



Prepared for practice? Medical students' perceptions of a shortened final year medical programme

Anna J Dare, Keith J Petrie, Warwick Bagg

Abstract

Background In preparation to work as junior doctors (JD), University of Auckland final year medical students (FYMS) work as apprentices attached to hospital teams and general practices. Because of anecdotal evidence of student stress, a shortened academic year was introduced in 2007 (42 instead of 47 weeks).

Aim To determine FYMS perceptions of the final-year medical course and whether or not these perceptions changed in the cohort undergoing a shortened academic year.

Methods All 2006 FYMS completing a 47-week year, and all 2007 FYMS completing a shortened 42-week year, were invited to complete a questionnaire on the final academic day.

Results 116/136 (85.3%) and 118/132 (89.4%) of FYMS completed the questionnaire in the 2006 and 2007 cohorts respectively. Significantly fewer students in the 2007 cohort perceived that the year was "a little too long" (10.1% vs 24%, $p=0.001$), however this did not alter reported stress levels. The mean (\pm SD) Perceived Stress Scale's were 21.7 ± 7.0 (2006) and 21.2 ± 7.4 (2007), which are similar to the general population (19.6 ± 7.5 , range 0–45). Visual analog ratings (0–100) showed FYMS felt the programme was enjoyable 72.4 ± 18.1 , 73.9 ± 17.9 , despite feeling a degree of pressure 51.2 ± 21.3 , 47.19 ± 20.31 and fatigue 51.4 ± 20.3 , 53.2 ± 21.3 . FYMS were largely happy with their decision to become doctors 75.9 ± 18.5 , 76.2 ± 21.1 and felt mostly prepared 60.6 ± 18.7 , 62.3 ± 20.8 but anxious 63.1 ± 23.5 , 57.7 ± 24.4 about working as a JD the following year (all $p>0.05$). 76% and 73% of the 2006 and 2007 cohort reported being at least adequately prepared for their first house officer role (visual analogue score ≥ 50). Both the 2006 and 2007 cohorts considered their elective, general medical, general surgical, and radiology attachments of greatest use.

Conclusion Shortening the academic year did not significantly alter perceived stress levels, however significantly fewer students did report finding the year "too long". Although FYMS felt ready to work as JDs, they were anxious but not more stressed than the general population about this transition. Attachments that were most valued by FYMS were those that were most closely aligned with the first year JD role.

In preparation to work as junior doctors (JDs), University of Auckland final year medical students (FYMS) work as apprentices attached to hospital teams and general practices. The year serves as a transitional period between medical student and junior doctor in which students take on up to one-third of the team's clinical responsibility and workload, whilst still under the close supervision of junior and senior team members.

This year is unique to New Zealand and is highly valued by staff and students.¹ However, because of reports of student stress and fatigue, a shortened academic year was introduced in 2007. This reduced the length of the final year from 47 to 42 weeks. Internationally, a reduction in working hours has been associated with a decrease in psychological distress amongst medical and surgical residents,² but the impact of year length on stress has not been studied previously in medical students.

This study was conducted in order to evaluate the impact of the change in year length on perceived stress and feelings about the course amongst FYMS. The study also assessed the perceived length and value of each clinical attachment and that of the overall course.

A key stressor for FYMS is the transition from medical student to junior doctor.³⁻⁵ Both anxiety and preparedness for the first JD role have received attention in the literature in recent years. It has been appreciated that the construct of the final year course can influence anxiety, confidence, and competence levels amongst new graduates undertaking their first JD position.^{6,7}

In New Zealand, the aim of undergraduate medical education is to produce graduates with a broad generalist base⁸ and the clinical, procedural, and professional skills necessary for general registration. Constructing a course (that equips FYMS with broad generalist skills, and provides them with sufficient specialty experience whilst still preparing them adequately for their first JD role) involves finding a balance between the necessary breadth and depth within the curricula and across the different disciplines.

This study asked FYMS undertaking a 47 and 42-week course respectively to reflect on their experiences of the final year medical course at the University of Auckland.

Methods

Study population—All 2006 FYMS completing a 47-week year and all 2007 FYMS completing a shortened 42-week year, were invited to complete a questionnaire on the final academic day. The questionnaire was reviewed by staff members at the School of Medicine for comment on content, consistency, clarity, and potential for bias (prior to ethics approval and subsequent distribution).

Ethics approval—The questionnaire was anonymous and distribution and collection was undertaken by a third party. Ethics approval was obtained from the University of Auckland Human Participant's Ethics Committee (UAHPEC).

Survey design—The survey assessed 5 key components:

- Recent stress.
- Feelings about the final year medical course.
- The usefulness of the year's clinical attachments (general practice, medicine, obstetrics and gynaecology, procedural skills course, psychiatry, paediatrics, surgery, radiology, advanced cardiac life support course and the elective).
- The length of the attachments.
- The length of the year overall.

Stress was assessed using a 14-item stress questionnaire, the Perceived Stress Scale. This measure assessed how stressful students perceived their lives to be over the past month. Scale items are scored on a 5-point scale (0–4). Scores range from 0–4 with higher scores indicating greater perceived stress.⁸

Feelings about the final year's course were assessed using Likert scales of agreement on which students were asked to rate their satisfaction with their training, anxiety and preparedness to work as JDs.

Attachment usefulness was assessed on a scale of 1–10. Length of attachment was ranked on a 3-point

scale (1=too short,; 2=about right; 3=too long). Overall length of the year was assessed on a 5-point scale (1=far too; 5=far too long).

In 2007, the construct and length of the year was altered as outlined in Table 1. General medicine, general surgery, obstetrics and gynaecology, and paediatrics were reduced by 1 week. The attachment structure was altered so that there was more judicious use of “after hours” clinical contact, in order to allow students to continue to meet the overall learning outcomes of the course. The elective period was also reduced by 2 weeks. The advanced cardiac life support course and the procedural skills course were also rearranged, so that students participated in these courses prior to their medical and surgical attachments.

Table 1. Construct of the final medical school year: 47-week year (2006) versus 42-week year (2007)

Attachment	2006	2007
	47-week academic year	42-week academic year
General Medicine	7 weeks	6 weeks
General Surgery	7 weeks	6 weeks
Skills Week (ACLS, PSC, Unexplained medical symptoms)	0	1 week
Radiology	1 week	1 week
Paediatrics	6 weeks	5 weeks
Obstetrics/Gynaecology	6 weeks	5 weeks
General Practice	6 weeks	6 weeks
Psychiatry	4 weeks	4 weeks
Elective	10 weeks	8 weeks

Statistical analysis—Questionnaire responses were manually entered into an electronic spreadsheet. Statistical analysis was performed using Microsoft Excel and SPSS v15.0 software. Data are presented as mean \pm SD unless otherwise stated. Differences between the two cohorts of students were tested for significance using Chi-squared tests and the independent groups’ t-test. P values of less than 0.05 were defined as significant.

Results

The overall response rate in both years was high with 116/136 (85.3%) of the 2006 cohort and 118/132 (89.4%) of the 2007 cohort completing the questionnaire.

Baseline characteristics—The mean age of the 2006 and 2007 cohorts of FYMS were 25.0 and 25.2 respectively. In both cohorts there were a higher proportion of female students (57.8% and 60.2% respectively). The most common ethnic groups were European (33.6%, 30.5%), Chinese (18.1%, 21.2%), and Indian (9.5%, 10.2%). Māori students comprised 6.0% and 7.6% of the respondents respectively.

The most common mode of entry into medical school amongst respondents was the school leaver category (56%, 56.8%) followed by graduate admissions (27.6%, 15.3%). International students comprised 12.1% (2006) and 15.3% (2007) of those who responded. 2.6% of the respondents had entered via the Māori and Pacific admissions scheme (MAPAS) in the 2006 cohort of FYMS and 8.5% in the 2007 cohort.

Perceived stress—The mean Perceived Stress Scale score was 21.7, SD 7.0, for the 2006 cohort and 21.2, SD 7.4, for the 2007 cohort undertaking a shortened academic year ($p>0.05$). Furthermore, the Perceived Stress Scale scores obtained by the two cohorts of FYMS were similar to those in the general population (mean=19.6, SD=7.5, range 0–45) and to a general university student sample (mean=23.18, SD=7.31).⁹

Feelings about the course—Visual analogue ratings (0–100) showed that FYMS felt the medical programme was enjoyable (72.4±18.1, 73.9±17.9), although felt a degree of pressure (51.22±21.27, 47.19±20.31) and fatigue (51.4±20.3, 53.2±21.3). FYMS were largely happy with their decision to become doctors (75.9±18.6, 76.2±21.1). Most felt there was sufficient time to prepare for exams (57.21±22.1, 58.31±24.4). Feelings about the course and career decisions, were not significantly different ($p>0.05$) between the two cohorts.

Anxiety and preparedness—FYMS felt mostly prepared (60.6±18.7, 62.3±20.8) but anxious (63.1±23.5, 57.7±24.4) about working as a junior doctor the following year. Reassuringly, 76% and 73% of the 2006 and 2007 cohort reported being at least adequately prepared for their first house officer role (Visual analogue score ≥ 50). There was no significant difference ($p>0.05$) in feelings of either preparedness or anxiety between the two cohorts.

Length of the overall course—A significantly smaller proportion of the 2007 cohort undergoing the shorter academic year compared to the 2006 cohort undergoing the longer academic year, reported finding the length of the overall course length ‘a little too long’ (12±10.1 versus 34±29, $p=0.001$). See Figure 1.

Although a higher proportion of the 2007 cohort compared to the 2006 cohort reported finding the length of the overall course length ‘about right’ (62% in 2006 versus 73.7% in 2007) this trend did not reach significance ($p=0.069$). See Figure 1.

Usefulness of clinical attachments—The results for both cohorts are shown in Table 3. Overall for both cohorts, about two-thirds of students rated the usefulness of attachments as $\geq 7/10$. The exceptions to this were the perceived usefulness of obstetrics and gynaecology and psychiatry, where only approximately one-half and one-third of students respectively rated these as $\geq 7/10$.

Students in both the 2006 and 2007 cohorts ranked Medicine, Advanced Cardiac Life Support course, Procedural Skills course, and the Elective as being of the greatest use (scores of 9-10), followed by Radiology and Surgery. There was no significant difference ($p>0.05$) between cohorts as to the usefulness of any of the ten clinical attachments. Refer to Table 2.

Length of clinical attachments—The majority of students in both cohorts felt that all attachment lengths were “about right”. However, approximately one-third of both cohorts felt that ACLS, the procedural skills course and the radiology attachments were too short. Similarly, between 27–47% of both cohorts felt that general practice. Obstetrics and gynaecology and psychiatry were too long (Table 3).

Figure 1. Student perceptions on length of the overall course in 2006 versus 2007

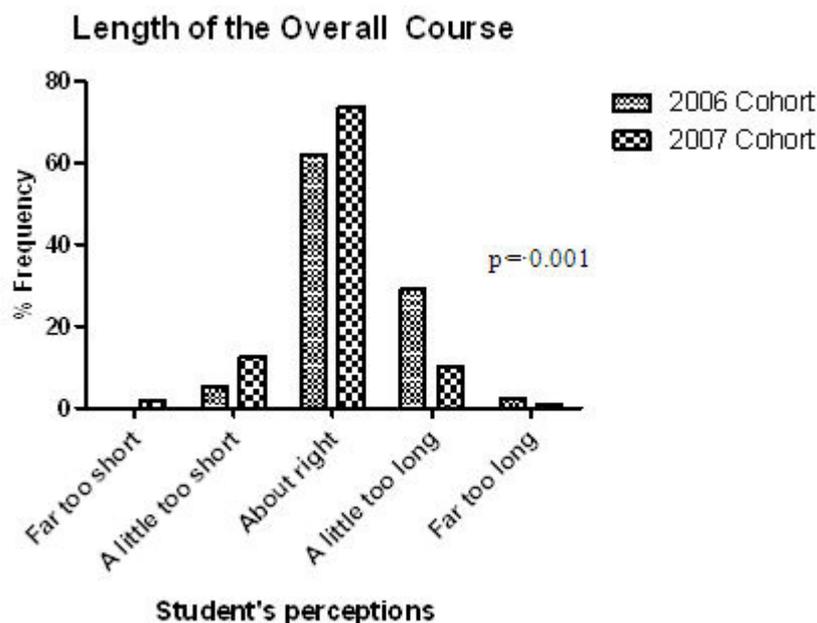


Table 2. Usefulness of attachments
(1=not useful at all; 10=extremely useful)

Attachments	2006 Cohort	2007 Cohort
	n=116	n=118
ACLS		
1 to 3 (%)	0(0)	1(0.8)
4 to 6 (%)	4(3.5)	4(3.3)
7 to 8 (%)	18(15.5)	21(17.8)
9 to 10 (%)	83(71.6)	75(63.6)
Elective		
1 to 3 (%)	4(3.5)	8(6.7)
4 to 6 (%)	14(12)	15(12.6)
7 to 8 (%)	24(20.7)	23(19.5)
9 to 10 (%)	62(53.4)	56(47.4)
General Practice		
1 to 3 (%)	4(3.5)	7(5.9)
4 to 6 (%)	27(23.3)	25(21.1)
7 to 8 (%)	46(39.7)	47(39.7)
9 to 10 (%)	28(24.1)	23(19.4)
Medicine		
1 to 3 (%)	0(0)	2(1.7)
4 to 6 (%)	1(.9)	3(2.5)
7 to 8 (%)	24(20.7)	38(32.3)
9 to 10 (%)	80(69)	59(49.9)
Obstetrics/Gynaecology		
1 to 3 (%)	11(9.5)	9(7.6)
4 to 6 (%)	44(29.4)	36(30.5)
7 to 8 (%)	39(33.6)	48(32.1)
9 to 10 (%)	21(18.1)	18(15.2)

Procedural Skills		
1 to 3 (%)	1(0.9)	0(0)
4 to 6 (%)	9(7.8)	10(8.4)
7 to 8 (%)	29(25)	31(26.3)
9 to 10 (%)	63(54.3)	61(51.6)
Psychiatry		
1 to 3 (%)	9(14.6)	10(8.4)
4 to 6 (%)	34(29.2)	49(27.3)
7 to 8 (%)	40(24.5)	35(29.6)
9 to 10 (%)	14(12.1)	8(6.7)
Paediatrics		
1 to 3 (%)	3(2.6)	3(2.5)
4 to 6 (%)	26(22.4)	21(17.7)
7 to 8 (%)	51(43.9)	49(41.5)
9 to 10 (%)	25(21.5)	29(24.6)
Radiology		
1 to 3 (%)	5(4.4)	7(5.9)
4 to 6 (%)	19(16.4)	15(12.7)
7 to 8 (%)	45(38.8)	47(39.8)
9 to 10 (%)	36(31)	33(28)
Surgery		
1 to 3 (%)	2(1.7)	29(1.7)
4 to 6 (%)	10(8.6)	9(7.6)
7 to 8 (%)	45(38.7)	50(42.4)
9 to 10 (%)	48(41.4)	40(33.9)

There was no significant difference in perceptions between the two cohorts as to the length of attachment for the Advanced Cardiac Life Support course, Medicine, Obstetrics and Gynaecology, Procedural Skills course, Paediatrics and Radiology, or the Elective. There was a statistically significant difference between course length perceptions for the attachments of psychiatry and surgery.

The 2007 cohort, had a higher percentage of respondents who believed the psychiatry attachment was too long, compared to the 2006 cohort (46.6% in 2007 vs 31% in 2006, $p=0.04$), although the length of this attachment did not change between 2006 and 2007.

There was also a statistically significant difference between the two cohorts for course length perceptions for the surgery attachment; however this occurred in the opposite direction to that of psychiatry. A higher percentage of 2007 respondents found the surgery attachment too short (29.7% in 2007 vs 8.6% in 2006, $p=0.001$).

Table 3. Attachment lengths as perceived by students in 2006 versus 2007

Attachments	2006 Cohort	2007 Cohort
ACLS		
1 = too short (%)	38(32.8)	31(26.3)
2 = about right (%)	70(60.3)	84(71.2)
3 = too long (%)	2(1.7)	0(0)
Elective		
1 = too short (%)	16(13.8)	7(5.9)
2 = about right (%)	84(72.4)	93(78.8)
3 = too long (%)	9(7.8)	15(12.7)
General Practice		
1 = too short (%)	5(4.3)	4(3.4)
2 = about right (%)	73(62.9)	78(66.1)
3 = too long (%)	32(27.6)	34(28.8)
Medicine		
1 = too short (%)	15(12.9)	23(19.5)
2 = about right (%)	92(79.3)	91(77.1)
3 = too long (%)	2(1.7)	2(1.7)
Obstetrics/Gynaecology		
1 = too short (%)	1(.9)	6(5.1)
2 = about right (%)	63(54.3)	70(59.3)
3 = too long (%)	45(38.8)	37(31.4)
Procedural Skills		
1 = too short (%)	36(31)	29(24.6)
2 = about right (%)	70(60.3)	82(69.5)
3 = too long (%)	1(0.9)	4(3.4)
Psychiatry		
1 = too short (%)	4(3.4)	2(1.7)
2 = about right (%)	69(59.5)	58(49.2)
3 = too long (%)	36(31)	55(46.6)
Paediatrics		
1 = too short (%)	2(1.7)	7(5.9)
2 = about right (%)	87(75)	93(78.8)
3 = too long (%)	21(18.1)	15(12.7)
Radiology		
1 = too short (%)	28(24.1)	32(27.1)
2 = about right (%)	77(66.4)	79(66.9)
3 = too long (%)	3(2.6)	5(4.2)
Surgery		
1 = too short (%)	10(8.6)	35(29.7)
2 = about right (%)	90(77.6)	77(65.3)
3 = too long (%)	10(8.6)	4(3.4)

Discussion

Overall, students were happier with a shortened, 42-week academic year. However, shortening the academic year did not change students' perceived stress scores, feelings of pressure, fatigue, or anxiety. Despite differing academic year lengths students felt similar preparedness for work.

FYMS at the University of Auckland are anxious, but demonstrate similar levels of stress, to other university students and levels in the general population. The pervasive nature of stress in medical school is discussed widely in the medical literature, and is

a common theme in reports (both anecdotal and substantive) of experiences at both a medical student and junior doctor level.^{10,11} However, the findings of this study are in keeping with studies suggesting that medical students experience similar stress to other students (e.g. law and graduate students and the general population)¹⁰ although, they do suffer a higher rate of psychiatric and mood related disturbances.^{10,12}

The transition from medical student to junior doctor has been identified as being a stressful period in ones training⁴ and was a transition facing the FYMS surveyed in this study. The results of this study affirm that while FYMS feel prepared to work as junior doctors, most feel anxious about making the transition into working life.

Shortening the academic year length by 5 weeks did not significantly alter feelings of stress, anxiety, or preparedness. This suggests that sources of stress and anxiety amongst FYMS are less likely to be related to the course length or leave time, and may be more likely related to FYMS' perceived competence and confidence in making the transition into the junior doctor years. Factors influencing anxiety amongst FYMS may include task-preparedness, appreciation of increasing role-responsibility, as well as pre-existing tendencies to anxious traits.^{3,4,11,13,14}

In part, the shortening of the academic year may have helped in some of these areas, as parts of the course were restructured. For example, the ACLS and procedural skills course were undertaken prior to the medical and surgical attachments and may have enhanced the quality of learning.

Perceptions around the overall year length tended to be in favour of the shortened (42 week) course length as being 'about right.' While the majority of students undertaking the longer academic year in 2006 were happy with the overall course length, a significant proportion had felt the year was "a little too long". The initiative to shorten the year length came about after students reported feeling stressed and fatigued, partly due to the short break between final examinations at the end of Year 5, and the start of the final year, 3 weeks later.

There were concerns initially that shortening the academic year may increase stress placed on students, who had to achieve the same outcomes with reduced contact time, but this does not appear to have occurred. However, increased pressure and stress as a result of reduced contact time across the year may have been offset by the longer period of leave between the end of fifth year and the start of the final year that now occurs with the shortened course.

Shortening the academic year did not significantly alter the perceived usefulness of each of the clinical attachments, except for the general medicine attachment, which the 2006 cohort rated more useful than the 2007 cohort ($p=0.004$). Attachments that were rated as being very useful—namely medicine, surgery, procedural skills, ACLS, and the elective—were either attachments that form the basis of the first postgraduate provisional registration year (medicine and surgery), or attachments that were predominantly procedurally based (ACLS, procedural skills course).

General practice, psychiatry, obstetrics and gynaecology and paediatrics are not routine first-year house officer attachments, and this may have impacted on the perceived usefulness of these attachments by FYMS, whose learning is predominantly focused towards preparation for their first house officer position.⁵

Interestingly, attachment length perceptions did not significantly alter between the 2006 cohort and the 2007 cohort for obstetrics and gynaecology and paediatrics, despite these two attachments being shortened by one week (one-sixth of the attachment) in 2007. This may be explained again by the fact that FYMS are focused towards preparation for their first house officer role, of which paediatrics and obstetrics and gynaecology are not routine rotations.

Another attachment that was significantly shortened in 2007 was the elective—this was reduced from 10 weeks to 8 weeks. Despite initial resistance amongst the 2007 cohort when the shortened elective was introduced, 79% of this cohort felt the elective length was ‘about right’, only 6% thought it was ‘too short’ and there was no significant difference in length perceptions compared to the 2006 cohort whom had undertaken the longer (10-week) elective.

Over a quarter of respondents in both cohorts reported finding their obstetrics and gynaecology, general practice, and psychiatry attachments ‘too long.’ In contrast, over one-quarter of both cohorts reported finding the ACLS, procedural skills, and radiology courses as being ‘too short.’ We hypothesise that this may reflect the drive of students towards a curriculum constructed to prepare them for their first house officer role and away from speciality areas that do not form a core component of their first house officer year.

Another possibility is that the quality of the experiences on these attachments is not optimal. For example, in obstetrics and gynaecology, tensions between various healthcare workers over access to births has been reported as affecting the quality of experience for medical students on these attachments.¹⁵ Similarly, low morale in general practice in New Zealand is reported¹⁶ and this may have flow on effects in terms of the learning experience of students on this attachment.

The surgical rotation, which was shortened by 1 week down to 6 weeks in 2007, was perceived to be too short by a significantly higher proportion of students in 2007 (almost one-third of the class) compared to the 2006 cohort. General surgery is a MCNZ Category A post and thus a routine rotation in the first JD year prior to achieving registration. General surgical skills contribute heavily to both the University and the Medical Council’s lists of indicative skills to be acquired across the final year of medical school and the first JD year.^{17,18}

A 6-week surgical rotation, comprising of 1 week of emergency medicine and 5 weeks of general surgery (or 3 weeks of general surgery and 2 weeks of specialty surgery) may not provide sufficient time or opportunity for FYMS to achieve the necessary learning outcomes for the attachment, nor the exposure to a range of surgical conditions likely to be encountered in their first JD role for some students. Whether this is simply a perception among students, or a reality of the reduced attachment length, requires further investigation.

FYMS perceptions around the usefulness and the length of clinical attachments raise interesting points for debate as to what a final year curricula should incorporate. General medicine and general surgery were rated the most useful attachments by both cohorts. Whether this is because these disciplines feature so heavily in the first postgraduate year or whether they are foundational to all medical practice, and as such, rate highly, is beyond the scope of this study to answer.

New Zealand faces a shortage of general practitioners, psychiatrists, rural practitioners, and pathologists. It is acknowledged that positive exposure to a vocation at an undergraduate level influences later career choice,^{19,20} and in the case of specialties which are held in low esteem amongst students, may help overcome previously held assumptions and misconceptions.²¹ Hence, there has been an argument in recent years for increased exposure within the medical course to areas such as general practice, especially rural general practice, and psychiatry.²⁰

Psychiatry and general practice attachments were not shortened—yet FYMS in this study did not find these attachments as useful as other rotations in their final year course. Again this may be because these attachments are not routine first year house officer rotations, and because they are designed to achieve outcome change at a vocational training level, rather than at PGY1.

Conclusion

Readiness to work, tempered with a degree of anxiety about making the transition to the JD role, is a feature of FYMS at the end of their medical undergraduate training. FYMS are happy with their decision to become doctors, and are not more stressed than the general population. Shortening the academic year was welcomed, but did not significantly alter perceived stress nor readiness to work as JDs.

Attachments that are considered the most useful by FYMS are those that are geared towards preparation for the first JD role—namely general medicine, general surgery, ACLS, and the procedural skills course, raising interesting points for debate around the objectives and construct of the final year medical curriculum.

These findings are of benefit to those designing a final year medical undergraduate curricula in order to meet the immediate and more long-term needs of FYMS as they transition into professional life.

We acknowledge that the study has some limitations. The survey was distributed on the final day of the academic year, after students had been given their final grades indicating they had passed the year. This may have positively biased responses to questions on perceived stress and feelings about the course. Conversely, anxiety levels may have been higher at the time of surveying as FYMS started their first house officer positions, a known stressor, in the fortnight following when the survey was conducted.

A further limitation is that students' self reported preparedness for the Junior Doctor role was sought prior to them commencing the JD year and thus their responses are based on perceptions of what they believed was required of them for the JD year, rather than what they actually experienced upon commencing the JD role.

Competing interests: None known.

Author information: Anna J Dare, Final Year Medical Student, Faculty of Medical and Health Sciences, University of Auckland, Auckland; Keith J Petrie, Professor of Health Psychology, Faculty of Medical and Health Sciences, University of Auckland, Auckland; Warwick Bagg, Associate Dean (Medical Programme) and Associate Professor in Medicine, Faculty of Medical and Health Sciences, University of Auckland, Auckland

Correspondence: Associate Professor Warwick Bagg, Associate Dean (Medical Programme), Faculty of Medical and Health Sciences, University of Auckland, Private Bag 92019, Auckland Mail Centre, Auckland, New Zealand. Email: w.bagg@auckland.ac.nz

References:

1. Adair V, Tuck B. The undergraduate programme in medicine at the Auckland School of Medicine: Graduate perceptions and career pathways. University of Auckland, Auckland, 2005).
2. Zare S, Galanko J, Behrens K, Farrell T. Psychologic well-being of surgery residents after inception of the 80 hour workweek: A multi-institutional study. *Surgery*. 2005;138:150–7.
3. Jones A, McArdle P, O'Neill P. How well prepared are graduates for the role of pre-registration house officer? A comparison of the perceptions of new graduates and educational supervisors. *Medical Education*. 2001;35:578–84.
4. Brown J, Chapman T, Graham D. Becoming a new doctor: a learning or survival exercise? *Medical Education*. 2007;41:653–60.
5. Dare A, Fancourt N, Elizabeth Robinson, , et al. Training the Intern: the value of a pre-intern year in preparing students for practice. Accepted Medical Teacher January 2009..
6. Tomorrow's Doctors. General Medical Council, London, 1993.
7. Watmough S, Garden A, Taylor D. Pre-registration house officers' views in studying under a reformed medical curriculum in the UK. *Medical Education*. 2006;40:893–9.
8. Reshaping Medical Education and Training to Meet the Challenges of the 21st Century. A report to the Ministers of Health and Tertiary Education from the Workforce Taskforce. Ministry of Health, Wellington, 2007.
9. Cohen S, Kamatck T, Mermelstein R. A Global Measure of Perceived Stress. *J Health and Social Behaviour* 1983;24:385–96.
10. Helmers K, Danoff D, Steinert Y, et al. Stress and depressed mood in medical students, law students and graduate students at McGill University. *Academic Medicine*. 1997;72:708–14.
11. Firth, J. Levels and sources of stress in medical students. *British Medical Journal Clinical Research Ed*. 1986;292:1177–80.
12. Dickstein L, Stephenson J, Hinz L. Psychiatric impairment in medical students. *Academic Medicine*. 1990;65:558–93.
13. Evans D, Wood D, Roberts C. The effect of an extended hospital induction on perceived confidence and assessed clinical skills of newly qualified pre-registration house officers. *Medical Education*. 2004;38:998–1001.
14. Chandavarkar U, Azzam A, Mathews C. Anxiety symptoms and perceived performance in medical students. *Depression and Anxiety* 24, 103-111 (2007).
15. Curry M. Would somebody please have a normal vaginal delivery? [letter]. *N Z Med J*. 2007;120(1256). <http://www.nzmj.com/journal/120-1256/2595>
16. Dowell A, Coster G, Maffey C. Morale in general practice: crisis and solutions. *N Z Med J*. 2002;115(1158). <http://www.nzmj.com/journal/115-1158/102>
17. Education, training and supervision for new doctors. MCNZ, Wellington, 2006.
18. School of Medicine: 2007 Phase 3 (TI) Guidebook. University of Auckland, Auckland, 2007.
19. Saigal P, Takemura Y, Nishiue T, Fetters M. Factors considered by medical students when formulating their specialty preferences in Japan: findings from a qualitative study. *BMC Medical Education*. 2007;7:31.
20. Ranmuthugala G, Humphreys J, Solarsh B, et al. Where is the evidence that rural exposure increases uptake of rural medical practice? *Australian Journal of Rural Health*. 2007;15:285–8.

21. Holm-Peterson C, Vinge S, Hansen J, Gyrd-Hansen D. The impact of contact with psychiatry on senior medical students' attitudes toward psychiatry. *Acta Psychiatrica Scandinavica*. 2007;116:235–7.