2011). Lu, Dresden et al. (2015), for example, note that according to their study using the MBI, emergency physicians had the highest rates of burnout across all specialties, with this burnout strongly associated with higher rates of self-reported sub-optimal care for patients. Other research suggests there are distinct stressors associated with working in emergency departments (Johnston, Abraham et al. 2016), and that high anxiety levels for patient outcomes (Kuhn, Goldberg et al. 2009) combined with ineffective coping styles (Howlett, Doody et al. 2015) are significant predictors of burnout, as measured by the MBI.

Analysis of the comments left by those emergency medicine specialists found many references to the tiring and burdensome realities of shift work and on-call duties, as well as an emphasis on the intense workloads of the emergency department. As one respondent noted: "I love emergency medicine [but] feel frequently oppressed and worn-out by the conditions in which we practise it, with volume overload, staff

shortages, access block [and] lack of resources.” This echoes the findings of research by Johnston, Abraham et al. (2016) which noted the impact of critical staff shortages, increasing patient numbers and patient acuity. Emergency medicine specialists in New Zealand are also required to work shifts, with the resulting fatigue and exhaustion having clear implications for patient safety (Smith-Coggins, Broderick et al. 2014).

Rates of burnout for psychiatrists were also notable and second only to emergency medicine specialists when work-related and personal burnout scores were graphed against each other (Figure 5). Mean patient-related burnout scores were the highest for psychiatrists (35.9). Analysis of the qualitative comments left by psychiatrists in this study did not support the notion that patients were specifically a source of burnout and stress, but did highlight the growing incidence of mental illness and the concurrent pressure to treat greater numbers of patients without an increase in resources. For example, one respondent noted that “psychiatry is under-resourced with increasing pressure to treat acutely mentally unwell people in a community setting. The pressure on psychiatrists is immense.” There was also reference in the qualitative comments to issues associated with working within the strict confines of the New Zealand Mental Health Act and the poor quality of management of mental health services across the board. As the comment highlighted in Table 10 emphasises, when assessed according to throughput measurements, psychiatrists already suffering from burnout are likely to score well against Ministry of Health targets, because “burnt out psychiatrists become detached and disengaged, and therefore more able to superficially churn through high frequency, low quality clinics. So locums and burnt out psychiatrists generate good statistics – and the most valued outcomes are statistics.” Similar sentiments were expressed in other comments which noted the increasing emphasis on running health service provision as a business with undue emphasis on statistics and less on ‘clinical expertise’.

Dentistry, despite the relatively low numbers surveyed (n=31), had moderately high patient-related burnout scores (mean 32.8), which were very similar to those recorded in Australian dentists in the CBI study by Winwood and Winefield (2004) (n=312, patient-related burnout mean score 33.3). Analysis of the qualitative comments left by the participating dentists found a very strong emphasis on issues associated with increasing patient-load and static staffing levels. Of the 11 comments left by dentists, 9 referred to workload issues and spoke of the resultant anxiety and frustration. This sentiment is summarised well in the following comment:

Despite repeatedly telling management our patient numbers are steadily increasing and we do not have enough resources and FTE to

keep within government targets, we are offered NO support or functional solutions from the DHB. It is increasingly frustrating to work for a system that increases demands and expectations on services without offering any additional support or resources or even acknowledgement of our goodwill of working above capacity which has become the norm.

The significant correlations between burnout and specific medical specialisations are concerning and suggest that for specific services, key pressures are negatively affecting the morale of the specialist workforce. Given the strong connections noted in the literature between burnout, patient outcomes and turnover intentions, these trends warrant further research and immediate attention by DHB management to consider strategies to ameliorate the negative conditions noted with respect to workload, patient acuity and resourcing.

Burnout and hours of work

Burnout scores increased concurrently with increasing hours worked per week, which is a trend consistent with findings in other studies also using the CBI (eg, Chou, Li et al. 2014) and the MBI (Surgenor, Spearing et al. 2009). Hours of work was also a factor independently associated with the likelihood of personal and work-related burnout. The 61.5 average hours of work across the week found in this study were consistent with the average weekly hours cited in other research (50–70 hours per week cited in Chen, Yang et al. 2013 p1478). The emphasis in the qualitative comments on issues associated with working shifts and on-call duties suggest that these factors may have a particularly negative association with the burnout scores, although, again, this study was unable to formally investigate this claim.

In the current study, slightly less than half the respondents (46%) had a period of rest of less than 10 hours between work, and the same amount had worked for more than 14 consecutive hours. Working more than 14 consecutive hours was strongly associated with personal and work-related burnout measures, both in terms of the mean scores and the prevalence of burnout. This was also a factor independently associated with work-related burnout in the regression analysis. This may reflect the impact such working hours may have on available time for sleep, although this study did not examine this issue directly. It is likely, however, that longer working hours will restrict available time for sleep and may also affect the quality of sleep, particularly if sleep is broken by phone calls when on-call or by the need to physically attend a call out. Ekstedt, Soderstrom et al. (2006) found in their research on the relationship between disturbed sleep, fatigue and burnout that getting less than 7 hours of sleep a night is strongly associated with burnout. They

further note that fragmented sleep is likely to have an impact on fatigue levels, which in turn are associated with burnout. The relationship between burnout, hours of work and disturbed sleep, particularly in the context of shift work and night call duties in this workforce, warrants further research.

Average private hours worked by respondents were very low in this study (average 5 hours a week). The slight correlation between increasing hours of private work and decreasing mean personal burnout was interesting. Research by Heponiemi, Kouvonen et al. (2013) concluded that physicians working in the public sector in Finland are exposed to far more strenuous working conditions compared to those working primarily in the private sector. They concluded that private sector physicians experienced better work–family balance and a more enjoyable overall work environment. Their research also found a greater propensity for presenteeism among public sector doctors than those working in the private sector (presenteeism is a known correlate with burnout; Thun, Fridner et al. 2014). Some of these sentiments were expressed in the qualitative comments from respondents who noted the better resourcing experienced in private clinics, compared with their conditions at the DHBs: “In private I space my consults out to allow more time and I generally enjoy these clinics.” Another respondent noted: “My public work is more draining than my private work as I am able to access resources for my patients more easily and do not need to rely on inefficient systems to progress patient care.” The low average hours of private work and the positive association between increasing private work and decreasing burnout scores combined with the qualitative comments suggest that workload and resourcing issues within New Zealand’s DHBs are likely to be contributing factors to burnout more so than hours of private work.

Strengths and limitations of this study

A key strength of this study is its multi-centre, cross-specialty focus. Unlike many studies which either focus on levels of burnout in a single centre or within a single specialty across different places of work, this study provides insight into the levels of burnout experienced at a single point of time by senior doctors and dentists of many specialties working across all DHBs in New Zealand. The use of a validated instrument with a high internal consistency, having a reasonable response rate, and attaining a representative spread of responses across gender and DHBs further add to the power of this study. An additional strength is the consideration of the results alongside the qualitative analysis of the comments left by respondents. While many of the ideas raised in the comments cannot be objectively substantiated, the themes in the comments proved an incisive source of contextual information and

revealed a great deal about individuals' perceptions of the main attributional schemas contributing to their feelings of stress, anxiety and exhaustion.

There are, nonetheless, some limitations to this research which require consideration. The reliance on self-reporting, particularly for the hours of work questions, may have resulted in some under- or over-reporting of the data. While the original survey requested a disaggregation of hours on call but not called in, there were frequent inconsistencies between these data, the hours of call actually worked, and the total hours of work. As a consequence, only the total hours of work were included for analysis. Future surveys would benefit from having a better mode of breaking down the components of the week's hours worked and ensuring precision in these data. Further, it must also be asked whether the mode of delivery – in this instance, an online survey – may have shaped the responses and the patterns of who responded. While the 40% response rate is reasonable, response bias may be present. It is possible that those who have experienced burnout in the past may have been more interested in participating than those who haven't, but it is equally possible that those with current high levels of burnout may have felt too exhausted to participate in the study (Borritz, Rugulies et al. 2006; Roberts, Shanafelt et al. 2014).

A related limitation of the study was the low number of responses in certain categories. For example, there were only 3 respondents in the 20–29-year age group, although this reflects the Medical Council of New Zealand (2016) workforce survey, which recorded 28 medical officers but no specialists in this age group. Further, although overall DHB response rates were found to be 'representative', some of the smaller DHBs had very low numbers. Excluding these numbers and grouping low numbering categories (eg, in self-rated health responses and grouping DHBs on the basis of numbers) may have strengthened the statistical power of the results, but some significant differences between variables may have, as a result, been overlooked or eliminated.

A final limitation relates to the difficulties in establishing causality and directionality between the burnout scores and significant correlating factors. As a cross-sectional design, the associations between various factors do not establish causality, but they certainly warrant further examination. Where relevant, this has been noted in the analysis. It is important to consider that unmeasured factors may be at play that could serve to mask or confound the results. Further analysis and more detailed questions are required to investigate these trends further, which was not possible in the current study.

CONCLUSIONS

This study is the first in New Zealand to assess the reliability and criterion-related validity of the CBI in a cross-specialty, nationwide survey of senior doctors and dentists. The high internal consistency and criterion-related validity suggest the CBI is a sound tool for assessing burnout and the degree to which burnout is attributed to either work- or patient-related factors in this context. The high mean scores and high prevalence rates of burnout suggest that senior doctors and dentists working across New Zealand's DHBs are under concerning levels of stress and exhaustion. The burnout scores in this study are higher than mean scores in comparative studies and higher than other studies examining the CBI in senior doctors internationally, suggesting there are distinct factors pertaining to the working lives of DHB-based senior doctors and dentists that are unduly predisposing them to burnout.

The relatively high proportion of work-related burnout suggests that most senior doctors and dentists feel their conditions of work are unduly contributing to their propensity to experience burnout. This was also strongly suggested by the themes revealed by the qualitative analysis of the comments data. By contrast, most respondents reported enjoyment and satisfaction working with patients, which was reflected in the low patient-related burnout scores.

The strong correlations between health status and burnout, and the high OR for burnout and all health scores other than 'very good' or 'excellent', warrant further research. As noted, it is not possible to establish causality, but given the known association between burnout and presenteeism and the high rates of working through sickness within the ASMS membership, this relationship is concerning. The very high rates of burnout in women, particularly those aged between 30 and 39, also need further attention. The medical workforce, while currently male dominated, is likely to dramatically change in composition with increasing numbers of women now graduating from medical schools around New Zealand (Medical Council of New Zealand 2016). With females and younger respondents more likely to score as burnt-out compared with their male counterparts and those aged 60 or over, serious attention must be given to improving conditions for this vital component of the medical workforce.

It is well recognised in the literature that burnout affects the quality of patient care as well as impinging upon the risk of increased medical error (Landrigan, Jeffrey et al. 2004; Fahrenkopf, Sectish et al. 2008; Balch and Shanafelt 2011; Chen, Yang et al. 2013). As a consequence, it is entirely feasible that the high levels of burnout suggested by this survey may be negatively affecting the quality of patient care.

The comments suggest, however, that for the vast majority of respondents, high-quality patient care is their *raison d'être* and appears to act as a key buffer against burnout; this relationship and possible consequences require further study.

The findings from this survey provide an insight into the psychosocial health of senior doctors and dentists working in New Zealand's public health sector. The high proportion of this critical workforce currently feeling 'tired, worn-out and uncertain' has serious implications for senior doctors and patients alike, as it is well recognised that burnout can impact on the quality and safety of patient care, as well as doctors' health, job satisfaction and staff turnover rates.

The findings from this research have obvious implications for policy. The clear emphasis on staffing levels, hours of work and poor resourcing suggests major changes to better resource DHBs and improve management culture are required. Second, although many other employers recognise the importance of family-friendly policies, it appears from the high rates of burnout amongst female doctors and dentists in this study that the health sector has a long way to go.

Further research is needed to consider the extent to which these high levels of burnout are affecting patient care and whether burnout is influencing other workforce trends, including retirement intentions. In the meantime, these findings act as a clear call to the Government, health policymakers and DHB chief executives to urgently address burnout and assist those who are already afflicted.

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APPENDIX 1

Summary of burnout scores according to variable and compared with PUMA scores

	Always ^a or To a very high degree ^b (Scoring 100) (%)	Often ^a or To a high degree ^b (Scoring 75) (%)	Sometimes ^a or Somewhat ^b (Scoring 50) (%)	Seldom ^a or To a low degree ^b (Scoring 25) (%)	Never/almost never ^a or To a very low degree ^b (Scoring 0) (%)	Score Mean (SD)	PUMA Score Mean (SD)	t	p
Personal burnout									
How often do you feel tired? ^a	8.1	52.2	34.0	5.3	0.3	65.6 (18.1)	52.5 (20.2)	19.6	<0.001
How often are you physically exhausted? ^a	1.6	22.8	46.2	25.9	3.5	48.2 (20.7)	41.5 (20.7)	9.4	<0.001
How often are you emotionally exhausted? ^a	3.1	29.7	42.6	21.3	3.3	52.0 (21.8)	37.7 (21.6)	18.9	<0.001
How often do you think: "I can't take it anymore"? ^a	1.0	10.9	31.7	32.8	23.5	33.3 (24.6)	23.5 (22.2)	11.8	<0.001
How often do you feel worn out? ^a	2.7	29.0	40.5	23.3	4.5	50.5 (22.5)	37.3 (22.2)	16.8	<0.001
How often do you feel weak and susceptible to illness?	0.9	10.5	35.1	40.2	13.4	36.3 (22.0)	22.8 (20.8)	18.1	<0.001
Total average personal burnout score						47.7 (17.5)	35.9 (16.5)	19.7	<0.001
Work-related burnout									
Is your work emotionally exhausting? ^b	11.4	33.8	41.2	11.2	2.3	60.2 (22.8)	43.9 (24.1)	20.0	<0.001
Do you feel burnt out because of your work? ^b	5.6	17.3	40.1	23.8	13.3	44.5 (26.4)	31.9 (25.8)	13.8	<0.001
Does your work frustrate you? ^b	7.0	19.1	41.7	25.5	6.7	48.5 (24.9)	38.6 (24.8)	11.5	<0.001
Do you feel worn out at the end of the working day? ^a	5.4	30.4	40.7	18.3	5.2	53.1 (23.6)	47.8 (25.2)	6.3	<0.001
Are you exhausted in the morning at the thought of another day at work? ^a	3.2	9.4	31.2	31.8	24.4	33.8 (26.3)	25.6 (23.6)	9.3	<0.001
Do you feel that every working hour is tiring for you? ^a	0.8	6.0	20.3	35.4	37.6	24.2 (23.5)	17.1 (19.6)	9.2	<0.001
Do you have enough energy for family and friends during leisure time? ^a (inverse scoring)	4.5	30.9	41.8	18.1	4.7	53.3 (23.0)	28.0 (21.8)	24.1	<0.001
Total average work-related burnout score						44.0 (19.0)	33.0 (17.7)	17.8	<0.001

Client (patient) related burnout	Always^a or To a very high degree^b (Scoring 100) (%)	Often^a or To a high degree^b (Scoring 75) (%)	Sometimes^a or Somewhat^b (Scoring 50) (%)	Seldom^a or To a low degree^b (Scoring 25) (%)	Never/almost never^a or To a very low degree^b (Scoring 0) (%)	Score Mean (SD)	PUMA Score Mean (SD)	t	p
Do you find it hard to work with patients? ^b	0.2	2.2	16.1	43.7	37.8	20.8 (19.6)	34.9 (23.5)	17.9	<0.001
Do you find it frustrating to work with patients? ^b	0.4	2.2	15.8	44.3	37.3	21.0 (19.9)	24.3 (21.1)	4.2	<0.001
Does it drain your energy to work with patients? ^b	1.5	9.2	31.5	33.7	24.0	32.6 (24.6)	36.7 (24.1)	4.6	<0.001
Do you feel that you give more than you get back when you work with patients? ^b	5.2	16.5	28.1	31.4	18.9	39.4 (27.9)	39.8 (26.5)	0.4	0.688
Are you tired of working with patients? ^a	0.4	5.9	24.8	48.9	20.0	29.5 (20.7)	23.4 (20.7)	8.0	<0.001
Do you sometimes wonder how long you will be able to continue working with patients? ^a	1.8	11.2	30.0	32.6	24.4	33.4 (25.5)	26.9 (23.3)	7.4	<0.001
Total average client (patient) related burnout score						29.5 (17.9)	30.9 (17.6)	2.1	0.034