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Burnout prevalence in the New Zealand public hospital senior medical workforce: a cross-sectional study

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ABSTRACT

Objectives: To explore the prevalence of, and associated factors contributing to, burnout among senior doctors and dentists working in the New Zealand public health system.

Design: Cross-sectional study.

Setting: New Zealand's 20 district health boards (DHBs).

Participants: A total of 1487 out of 3740 senior doctors and dentists who are members of the Association of Salaried Medical Specialists working in DHBs were recruited (response rate 40%).

Primary and secondary outcome measures: Gender, age, self-rated health status, vocation and hours of work per week were obtained from an electronic questionnaire. Burnout was measured using the Copenhagen Burnout Inventory. Qualitative data taken from an open-ended comments section was coded using grounded theory and used for contextual data.

Results: The overall prevalence of high personal burnout was 50%. Women aged <40 years had 71% prevalence of high personal burnout. Prevalence of high work-related burnout and patient-related burnout was 42% and 16% respectively. Those working in emergency medicine and psychiatry had significantly higher mean work-related burnout than other specialties ($p < 0.001$). On multi-variate analysis, having fair or poor health status (OR 10.8, 95%CI 6.8-17.1), working more than 14 consecutive hours (OR 1.43, 95%CI 1.12-1.82), and being a woman (OR 2.14, 95%CI 1.68-2.73) were independently associated with high personal and work-related burnout. Personal burnout rates decreased with age (age 30-39 OR 2.86, 95%CI 1.78- 4.59, age 40-49 OR 2.45, 95%CI 1.70-3.55, age 50-59 OR 1.70, 95%CI 1.17-2.46, compared with age >60). Qualitative data emphasised intense and unrelenting workloads, under-staffing, onerous on-call duties and frustrations with management as factors contributing to burnout.

Conclusions: High burnout appears prevalent in New Zealand senior doctors and dentists. Many attribute their feelings of burnout to work conditions. These findings may assist with understanding contributors to burnout and with developing strategies to ameliorate the high burnout found across this cohort.

Strengths and limitations of this study:

This is the first study to report levels of burnout through the CBI in a multi-specialty nationwide survey of senior doctors and dentists in any country and offers an approach that could be emulated elsewhere. Consideration of the qualitative data alongside the statistical results provides insight into recurring factors perceived as contributing to feelings of burnout. The limitations of this study include a moderate participation rate, self-reported data and the cross-sectional design with its limitation of causal inference.

INTRODUCTION

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. Existing research suggests that doctors are very susceptible to burnout and have higher rates of burnout when compared with the general public.[1] Connections have been made between doctor’s propensity for burnout and long hours of work,[2] presenteeism,[3] shift work and on-call duties.[4-6]

Burnout is of concern for doctors not only because of the risk it poses to the health of those afflicted [7,8] and the loss of highly skilled professionals from the workforce [9,10] but also because of known correlations between burnout and reduced quality of care [9-11] and the risk of medical errors.[12,13] Understanding and addressing high levels of burnout in doctors is likely to provide opportunities for improving the well-being of this critical workforce as well as enhancing the quality of patient care.

To our knowledge, no studies to date have screened for burnout specifically in senior doctors and dentists using the CBI in a multi-specialty, multi-centre nationwide survey. This study addresses this gap and aims to assess the prevalence of burnout in senior doctors and dentists of different medical specialties working in New Zealand’s public health system. A secondary aim of this research was to better understand which factors were perceived as contributing to burnout in this workforce. By combining qualitative and quantitative findings, this research captures not only the levels and correlates of the mental health and well-being of senior doctors and dentists working in New Zealand’s public health system but also some of the mechanisms through which they are affected. In this way it offers pointers to actions that could potentially improve the psychosocial health of this critical medical workforce.

METHODS

Participants and study design

The study involved members of the Association of Salaried Medical Specialists (ASMS) who are medical and dental specialists, and other non-specialist registered medical officers, employed by District Health Boards (DHB). DHBs provide health care for geographically defined populations within the New Zealand health system and are the main employers of health professionals working in the public sector. The ASMS is the professional association and union for senior doctors and dentists in New Zealand. For ease of description, these ASMS members are referred to throughout this report as senior doctors or as the senior medical workforce. At the time of the survey the ASMS represented over 90% of all senior doctors and dentists and other non-vocationally registered medical specialists employed within the New Zealand public health system. The entire population of DHB-based members of ASMS (3740 individuals) were asked by email to take part in an anonymous electronic survey in November 2015. 1487 participants finished the survey giving a response rate of 40%

Burnout

The survey used the the Copenhagen Burnout Inventory (CBI) developed by Danish researchers Borritz and Kristensen. In contrast to the more commonly used Maslach Burnout Inventory (MBI), the CBI attempts to simplify the concept of burnout to a state of emotional and physical exhaustion. This primary state of ‘personal’ burnout can then be ascribed to either work-related factors or specifically to work with clients, or in this research context, patients.[14] The CBI questionnaire contains 19 items, each scored on a five-item Likert-scale, with items collapsed into three sub-scales, relating to personal, work-related, and patient-related burnout. Only those with direct face to face contact with patients were invited to participate in the patient-related burnout section. Those who

score equal to or above 50 on average in each of the three sub-scales are classed as experiencing a high level of burnout. Prevalence scores are calculated by assessing the percentage of these individuals who score as 'burnt-out' (scores ≥ 50) as a percentage of the overall respondents within each sub-scale. Mean burnout scores for each sub-scale are calculated by averaging the scores for each line of questioning and calculating an overall average of the score.[14]

Independent variables

Additional questions were based on the Australian Medical Association's Risk Assessment checklist for 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.[15] Respondents were asked to estimate total hours of work for the week prior to completing the survey. Hours of work was defined as 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 (WHO) self-health assessment tool and demographic data including gender, age, length of time worked in New Zealand, Full Time Equivalent (FTE) (a formalised measure of weekly hours of work), primary DHB and medical specialty. Medical specialties were allocated to 11 broad categories to aid statistical analysis.

Statistical analysis

Data from the three CBI sub-scales were analysed for internal and criterion-related validity using Cronbach's alpha 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 variables specified above were tested using Spearman's rho, Chi-square and one-way ANOVA as appropriate with 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 and 95% confidence intervals.

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 following grounded theory.[16] 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 and selected specialties 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 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

The demographic composition, work and specialty details of the research participants is summarised in Table 1. 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 40-49 (39.1%) and had worked in New Zealand for between 15-30 years (44.2%). The mean hours of work for the respondents of the week immediately prior to completing the survey was 61.5 hours per week. The hours of private work were low (mean 5.3 hours per week) and on average most worked full time (mean FTE 0.9).

Table 1 Demographic characteristics of respondents (n=1487)

Gender	n	%	Total ASMS members
Male	857	59.8	2433
Female	575	40.2	1407
Age group			
20-29	3	0.2	
30-39	164	11.4	
40-49	563	39.1	
50-59	500	34.7	
>60	211	14.6	
Years worked in New Zealand			
Less than 5 years	144	10.0	
5-14 years	493	34.2	
15-30 years	637	44.2	
>30 years	167	11.6	
Self-rated Health Status			
Excellent	308	21.0	
Very Good	595	40.6	
Good	401	27.4	
Fair	142	9.7	
Poor	18	1.2	
Medical Specialty			
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	
Hours of work in week prior to survey			
Total Hours Worked	Mean	Range	
Private Hours Worked	61.5	0-168	
	5.3	0-100	
Full Time Equivalent (FTE)	0.9	0.2-1.7	
24-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	

Rates of burnout:

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. The mean burnout scores were strongly correlated ($p<0.001$) with correlation coefficients r_s 0.820 for personal and work burnout, r_s

0.451 for patient and personal burnout and r_s 0.556 for work and patient-related burnout. Table 2 displays differences in mean burnout scores according to the variables recorded.

Proportionately, 50.1% of the respondents identified as having high personal burnout, 42.1% with high work-related burnout and 15.7% with high burnout attributed to interactions with patients. Female respondents were significantly more burnt-out than their male counterparts for personal and work-related burnout. 59.4% of women scored as having high personal burnout and 46.9% with high work-related burnout compared with 43.9% and 39% of males respectively ($p<0.001$ and $p=0.003$). Female respondents in the 30-39 year age bracket ($n=88$) had very high prevalence of personal burnout (70.5%).

Those with a longer length of time working in the New Zealand public health system had significantly lower mean burnout scores for personal and work-related burnout. Those aged between 30-39 years ($n=164$) had the highest mean personal burnout scores with burnout scores decreasing with age. (Figure 1). Mean burnout scores across all three sub-scales were significantly associated with worsening self-rated health status.

There were significant associations between specialty and mean work- and patient-related burnout. Those working in emergency medicine and psychiatry had the highest mean work-related burnout scores and those working in psychiatry and dentistry had the highest mean patient-related burnout scores. Figure 2 displays mean work-related burnout by personal burnout by specialty.

There were significant correlations between the total hours of work recorded by participants and mean personal and work-related burnout scores ($r_s=0.098$, $p<0.001$, $r=0.125$, $p<0.001$ respectively). There was a weak negative correlation ($r_s=-0.060$, $p=0.021$) between the hours of private work and the personal burnout sub-scale score. There was no association between the FTE of the respondent and any of the mean burnout sub-scales although there was a weak association between the mean FTE and the proportion of those scoring as burnt-out in the work-related subscale ($p=0.035$). Working more than 14 hours in the past week was significantly associated with higher mean personal and work-related burnout ($p<0.001$). On a proportionate basis, the same trend held for personal and work-related burnout ($p=0.003$ and $p<0.001$ respectively). Not having had 24 hours free of work in the past week was strongly associated with higher mean personal and work-related burnout scores ($p<0.001$). There was no association between the burnout scores across the sub-scales and whether or not the respondent had a period of rest of less than 10 hours in the past week.

Table 2 Mean burnout scores across three sub-scales and demographic variables

Variable:	Personal burnout			Work-related burnout			Patient-related burnout		
Gender	Mean	SD	p<0.001	Mean	SD	p<0.001	Mean	SD	p=0.395
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 & 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 Prevalence of personal burnout (%) by gender and age group

Figure 2 Mean work-related and personal burnout scores by medical specialty

Independent factors associated with burnout

As detailed in Table 3, a logistic regression demonstrated that those whose self-rated health status was fair or poor (grouped) had the highest odds ratio for burnout across all three burnout categories compared to those who self-rate their health as either very good or excellent (grouped). Those aged younger than 60 had a much higher risk of burnout, than those aged over 60 (reference group). Being female had an odds ratio of 2.1 for personal burnout and 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 (odds ratio 1.4 compared with not working 14 consecutive hours, p=0.004).

Table 3 Factors independently associated with burnout on multiple regression model

Personal Burnout				Work-Related Burnout				Patient-Related Burnout			
Variable	OR	95% C.I.	p	Variable:	OR	95% C.I.	p	Variable:	OR	95% C.I.	p
Total Hours Worked	1.006	1.004 1.012	<0.001	Total Hours Worked	1.006	1.002 1.010	0.005	Health Status 'Good'	1.605	1.154 2.232	0.005
Health Status 'Good'	4.44	3.398 5.798	<0.001	Working more than 14 consecutive hours	1.429	1.122 1.820	0.004	Health Status 'Fair & Poor'	2.583	1.705 3.913	<0.001
Health Status 'Fair & Poor'	10.78	6.798 17.085	<0.001	Health Status 'Good'	2.561	1.988 3.298	<0.001				
Female	2.14	1.679 2.728	<0.001	Health Status 'Fair & Poor' Female	8.640	5.688 13.124	<0.001				
Age Group 30-39	2.86	1.778 4.594	<0.001		1.501	1.184 1.903	0.001				
Age Group 40-49	2.45	1.695 3.546	<0.001	Age Group 30-39	1.959	1.218 3.152	0.006				
Age Group 50-59	1.70	1.168 2.461	0.005	Age Group 40-49	2.188	1.499 3.193	<0.001				
				Age Group 50-59	1.876	1.280 2.750	0.001				

Qualitative findings: perceptions of factors relating to burnout

Table 4 details macro themes drawn from the comments section of the survey with illustrative comments. Unless explicitly stated, all are from different individual respondents. A total of 752 respondents provided comments for qualitative analysis (51% of the total respondents). Many described their perceptions of 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 burnout as a consequence of interactions with patients. Many rejected 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, for example, "you have failed to enquire about the most frustrating part i.e. mediocre, intransigent management and under-resourcing".

Table 4 Macro themes with subthemes and illustrative comments

Macro theme	Sub theme	Illustrative comments
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 shiftwork	
	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 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	

DISCUSSION

To our knowledge, this study is the first to assess levels of burnout among senior doctors and dentists working in New Zealand's public health system. This is also the first study to use the CBI in this cross-specialty cohort of medical professionals. 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. Our findings suggest that being female, aged between 30-39, having poor self-rated health status, and having worked for between 5-10 years in New Zealand are all factors associated with the highest levels of burnout. Working in emergency medicine is also associated with very high work-burnout.

The themes illustrated by the qualitative data provide insight to the issues to which respondents attribute their concerns. There is a clear emphasis on issues such as under-resourcing, workload, poor management and short staffing. The emphasis on working conditions in the qualitative comments suggest work and working conditions are perceived as significant contributing factors to overall feelings of exhaustion and fatigue.

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 experiencing personal and work-related burnout by 2.1 and 2.6 times respectively. Analysis of the qualitative comments found women were more likely to note issues associated with having young children in their comments than their male counterparts. This was particularly so for comments cross-cut by gender and age group. For example, one woman in the sub-group of 30-39 year olds who left comments noted that "I have a small toddler at home and am currently pregnant. Not sure what is more exhausting- work or home!".

The higher mean rates and prevalence of burnout for both men and women aged between 30-39 is consistent with findings from other studies.[17,18] The younger specialists in this cohort will be early on in their specialist career and may experience specific stressors as a consequence [19] although this was not probed directly. The findings from the multiple regression analysis suggest a clear drop off in burnout 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, experiencing severe illness or premature death. 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. One respondent referenced 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...". A third possibility is selective response to the survey. It is possible that the physicians aged over 60 who participated in this study may be a resultant pool of specialists who are better able to tolerate challenging conditions at work and resist fatigue and exhaustion;[20] analysis of the FTE and hours of work data for those aged over 60 for example, did not suggest that this cohort had lower average FTE or weekly hours of work than the overall average even though many physicians are reducing their hours of work when they reach this age group.

The findings from this study confirm trends in existing literature for certain medical specialties to experience higher rates of work-related and personal burnout than others.[21-25] Analysis of the comments left by emergency medicine specialists found emphasis on the tiring and burdensome realities of shift work and on-call duties as well as reference to the intense workloads of the public hospital emergency department. As one respondent noted: "I love emergency medicine [but] feel

frequently oppressed and worn out by the conditions in which we practice it, with volume overload, staff shortages, access block [and] lack of resources". The significant correlations between burnout and specific medical specialisations suggest that for medical specialties such as emergency medicine, there are major pressures that are negatively affecting morale. Again it is necessary to consider selection, as it is plausible that those seeking a career in emergency medicine are those who feel best able to cope with high intensity, stressful work. If this is the case then the findings are even more alarming. Given the strong connections noted in the literature between burnout, patient outcomes and likelihood of staff turnover, these trends warrant further research.

Burnout scores increased concurrently with increasing hours worked per week, consistent with findings in other studies using the CBI [for example 2] and the MBI.[26] Hours of work were also associated independently with the likelihood of personal and work-related burnout. The 61.5 average hours of work across the week found in this study was consistent with the average weekly hours for New Zealand doctors reported in other research.[13] The emphasis in the qualitative comments on issues associated with working shifts and on-call duties suggest that these factors may confer a higher risk of burnout.

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 percentage 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.[5] The relationship between burnout, hours of work and disturbed sleep, particularly in the context of shift work and night call duties common in this workforce should be researched further.

STRENGTHS AND LIMITATIONS OF THIS STUDY

A key strength of this study pertains to the multi-centre, cross specialty focus. Unlike many other 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 in all DHBs in New Zealand. The use of a validated instrument with a high internal consistency, having a large number of responses (although a moderate response rate) and attaining a representative spread of responses across gender and DHBs further adds to the power of this study. An additional strength of this study 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 a useful source of contextual information and revealed a great deal concerning individual's perceptions of the main attributional schemas contributing to their feelings of stress, anxiety and exhaustion.

There are, nonetheless, a number of limitations of this research which require consideration. The reliance of self-reporting, particularly for the hours of work questions, may have resulted in some under or over reporting of the data. It must also be questioned 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 have not but equally, it is possible that those with current high levels of burnout may have felt too exhausted to participate in the study.[27,28] A related limitation of the study were the

low numbers of responses in certain categories; for example there were only 3 respondents in the 20-29 age group although this reflects the Medical Council of New Zealand's (MCNZ) workforce survey [29] which recorded no specialists in this age group and only 28 medical officers.

It is also worth considering the extent to which the results are shaped by selective pressures acting over individuals' employment trajectories. Thus, it is plausible that certain specialities, such as emergency medicine, may attract those who have greater degrees of resilience to burnout (or alternatively, have less insight into the risk of experiencing it). It is also likely that there will be a process of attrition as those worst affected leave the workforce early. Another limitation pertains to the difficulties in establishing causality and directionality between the burnout scores and significant correlating factors. As a cross-sectional survey, the associations observed cannot be interpreted as causal but they certainly warrant further examination in future studies. Where relevant, this has been noted in the analysis.

Finally, and with the benefit of hindsight, the survey did not adequately capture some key issues. Thus, as noted by several respondents, the CBI was not able to probe directly feelings of stress and exhaustion that may be attributed to management related issues even though this emerged as a key concern in the qualitative analysis. The issue of dependents was also not queried explicitly and future research should include number and age of dependents as a variable against which to consider findings.

Notwithstanding these limitations, these results provide insight into the psychosocial health of the senior medical workforce in New Zealand and offer a model that could, subject to the adaptations noted in the previous paragraph, be applied in other countries. The high overall level of burnout suggested by this research is concerning, not only with regard to the health of this workforce, but also because of implications for the quality of patient care. The results indicate a need for a comprehensive response, which could be coupled with specific interventions targeted towards the sub-sections of this medical cohort who appear to be at greatest risk.

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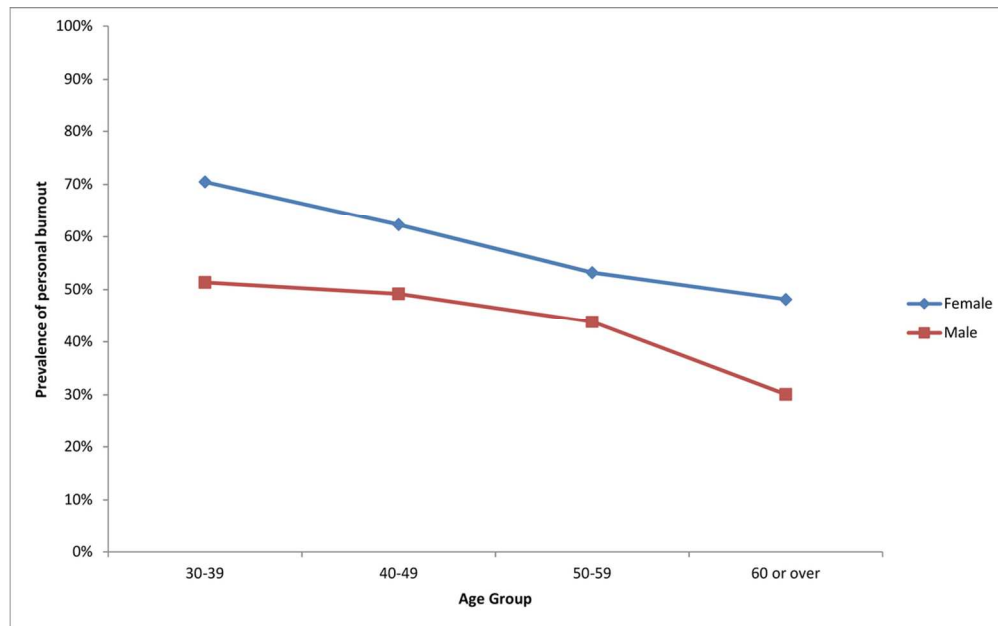


Figure 1

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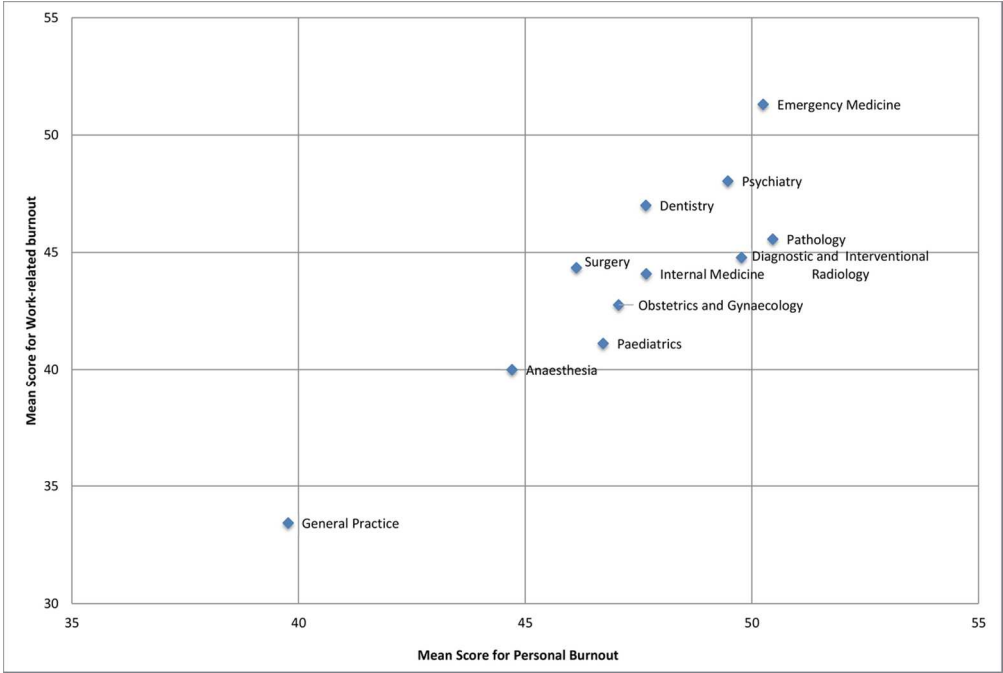


Figure 2

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Burnout prevalence in the New Zealand public hospital senior medical workforce: a cross-sectional mixed methods study

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ABSTRACT

Objectives: To explore the prevalence of, and associated factors contributing to, burnout among senior doctors and dentists working in the New Zealand public health system.

Design: Cross-sectional, mixed methods study.

Setting: New Zealand's 20 district health boards (DHBs).

Participants: A total of 1487 out of 3740 senior doctors and dentists who are members of the Association of Salaried Medical Specialists working in DHBs were recruited (response rate 40%).

Primary and secondary outcome measures: Gender, age, self-rated health status, vocation and hours of work per week were obtained from an electronic questionnaire. Burnout was measured using the Copenhagen Burnout Inventory. Qualitative data taken from an open-ended comments section was coded using grounded theory and used for contextual data.

Results: The overall prevalence of high personal burnout was 50%. Women aged <40 years had 71% prevalence of high personal burnout. Prevalence of high work-related burnout and patient-related burnout was 42% and 16% respectively. Those working in emergency medicine and psychiatry had significantly higher mean work-related burnout than other specialties ($p < 0.001$). On multi-variate analysis, having fair or poor health status (OR 10.8, 95%CI 6.8-17.1), working more than 14 consecutive hours (OR 1.43, 95%CI 1.12-1.82), and being a woman (OR 2.14, 95%CI 1.68-2.73) were independently associated with high personal and work-related burnout. Personal burnout rates decreased with age (age 30-39 OR 2.86, 95%CI 1.78-4.59, age 40-49 OR 2.45, 95%CI 1.70-3.55, age 50-59 OR 1.70, 95%CI 1.17-2.46, compared with age >60). Qualitative data emphasised intense and unrelenting workloads, under-staffing, onerous on-call duties and frustrations with management as factors contributing to burnout.

Conclusions: High burnout appears prevalent in New Zealand senior doctors and dentists. Many attribute their feelings of burnout to work conditions. These findings may assist with understanding contributors to burnout and with developing strategies to ameliorate the high burnout found across this cohort.

Strengths and limitations of this study:

This is the first study to report levels of burnout through the CBI in a multi-specialty nationwide survey of senior doctors and dentists in any country and offers an approach that could be emulated elsewhere. Consideration of the qualitative data alongside the statistical results provides insight into recurring factors perceived as contributing to feelings of burnout. The limitations of this study include a moderate participation rate, self-reported data and the cross-sectional design with its limitation of causal inference.

INTRODUCTION

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. Existing research suggests that doctors are very susceptible to burnout and have higher rates of burnout when compared with the general public.[1] Connections have been made between doctor’s propensity for burnout and long hours of work,[2] presenteeism,[3] shift work and on-call duties.[4-6]

Burnout is of concern for doctors not only because of the risk it poses to the health of those afflicted [7,8] and the loss of highly skilled professionals from the workforce [9,10] but also because of known correlations between burnout and reduced quality of care [11-13] and the risk of medical errors.[14, 15] Understanding and addressing high levels of burnout in doctors is likely to provide opportunities for improving the well-being of this critical workforce as well as enhancing the quality of patient care.

To our knowledge, no studies to date have screened for burnout specifically in senior doctors and dentists using the CBI in a multi-specialty, multi-centre nationwide survey. This study addresses this gap and aims to assess the prevalence of burnout in senior doctors and dentists of different medical specialties working in New Zealand’s public health system. A secondary aim of this research was to better understand which factors were perceived as contributing to burnout in this workforce. By combining qualitative and quantitative findings, this research captures not only the levels and correlates of the mental health and well-being of senior doctors and dentists working in New Zealand’s public health system but also some of the mechanisms through which they are affected. In this way it offers pointers to actions that could potentially improve the psychosocial health of this critical medical workforce.

METHODS

Participants and study design

The study involved members of the Association of Salaried Medical Specialists (ASMS) who are medical and dental specialists, and other non-specialist registered medical officers, employed by District Health Boards (DHB). DHBs provide both in-patient and out-patient health care for geographically defined populations within the New Zealand health system and are the main employers of health professionals working in the public sector. The ASMS is the professional association and union for senior doctors and dentists in New Zealand. For ease of description, these ASMS members are referred to throughout this report as senior doctors or as the senior medical workforce. The entire population of DHB-based members of ASMS (3,740 individuals) were invited by email to participate voluntarily in an anonymous electronic survey in November 2015. The survey was open for one month. 1,487 participants completed the survey giving a response rate of 40%. At the time of the survey the ASMS represented over 90% of all senior doctors and dentists and other non-vocationally registered medical specialists employed within the New Zealand public health system.

Burnout

The survey used the the Copenhagen Burnout Inventory (CBI) developed by Danish researchers Borritz and Kristensen.[16] While the Maslach Burnout Inventory (MBI) remains the most commonly used tool to screen for burnout, it has been subject to a number of criticisms, including correlations between emotional exhaustion, depersonalisation and personal accomplishment scales; the fact that it is only available commercially and its applicability to different cultural and workplace contexts.[16,17] In contrast to the more commonly used MBI, the CBI attempts to simplify the

concept of burnout to a state of emotional and physical exhaustion. This primary state of 'personal' burnout can then be ascribed to either work-related factors or specifically to work with clients, or in this research context, patients.[16,18] The CBI questionnaire contains 19 items, each scored on a five-item Likert-scale, with items collapsed into three sub-scales, relating to personal, work-related, and patient-related burnout. Only those with direct face to face contact with patients were invited to participate in the patient-related burnout section. Those who score equal to or above 50 on average in each of the three sub-scales are scored according to the instructions in the CBI as experiencing a high level of burnout. Prevalence scores are calculated by assessing the percentage of these individuals who score as 'burnt-out' (scores ≥ 50) as a percentage of the overall respondents within each sub-scale. Mean burnout scores for each sub-scale are calculated by averaging the scores for each line of questioning and calculating an overall average of the score.[16]

Independent variables

Additional questions were based on the Australian Medical Association's Risk Assessment checklist for 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.[19] Respondents were asked to estimate total hours of work for the week prior to completing the survey. Hours of work was defined as 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 (WHO) self-health assessment tool and demographic data including gender, age, length of time worked in New Zealand, Full Time Equivalent (FTE) (a formalised measure of employed weekly hours of work where 1 FTE is equal to 40 hours of work), primary DHB and medical specialty. Medical specialties were allocated to 11 broad categories to aid statistical analysis.

Statistical analysis

Data from the three CBI sub-scales were analysed for internal and criterion-related validity using Cronbach's alpha 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 variables specified above were tested using Spearman's rho, Chi-square and one-way ANOVA as appropriate with 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 and 95% confidence intervals.

Qualitative data analysis

Data from the comments section were imported into NVivo pro (version 11), read through in detail and open coded. This initial coding resulted in 41 detailed recurring themes emerging from the comments material. The qualitative data were subsequently re-read and selectively re-coded into five nested macro-themes and sub-themes by examining connections between themes and considering how frequently themes were expressed. This process followed the broad tenets of grounded theory where qualitative data is organised into emergent themes through iterative coding with the resultant themes understood to reflect the perspectives of the research participants.[20] 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 and selected specialties 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 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

The demographic composition, work and specialty details of the research participants is summarised in Table 1. 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 40-49 (39.1%) and had worked in New Zealand for between 15-30 years (44.2%). The mean hours of work for the respondents of the week immediately prior to completing the survey was 61.5 hours per week. The hours of private work were low (mean 5.3 hours per week) and on average most worked full time (mean FTE 0.9).

Table 1 Demographic characteristics of respondents (n=1487)

Gender	n	%	Total ASMS members
Male	857	59.8	2433
Female	575	40.2	1407
Age group			
20-29	3	0.2	
30-39	164	11.4	
40-49	563	39.1	
50-59	500	34.7	
>60	211	14.6	
Years worked in New Zealand			
Less than 5 years	144	10.0	
5-14 years	493	34.2	
15-30 years	637	44.2	
>30 years	167	11.6	
Self-rated Health Status			
Excellent	308	21.0	
Very Good	595	40.6	
Good	401	27.4	
Fair	142	9.7	
Poor	18	1.2	
Medical Specialty			
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	
Hours of work in week prior to survey			
Total Hours Worked	Mean	Range	
	61.5	0-168	
Private Hours Worked	5.3	0-100	
Full Time Equivalent (FTE)	0.9	0.2-1.7	
24-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	

Rates of burnout:

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. The mean burnout scores were strongly correlated ($p < 0.001$) with correlation coefficients r_s 0.820 for personal and work burnout, r_s 0.451 for patient and personal burnout and r_s 0.556 for work and patient-related burnout. Table 2 displays differences in mean burnout scores according to the variables recorded.

Proportionately, 50.1% of the respondents identified as having high personal burnout, 42.1% with high work-related burnout and 15.7% with high burnout attributed to interactions with patients. Female respondents were significantly more burnt-out than their male counterparts for personal and work-related burnout. 59.4% of women scored as having high personal burnout and 46.9% with high work-related burnout compared with 43.9% and 39% of males respectively ($p < 0.001$ and $p = 0.003$). Female respondents in the 30-39 year age bracket ($n = 88$) had very high prevalence of personal burnout (70.5%).

Those with a longer length of time working in the New Zealand public health system had significantly lower mean burnout scores for personal and work-related burnout. Those aged between 30-39 years ($n = 164$) had the highest mean personal burnout scores with burnout scores decreasing with age. (Figure 1). Mean burnout scores across all three sub-scales were significantly associated with worsening self-rated health status.

There were significant associations between specialty and mean work- and patient-related burnout. Those working in emergency medicine and psychiatry had the highest mean work-related burnout scores and those working in psychiatry and dentistry had the highest mean patient-related burnout scores. Figure 2 displays mean work-related burnout by personal burnout by specialty.

There were significant correlations between the total hours of work recorded by participants and mean personal and work-related burnout scores ($r_s = 0.098$, $p < 0.001$, $r = 0.125$, $p < 0.001$ respectively). There was a weak negative correlation ($r_s = -0.060$, $p = 0.021$) between the hours of private work and the personal burnout sub-scale score. There was no association between the FTE of the respondent and any of the mean burnout sub-scales although there was a weak association between the mean FTE and the proportion of those scoring as burnt-out in the work-related subscale ($p = 0.035$). Working more than 14 hours in the past week was significantly associated with higher mean personal and work-related burnout ($p < 0.001$). On a proportionate basis, the same trend held for personal and work-related burnout ($p = 0.003$ and $p < 0.001$ respectively). Not having had 24 hours free of work in the past week was strongly associated with higher mean personal and work-related burnout scores ($p < 0.001$). There was no association between the burnout scores across the sub-scales and whether or not the respondent had a period of rest of less than 10 hours in the past week.

Table 2 Mean burnout scores across three sub-scales and demographic variables

Variable:	Personal burnout			Work-related burnout			Patient-related burnout		
Gender	Mean	SD	p<0.001	Mean	SD	p<0.001	Mean	SD	p=0.395
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 & 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 Prevalence of personal burnout (%) by gender and age group

Figure 2 Mean work-related and personal burnout scores by medical specialty

Independent factors associated with burnout

As detailed in Table 3, a logistic regression demonstrated that those whose self-rated health status was fair or poor (grouped) had the highest odds ratio for burnout across all three burnout categories compared to those who self-rate their health as either very good or excellent (grouped). Those aged younger than 60 had a much higher risk of burnout, than those aged over 60 (reference group). Being female had an odds ratio of 2.1 for personal burnout and 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 (odds ratio 1.4 compared with not working 14 consecutive hours, p=0.004).

Table 3 Factors independently associated with burnout on multiple regression model

Personal Burnout				Work-Related Burnout				Patient-Related Burnout			
Variable	OR	95% C.I.	p	Variable:	OR	95% C.I.	p	Variable:	OR	95% C.I.	p
Total Hours Worked	1.006	1.004 1.012	<0.001	Total Hours Worked	1.006	1.002 1.010	0.005	Health Status 'Good'	1.605	1.154 2.232	0.005
Health Status 'Good'	4.44	3.398 5.798	<0.001	Working more than 14 consecutive hours	1.429	1.122 1.820	0.004	Health Status 'Fair & Poor'	2.583	1.705 3.913	<0.001
Health Status 'Fair & Poor'	10.78	6.798 17.085	<0.001	Health Status 'Good'	2.561	1.988 3.298	<0.001				
Female	2.14	1.679 2.728	<0.001	Health Status 'Fair & Poor' Female	8.640	5.688 13.124	<0.001				
Age Group 30-39	2.86	1.778 4.594	<0.001		1.501	1.184 1.903	0.001				
Age Group 40-49	2.45	1.695 3.546	<0.001	Age Group 30-39	1.959	1.218 3.152	0.006				
Age Group 50-59	1.70	1.168 2.461	0.005	Age Group 40-49	2.188	1.499 3.193	<0.001				
				Age Group 50-59	1.876	1.280 2.750	0.001				

Qualitative findings: perceptions of factors relating to burnout

Table 4 details macro themes drawn from the comments section of the survey with illustrative comments. Unless explicitly stated, all are from different individual respondents. A total of 752 respondents provided comments for qualitative analysis (51% of the total respondents). Many described their perceptions of 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 burnout as a consequence of interactions with patients. Many rejected 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, for example, "you have failed to enquire about the most frustrating part i.e. mediocre, intransigent management and under-resourcing".

Table 4 Macro themes with subthemes and illustrative comments

Macro theme	Sub theme	Illustrative comments
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 shiftwork	
	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 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	

DISCUSSION

To our knowledge, this study is the first to assess levels of burnout among senior doctors and dentists working in New Zealand's public health system. This is also the first study to use the CBI in this cross-specialty cohort of medical professionals. 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. 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 what is often found in human service workers,[18] although the patient-related burnout scores are similar to those found in other studies, and are in some instances lower.[2,21] The scores for personal and patient-related burnout are very similar to those found in study of German physicians which also had a similar sample size.[12] Our findings suggest that being female, aged between 30-39, having poor self-rated health status, and having worked for between 5-14 years in New Zealand are all factors associated with the highest levels of burnout. Working in emergency medicine and psychiatry is also associated with very high work-burnout and those working in psychiatry and dentistry had high patient-related burnout scores.

The themes illustrated by the qualitative data provide insight to the issues to which respondents attribute their concerns. There is a clear emphasis on issues such as under-resourcing, workload, poor management and short staffing. The emphasis on working conditions in the qualitative comments suggest work and working conditions are perceived as significant contributing factors to overall feelings of exhaustion and fatigue.

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 experiencing personal and work-related burnout by 2.1 and 2.6 times respectively. Analysis of the qualitative comments found women were more likely to note issues associated with having young children in their comments than their male counterparts. This was particularly so for comments cross-cut by gender and age group. For example, one woman in the sub-group of 30-39 year olds who left comments noted that "I have a small toddler at home and am currently pregnant. Not sure what is more exhausting- work or home!". These findings echo other recent studies which found that women had significantly higher personal burnout scores than their male counterparts.[23,24]

The higher mean rates and prevalence of burnout for both men and women aged between 30-39 is consistent with findings from other studies.[25,26] The younger specialists in this cohort will be early on in their specialist career and may experience specific stressors as a consequence [27] although this was not probed directly. The findings from the multiple regression analysis suggest a clear drop off in burnout 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, experiencing severe illness or premature death. 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. One respondent referenced 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...". A third possibility is selective response to the survey. It is possible that the physicians aged over 60 who participated in this study may be a resultant pool of specialists who are better able to tolerate challenging conditions at work and resist fatigue and exhaustion;[28] analysis of the FTE and hours of work data for those aged over 60 for example, did not suggest that this cohort had lower average FTE or weekly hours of work than the overall average even though many physicians are reducing their hours of work when they reach this age group.

The findings from this study confirm trends in existing literature for certain medical specialties to experience higher rates of work-related and personal burnout than others.[29-33] Analysis of the comments left by emergency medicine specialists, for example, found emphasis on the tiring and burdensome realities of shift work and on-call duties as well as reference to the intense workloads of the public hospital emergency department. As one respondent noted: “I love emergency medicine [but] feel frequently oppressed and worn out by the conditions in which we practice it, with volume overload, staff shortages, access block [and] lack of resources”. Comments left by psychiatrists highlighted the challenges of dealing with a growing incidence of mental illness and the concurrent pressure to treat greater numbers of patients without an increase in resources, echoing themes in the wider literature.[34] As the comment cited in in Table 4 suggests, psychiatrists suffering from burnout may score well against New Zealand Ministry of Health targets, because “burnt out psychiatrists become detached and disengaged, and therefore better 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.”

The significant correlations between burnout and specific medical specialisations suggest that for certain medical specialties, there are major pressures that are negatively affecting morale. Again it is necessary to consider selection, as it is plausible that those seeking a career in emergency medicine, for example, are those who feel best able to cope with high intensity, stressful work. If this is the case, then the findings are even more alarming. Given the strong connections noted in the literature between burnout, patient outcomes and likelihood of staff turnover, these trends warrant further research.

Burnout scores increased concurrently with increasing hours worked per week, consistent with findings in other studies using the CBI [2] and the MBI.[35] Hours of work were also associated independently with the likelihood of personal and work-related burnout. The 61.5 average hours of work across the week found in this study was consistent with the average weekly hours for New Zealand doctors reported in other research.[14] The emphasis in the qualitative comments on issues associated with working shifts and on-call duties suggest that these factors may confer a higher risk of burnout.[36]

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 percentage 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.[5] The relationship between burnout, hours of work and disturbed sleep, particularly in the context of shift work and night call duties common in this workforce should be researched further.

STRENGTHS AND LIMITATIONS OF THIS STUDY

A key strength of this study pertains to the multi-centre, cross specialty focus. Unlike many other 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 in all DHBs in New Zealand. The use of a validated instrument with a high internal consistency, having a large number of responses (although a moderate response rate) and attaining a representative spread of responses across gender and DHBs further adds to the power of this study. An additional strength of this study 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 a useful source of contextual information and revealed a great deal concerning individual's perceptions of the main attributional schemas contributing to their feelings of stress, anxiety and exhaustion.

There are, nonetheless, a number of limitations of this research which require consideration. The reliance of self-reporting, particularly for the hours of work questions, may have resulted in some under or over reporting of the data. It must also be questioned 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 have not but equally, it is possible that those with current high levels of burnout may have felt too exhausted to participate in the study.[18,37] A related limitation of the study were the low numbers of responses in certain categories; for example there were only 3 respondents in the 20-29 age group although this reflects the Medical Council of New Zealand's (MCNZ) workforce survey which recorded no specialists in this age group and only 28 medical officers.[38]

It is also worth considering the extent to which the results are shaped by selective pressures acting over individuals' employment trajectories. Thus, it is plausible that certain specialities, such as emergency medicine, may attract those who have greater degrees of resilience to burnout (or alternatively, have less insight into the risk of experiencing it). It is also likely that there will be a process of attrition as those worst affected leave the workforce early. Another limitation pertains to the difficulties in establishing causality and directionality between the burnout scores and significant correlating factors. As a cross-sectional survey, the associations observed cannot be interpreted as causal but they certainly warrant further examination in future studies. Where relevant, this has been noted in the analysis.

Finally, and with the benefit of hindsight, the survey did not adequately capture some key issues. Thus, as noted by several respondents, the CBI was not able to probe directly feelings of stress and exhaustion that may be attributed to management related issues even though this emerged as a key concern in the qualitative analysis. The issue of dependents was also not queried explicitly and future research should include number and age of dependents as a variable against which to consider findings. It should also explore working conditions and workload factors in this medical workforce in more detail, for example by surveys using validated tools such as the effort-reward imbalance questionnaire.

Notwithstanding these limitations, these results provide insight into the psychosocial health of the senior medical workforce in New Zealand and offer a model that could, subject to the adaptations noted in the previous paragraph, be applied in other countries. The high overall level of burnout suggested by this research is concerning, not only with regard to the health of this workforce, but also because of implications for the quality of patient care. The results indicate a need for a comprehensive response, which could be coupled with specific interventions targeted towards the sub-sections of this medical cohort who appear to be at greatest risk.[39]

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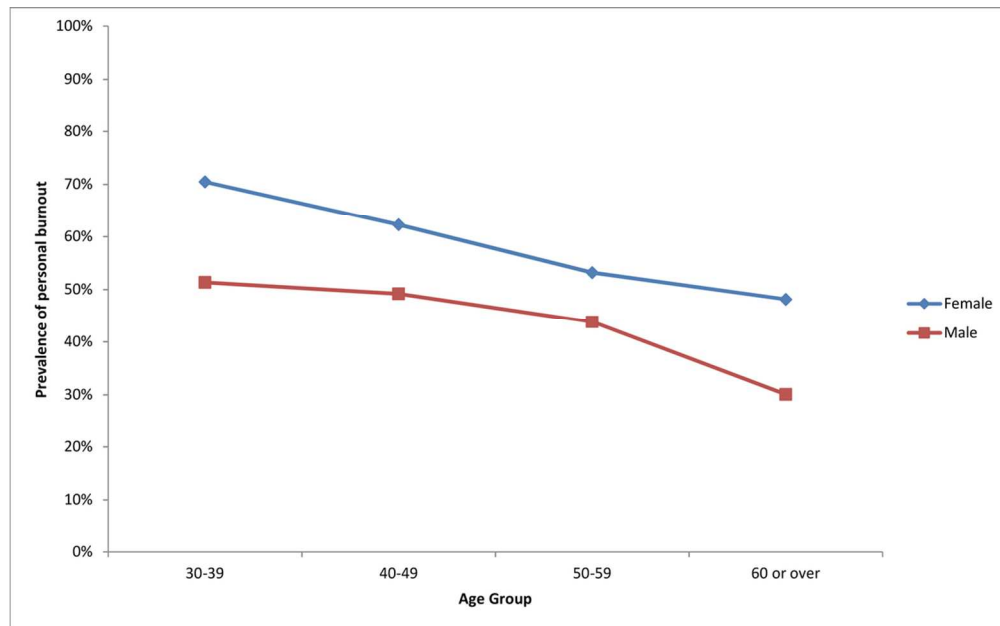


Figure 1

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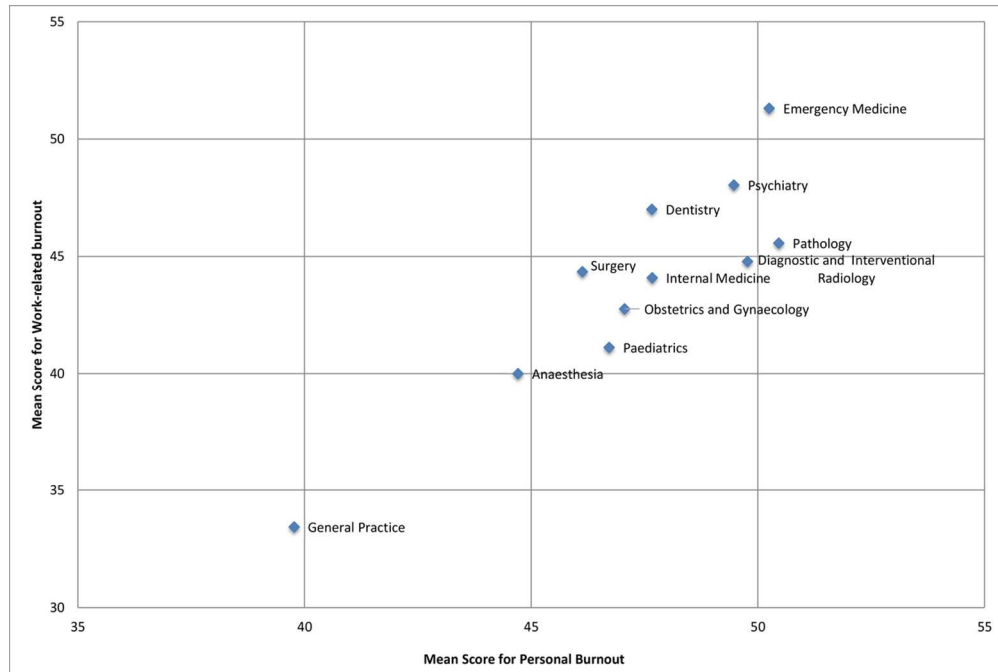


Figure 2

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