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The association between trainee demographic factors and self-reported experience: Analysis of General Medical Council National Training Survey 2014 and 2015 data

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Summary

Objectives: To investigate whether demographic factors are associated with self-reported experience amongst medical trainees in the UK.
Design: Retrospective analysis of survey data.
Setting: General Medical Council (UK) National Training Survey data for 2014 and 2015.
Participants: A total of 105,549 responses were provided from 68,551 participants when no data were removed. After removing data to preserve participant anonymity, there were 64,278 participants providing 99,076 responses.
Main outcome measures: Considered trainee factors were gender, ethnicity, country of primary medical qualification, grade, post specialty and deanery. Self-reported outcome measures were 'overall satisfaction', 'adequate experience', 'workload', 'clinical supervision', 'educational supervision', and 'access to educational resources'.
Results: The experience of medical trainees across various indicators is differentially related to gender, ethnicity, country of primary medical qualification, grade, post specialty and deanery.
Conclusions: It is demonstrated here that trainee factors are associated with subjective experience across different indicators. Further work is required to explore the reasons behind this, and how this relates to trainee quality of life, work performance and career progression.

Keywords

Medical careers, medical education, General Medical Council, National Training Survey, experience, training, National Health Service

Introduction

The medical workforce in the UK is demographically diverse.[1–3] Both undergraduate and postgraduate performance have been shown to vary across different groups, with associated factors including gender,[4,5] ethnicity,[5–9] and country of primary medical qualification.[3,10,11]

Ongoing progress is being made to explore the mechanism relating such demographic factors to performance.[4,6,9,12–16] It is likely that subjective experience also plays a role.[11,17] This may differ depending on grade,[18,19] specialty,[20] and deanery of training.[21–23]

The General Medical Council National Trainee Survey monitors the quality of training and education of all doctors in the UK annually.[24] In 2014 and 2015, it collected survey responses to quantify the subjective experience of trainees to include the indicators 'overall satisfaction', 'adequate experience', 'workload', 'clinical supervision', 'educational supervision', and 'access to educational resources'.[24] Trainee gender, ethnicity, country of primary medical qualification, grade, post (rather than programme of training) specialty and deanery were also included.[24] General Medical Council National Trainee Survey data for 2014 and 2015 were analysed to investigate whether trainee demographic factors are associated with self-reported experience.

Methods

This research has been undertaken using the results of the National Trainee Survey data set available on application from the General Medical Council. The questions asked in the 2014 and 2015 survey are included in Supplementary Files 1 and 2, and can be accessed at www.gmc-uk.org/education/nts_documents.asp. A user guide which details how the indicators are scored is included in Supplementary File 3 and can also be found at www.gmc-uk.org/NTS_reporting_tool_user_guide.pdf_48363475.pdf. Prior to release from the General Medical Council, data were anonymised by replacing respondent identifiers and removing responses from doctors in training where there were fewer than three respondents sharing the same demographic characteristics. A total of 6473 out of 105,549 (6.1%) cases were removed, and a breakdown by each category is shown in Table 1.

Though reported as numerical outcomes within a 100 point scale, measures of subjective experience were not continuous, and were thus modelled as ordered categorical variables. The considered

Table 1. Summary of responses for each of the trainee factors considered.

	Number (including excluded responses)	Number of responses removed	Percentage of responses removed (%)	Number (excluding removed responses)	Percentage (%)	Overall satisfaction; median (IQR)	Adequate experience; median (IQR)	Work load; median (IQR)	Clinical supervision; median (IQR)	Educational supervision; median (IQR)	Access to educational resources; median (IQR)
Year of NTS											
2014	52,588	3252	6	49,336	49.8	84 (20)	80 (20)	44 (27)	91 (11)	100 (25)	71 (19)
2015	52,961	3221	6	49,740	50.2	84 (24)	80 (30)	50 (25)	91 (11)	100 (25)	71 (19)
Gender											
Man	46,858	3210	7	43,648	44.06	84 (20)	80 (20)	50 (27)	91 (10)	100 (25)	71 (20)
Woman	58,691	3263	6	55,428	55.94	84 (20)	80 (20)	50 (27)	91 (14)	100 (25)	71 (19)
Ethnicity											
White	62,375	2134	3	60,241	60.8	80 (24)	80 (30)	44 (27)	91 (11)	100 (25)	71 (20)
BME	37,176	2339	6	34,837	35.16	84 (20)	80 (20)	50 (29)	91 (11)	100 (25)	71 (19)
Unspecified	5998	2000	33	3998	4.04	80 (20)	80 (20)	44 (27)	91 (15)	100 (25)	66 (23)
Migration status											
UK	88,265	2734	3	85,531	86.33	84 (20)	80 (30)	44 (27)	91 (14)	100 (25)	71 (19)
EEA	3897	1809	46	2088	2.11	84 (24)	80 (30)	44 (27)	94 (14)	100 (25)	71 (20)
Other	13,387	1930	14	11,457	11.56	84 (16)	80 (10)	50 (25)	95 (11)	100 (25)	73 (15)
Specialty											
Anaesthetics	9205	519	6	8686	8.77	88 (16)	90 (20)	56 (19)	95 (10)	100 (25)	73 (18)
Emergency medicine	6241	521	8	5720	5.77	84 (16)	90 (20)	31 (19)	90 (14)	100 (25)	70 (18)
General practice	12,285	426	3	11,859	11.97	92 (20)	90 (20)	58 (25)	95 (11)	100 (0)	75 (18)
Medicine	30,219	691	2	29,528	29.8	80 (20)	80 (20)	42 (25)	91 (15)	100 (25)	69 (20)
Obstetrics and gynaecology	5875	590	10	5285	5.33	80 (16)	80 (20)	50 (19)	91 (15)	100 (25)	70 (18)
Occupational medicine	138	113	82	25	0.03	80 (20)	90 (30)	58 (25)	89 (13)	75 (25)	71 (18)

(continued)

Table 1. Continued.

	Number (including excluded responses)	Number of responses removed	Percentage of responses removed (%)	Number (excluding removed responses)	Percentage (%)	Overall satisfaction; median (IQR)	Adequate experience; median (IQR)	Work load; median (IQR)	Clinical supervision; median (IQR)	Educational supervision; median (IQR)	Access to educational resources; median (IQR)
Ophthalmology	1368	514	38	854	0.86	88 (16)	90 (20)	50 (21)	95 (14)	100 (25)	75 (19)
Paediatrics and child health	8874	579	7	8295	8.37	84 (16)	80 (10)	44 (25)	92 (10)	100 (25)	71 (16)
Pathology	1440	492	34	948	0.96	88 (16)	80 (20)	58 (25)	95 (10)	100 (25)	75 (20)
Psychiatry	7840	647	8	7193	7.26	84 (20)	80 (20)	58 (19)	94 (13)	100 (25)	73 (17)
Public health	459	209	46	250	0.25	84 (20)	80 (20)	68 (17)	94 (11)	100 (25)	79 (23)
Radiology	3158	543	17	2615	2.64	84 (16)	80 (20)	56 (25)	95 (13)	100 (25)	75 (16)
Surgery	18,447	629	3	17,818	17.98	80 (24)	80 (20)	44 (25)	91 (15)	100 (25)	68 (20)
Grade											
Foundation	29,946	1605	5	28,341	28.61	80 (24)	80 (20)	42 (31)	87 (18)	100 (25)	69 (20)
Core/lower	47,596	2499	5	45,097	45.52	84 (20)	80 (20)	50 (25)	91 (10)	100 (25)	71 (18)
Higher ST4+	28,007	2369	8	25,638	25.88	84 (20)	80 (20)	50 (21)	95 (10)	100 (25)	71 (18)
Deanery											
Defence Postgraduate Medical	607	97	16	510	0.51	88 (20)	90 (20)	50 (29)	94 (13)	100 (25)	73 (20)
East Midlands Healthcare Workforce	6081	368	6	5713	5.77	80 (20)	80 (20)	50 (29)	91 (14)	100 (25)	70 (21)
East of England Multi-Professional	6371	426	7	5945	6	80 (20)	80 (20)	44 (27)	91 (11)	100 (25)	71 (19)
Kent, Surrey and Sussex	6904	296	4	6608	6.67	80 (20)	80 (20)	44 (27)	91 (15)	100 (25)	71 (20)
London	18,381	383	2	17,998	18.17	84 (20)	80 (30)	44 (25)	91 (10)	100 (25)	70 (20)
Mersey	4774	387	8	4387	4.43	84 (24)	80 (30)	50 (25)	91 (14)	100 (25)	71 (19)

(continued)

Table 1. Continued.

	Number (including excluded responses)	Number of responses removed	Percentage of responses removed (%)	Number (excluding removed responses)	Percentage (%)	Overall satisfaction; median (IQR)	Adequate experience; median (IQR)	Work load; median (IQR)	Clinical supervision; median (IQR)	Educational supervision; median (IQR)	Access to educational resources; median (IQR)
NHS Education for Scotland (East Region)	991	238	24	753	0.76	84 (24)	80 (30)	50 (21)	91 (15)	100 (25)	71 (20)
NHS Education for Scotland (North Region)	1389	290	21	1099	1.11	84 (24)	80 (20)	50 (29)	91 (14)	100 (25)	70 (21)
NHS Education for Scotland (South-East)	2520	309	12	2211	2.23	84 (20)	80 (20)	50 (25)	91 (10)	100 (25)	71 (21)
NHS Education for Scotland (West Region)	5053	336	7	4717	4.76	84 (20)	80 (30)	50 (31)	91 (14)	100 (25)	71 (21)
NHS West Midlands Workforce	8718	401	5	8317	8.39	84 (20)	80 (20)	50 (25)	91 (10)	100 (25)	73 (15)
North Western	7166	367	5	6799	6.86	84 (16)	80 (30)	50 (25)	91 (14)	100 (25)	71 (17)
Northern	5057	373	7	4684	4.73	84 (20)	80 (20)	50 (29)	95 (14)	100 (25)	72 (18)
Northern Ireland Medical & Dental	3258	231	7	3027	3.06	84 (20)	80 (30)	44 (27)	92 (10)	100 (25)	71 (20)
Oxford	3452	341	10	3111	3.14	84 (20)	80 (30)	44 (25)	91 (14)	100 (25)	71 (20)
Pharmaceutical Medicine Virtual	228	27	12	201	0.2	88 (20)	90 (20)	N/A	N/A	100 (25)	78 (25)
Severn	4014	308	8	3706	3.74	84 (24)	80 (30)	44 (27)	91 (11)	100 (25)	71 (18)
South West Peninsula	2847	296	10	2551	2.57	84 (20)	80 (20)	44 (25)	94 (10)	100 (25)	73 (20)
Wales	4634	313	7	4321	4.36	84 (20)	80 (20)	50 (25)	91 (14)	100 (25)	73 (16)
Wessex	3981	294	7	3687	3.72	84 (20)	80 (20)	44 (27)	91 (10)	100 (25)	71 (19)
Yorkshire and the Humber Postgraduate	9123	392	4	8731	8.81	84 (20)	80 (20)	50 (29)	91 (11)	100 (25)	70 (20)
Overall	105,549	6473	6	99,076	100	84 (20)	80 (30)	50 (27)	91 (11)	100 (25)	71 (19)

NTS: National Trainee Survey; IQR: Interquartile range; BME: black and minority ethnic; EEA: European Economic Area.

measures were 'overall satisfaction', 'adequate experience', 'workload', 'clinical supervision', 'educational supervision', and 'access to educational resources'.

Survey respondents must answer at least one fewer than the maximum number of questions that contribute to any given indicator to have a valid score; for indicators that have only two questions, respondents need a valid response for both questions. Due to differences in the nature of training in particular specialties and deaneries, no clinical supervision and workload scores were obtained for the 201 trainees in the Pharmaceutical Medicine Virtual Deanery. Missing data in the results released by the General Medical Council as a result of these issues were excluded from analysis: 'workload' (201, 0.2%), 'clinical supervision' (429 responses, 0.43%), 'educational supervision' (86 responses, 0.09%), and 'access to educational resources' (3161 responses; 3.19%).

Statistical analysis was undertaken using Stata 14 (StataCorp LP). Medians and interquartile ranges are used to display the (non-parametrically distributed) responses by participant category. The survey design function of Stata (*svyset*) was used to create a one-stage clustered design with stratification model, thus accounting for any reduced variance in reported experience within deaneries (clusters) and specialties (strata). Ordered logistic regression models were used to explore the adjusted association between trainee factors and the different subjective experience measures (dependent ordered categorical variables), with the largest category within each trainee factor variable used as the base level (highlighted in bold below). Coefficients and confidence intervals (CIs) are used as indicators of effect size; p values with a cut off of <0.001 are used as indicators of statistical significance (a Bonferroni correction is applied for multiple testing).

Trainee factors modelled as independent categorical variables were the year of survey (2014 or **2015**), trainee self-declared gender (male or **female**), ethnicity (**white**, black and minority ethnic or unspecified), country of primary medical qualification (**Britain**, European Economic Area or other country), training grade (Foundation Year, **Core/lower** or ST4+), post specialty (Anaesthetics, Emergency Medicine, General Practice, **Medicine**, Obstetrics and Gynaecology, Occupational Medicine, Ophthalmology, Paediatrics and Child Health, Pathology, Psychiatry, Public Health, Radiology or Surgery) and deanery (Defence Postgraduate Medical, East Midlands Healthcare Workforce, East of England Multi-Professional, Kent, Surrey and Sussex, **London**, Mersey, NHS Education for Scotland East Region, NHS Education for Scotland North Region, NHS Education for Scotland South-East, NHS Education for Scotland West Region, NHS West Midlands Workforce, North Western, Northern, Northern Ireland Medical & Dental, Oxford, Pharmaceutical Medicine Virtual, Severn, South West Peninsula, Wales, Wessex and Yorkshire and the Humber Postgraduate).

Results

A total of 99,076 responses were analysed. Table 1 shows a summary of responses for each of the trainee factors considered. The results of the regression models for each of the six outcome variables are summarised in Tables 2 to 5 and Supplementary Tables 1 and 2, and include coefficients and confidence intervals (CIs) as indicators of effect size, and p-values as indicators of statistical significance for the adjusted associations.

From 2014 to 2015, there was a statistically significant improvement in all considered outcome measures except educational supervision, which showed a non-statistically significant decline. Men reported superior subjective experience than women, reaching statistical significance for all six outcome measures.

Unspecified ethnicities reported worse experience in all measures compared to whites. Ethnic minorities reported worse experience in all measures compared to whites, except educational supervision and workload, where they reported better experience, though only reaching statistical significance for the former.

Medical graduates from the European Economic Area did not report a statistically significant difference in any of the six outcomes measures when compared to British graduates. As compared to British graduates, though those receiving their degrees from other countries (outside the European Economic Area) reported worse overall satisfaction, they experienced the workload, clinical supervision and access to educational resources favourably; differences in the other outcome measures did not reach statistical significance.

As compared to core and lower grade trainees, foundation year doctors reported worse overall satisfaction, workload, clinical supervision, and access to educational resources. As compared to core and lower grade trainees, ST4+ trainees reported superior overall satisfaction, adequate experience, clinical supervision and access to educational resources; they reported worse educational supervision, however.

There was marked variation in the experience of trainees across the various deaneries and specialties through the different measures.

The described associations only explain a small component of the heterogeneity in reported experiences, with no coefficient within any of the models having magnitude greater than 3 points (Tables 2 to 5, Supplementary Tables 1 and 2).

Table 2. Results of the regression model for overall satisfaction.

Overall satisfaction	Coef.	*P*	(95% Conf.	interval)
NTS year				
2014	−0.05011	0	−0.076247	−0.023974
Sex				
Man	0.1547898	0	0.1244366	0.1851429
Ethnicity				
BME	−0.091892	0	−0.124981	−0.058802
Unspecified	−0.56095	0	−0.621865	−0.500034
Country of qualification				
EEA	−0.051058	0.37	−0.16291	0.0607938
Other country	−0.136681	0	−0.188552	−0.08481
Grade				
Foundation	−0.138621	0	−0.223142	−0.0541
Higher ST4+	0.4839267	0	0.4077083	0.5601452
Deanery				
Defence Postgraduate Medical Deanery	0.0526884	0.76	−0.284799	0.3901759
East Midlands Healthcare Workforce Deanery	−0.141982	0	−0.225591	−0.058372
East of England Multi-Professional Deanery	−0.072735	0.25	−0.197109	0.0516387
Kent, Surrey and Sussex Deanery	−0.0447	0.45	−0.161952	0.0725525
Mersey Deanery	0.0781565	0.05	0.0017082	0.1546047
NHS Education for Scotland (East Region)	0.1140671	0.22	−0.067315	0.2954489
NHS Education for Scotland (North Region)	0.0948012	0.4	−0.126998	0.3166002
NHS Education for Scotland (South-East Region)	0.2327519	0	0.1286861	0.3368176
NHS Education for Scotland (West Region)	0.0688916	0.47	−0.119245	0.2570284
NHS West Midlands Workforce Deanery	−0.006241	0.93	−0.138277	0.1257948
North Western Deanery	−0.015313	0.8	−0.136789	0.1061635
Northern Deanery	0.2694034	0	0.1927797	0.3460272

(continued)

Table 2. Continued.

Overall satisfaction	Coef.	*P*	(95% Conf.	interval)
Northern Ireland Medical & Dental Training Agency	0.1685889	0	0.0617164	0.2754615
Oxford Deanery	−0.00947	0.92	−0.189603	0.1706643
Pharmaceutical Medicine Virtual Deanery	0.4002007	0	0.2949145	0.5054868
Severn Deanery	0.0376144	0.46	−0.063242	0.1384705
South West Peninsula Deanery	0.2266669	0	0.0887978	0.364536
Wales Deanery	0.1571742	0.01	0.0328225	0.2815259
Wessex Deanery	0.1354758	0.13	−0.041071	0.3120225
Yorkshire and the Humber Postgraduate Deanery	−0.016205	0.75	−0.114262	0.0818512
Specialty				
Anaesthetics Posts	0.7330749	0	0.6021196	0.8640302
Emergency Medicine Posts	0.4638225	0	0.3554997	0.5721454
General Practice Posts	1.495513	0	1.382964	1.608062
Obstetrics and Gynaecology Posts	−0.072557	0.12	−0.164628	0.0195138
Occupational Medicine Posts	−0.284283	0.63	−1.453688	0.8851223
Ophthalmology Posts	0.7622742	0	0.6058899	0.9186584
Paediatrics and Child Health Posts	0.357096	0	0.2637479	0.4504441
Pathology Posts	0.7489165	0	0.6211184	0.8767147
Psychiatry Posts	0.5516597	0	0.4726449	0.6306744
Public Health Posts	0.617092	0	0.3372051	0.8969789
Radiology Posts	0.5624192	0	0.4097674	0.7150709
Surgery Posts	−0.130944	0	−0.210909	−0.050979

NTS: National Trainee Survey; EEA: European Economic Area; BME: black and minority ethnic.

Discussion

Principal findings

Despite the use of a stringent Bonferroni correction for multiple testing, this work suggests that self-reported experiences amongst UK medical trainees in the indicators 'overall satisfaction', 'adequate experience', 'workload', 'clinical supervision', 'educational supervision', and 'access to educational resources' are related to gender, ethnicity, country of primary medical qualification, grade, deanery and post specialty. Although there were various statistically significant associations, these only related to small changes in the observed responses, with no single trainee factor associated with a more than a 3 point change in any of the considered outcome measures (Tables 2 to 5, Supplementary Tables 1 and 2). Thus, while the considered aspects are indeed

Table 3. Results of the regression model for adequate experience.

Adequate experience	Coef.	*P*	(95% Conf.	interval)
NTS year				
2014	−0.0826676	0	−0.1080057	−0.0573295
Sex				
Man	0.188458	0	0.158784	0.218132
Ethnicity				
BME	−0.1875599	0	−0.219178	−0.1559417
Unspecified	−0.597724	0	−0.6677686	−0.5276795
Country of qualification				
EEA	−0.0638932	0.267	−0.1770658	0.0492793
Other country	−0.0011677	0.964	−0.0524673	0.0501319
Grade				
Foundation	0.0923636	0.027	0.0105416	0.1741856
Higher ST4+	0.5567546	0	0.4782069	0.6353024
Deanery				
Defence Postgraduate Medical Deanery	0.0423144	0.796	−0.2797009	0.3643297
East Midlands Healthcare Workforce Deanery	−0.119388	0.01	−0.2093368	−0.0294393
East of England Multi-Professional Deanery	−0.0260942	0.707	−0.1628351	0.1106468
Kent, Surrey and Sussex Deanery	−0.0251582	0.568	−0.1118315	0.0615152
Mersey Deanery	0.0500133	0.182	−0.0235271	0.1235537
NHS Education for Scotland (East Region)	0.0336902	0.758	−0.1819208	0.2493011
NHS Education for Scotland (North Region)	0.1954306	0.083	−0.0259812	0.4168423
NHS Education for Scotland (South-East Region)	0.2168774	0	0.1181342	0.3156206
NHS Education for Scotland (West Region)	0.0745986	0.267	−0.0576219	0.206819
NHS West Midlands Workforce Deanery	−0.0164852	0.773	−0.1291486	0.0961782
North Western Deanery	0.0330282	0.587	−0.0866814	0.1527378
Northern Deanery	0.2248745	0	0.1345954	0.3151536

(continued)

Table 3. Continued.

Adequate experience	Coef.	*P*	(95% Conf.	interval)
Northern Ireland Medical & Dental Training Agency	0.0642345	0.326	−0.0642494	0.1927183
Oxford Deanery	0.0040308	0.955	−0.1374755	0.1455371
Pharmaceutical Medicine Virtual Deanery	0.7771865	0	0.6882555	0.8661174
Severn Deanery	0.045151	0.317	−0.0435608	0.1338629
South West Peninsula Deanery	0.2087045	0.007	0.0586035	0.3588055
Wales Deanery	0.1187457	0.016	0.021979	0.2155124
Wessex Deanery	0.1156285	0.131	−0.0345669	0.2658239
Yorkshire and the Humber Postgraduate Deanery	−0.0001981	0.996	−0.0772824	0.0768863
Specialty				
Anaesthetics Posts	0.933289	0	0.8341783	1.0324
Emergency Medicine Posts	0.7096084	0	0.579502	0.8397148
General Practice Posts	1.328737	0	1.239339	1.418136
Obstetrics and Gynaecology Posts	0.0467853	0.281	−0.0386205	0.1321911
Occupational Medicine Posts	0.2440507	0.62	−0.7233155	1.211417
Ophthalmology Posts	0.6971023	0	0.5327681	0.8614364
Paediatrics and Child Health Posts	0.3191126	0	0.249628	0.3885973
Pathology Posts	0.5810943	0	0.437272	0.7249167
Psychiatry Posts	0.4924271	0	0.3647447	0.6201096
Public Health Posts	0.7100714	0	0.403389	1.016754
Radiology Posts	0.4205957	0	0.2858815	0.5553099
Surgery Posts	0.0383929	0.215	−0.0224749	0.0992608

NTS: National Trainee Survey; EEA: European Economic Area; BME: black and minority ethnic.

associated with self-reported experience, they explain only a small component of the overall variation.

Limitations

These data have been anonymised by the General Medical Council by replacing respondent identifiers and removing responses from doctors in training where there are fewer than 3 respondents sharing the same demographic characteristics. After removing data to preserve participant anonymity, there were 64,278 participants providing 99,076 responses. Thus, a significant proportion of trainees will have completed the General Medical Council National Trainee Survey in both 2014 and 2015, in turn potentially impacting on the independence of the responses seen. Furthermore, a total of 6473 out of 105,549 (6.1%) cases were removed (Table 1). Though the

Table 4. Results of the regression model for workload.

Workload	Coef.	*P*	(95% Conf.	interval)
NTS year				
2014	−0.123785	0	−0.147871	−0.099699
Sex				
Man	0.0729118	0	0.0384929	0.1073308
Ethnicity				
BME	0.0240264	0.18	−0.011113	0.0591657
Unspecified	−0.305534	0	−0.376991	−0.234078
Country of qualification				
EEA	−0.120932	0.04	−0.236183	−0.00568
Other country	0.1655146	0	0.1112163	0.219813
Grade				
Foundation	−0.192291	0	−0.277091	−0.107491
Higher ST4+	0.0993959	0.01	0.026267	0.1725248
Deanery				
Defence Postgraduate Medical Deanery	0.1115573	0.38	−0.138446	0.3615601
East Midlands Healthcare Workforce Deanery	0.1617226	0.06	−0.007299	0.3307438
East of England Multi-Professional Deanery	0.0301829	0.75	−0.155003	0.2153685
Kent, Surrey and Sussex Deanery	0.0378941	0.78	−0.225609	0.3013977
Mersey Deanery	0.2519565	0	0.0871542	0.4167589
NHS Education for Scotland (East Region)	0.3470021	0.01	0.0838783	0.6101258
NHS Education for Scotland (North Region)	0.3713105	0.02	0.0490519	0.693569
NHS Education for Scotland (South-East Region)	0.3418963	0	0.1252514	0.5585412
NHS Education for Scotland (West Region)	0.298131	0.01	0.0890429	0.5072192
NHS West Midlands Workforce Deanery	0.4301412	0	0.2616436	0.5986387
North Western Deanery	0.320573	0	0.1657998	0.4753462
Northern Deanery	0.319863	0	0.1304559	0.5092701

(continued)

Table 4. Continued.

Workload	Coef.	*P*	(95% Conf.	interval)
Northern Ireland Medical & Dental Training Agency	0.2517991	0.02	0.0348412	0.4687569
Oxford Deanery	−0.035613	0.73	−0.239436	0.1682098
Severn Deanery	0.2078641	0.04	0.0117077	0.4040204
South West Peninsula Deanery	0.1836349	0.09	−0.029851	0.3971208
Wales Deanery	0.427265	0	0.2574042	0.5971257
Wessex Deanery	0.2075148	0.01	0.0434657	0.3715639
Yorkshire and the Humber Postgraduate Deanery	0.2400331	0.02	0.0370278	0.4430383
Specialty				
Anaesthetics Posts	1.14019	0	1.023263	1.257118
Emergency Medicine Posts	−0.527802	0	−0.642702	−0.412903
General Practice Posts	1.974929	0	1.86594	2.083918
Obstetrics and Gynaecology Posts	0.5618605	0	0.3721124	0.7516086
Occupational Medicine Posts	1.881576	0	1.559858	2.203293
Ophthalmology Posts	1.022056	0	0.7905606	1.253551
Paediatrics and Child Health Posts	0.4098094	0	0.2651561	0.5544627
Pathology Posts	1.994993	0	1.745653	2.244332
Psychiatry Posts	1.726099	0	1.498277	1.953921
Public Health Posts	2.937548	0	2.586935	3.288162
Radiology Posts	1.428318	0	1.155673	1.700962
Surgery Posts	0.294615	0	0.1591027	0.4301272

NTS: National Trainee Survey; EEA: European Economic Area; BME: black and minority ethnic.

overall proportion of removed responses was low, there is marked variation in how much data were lost from the different categories (Table 1), with more than 20% of responses missing from the unspecified ethnicities (33%), European Economic Area graduates (46%), Occupational Medicine trainees (38%), Ophthalmology trainees (38%), Pathology trainees (34%), Public health trainees (46%), NHS Education for Scotland East Region trainees (24%) and NHS Education for Scotland North Region trainees (21%) categories. The removal of responses was not a random process, and had greatest effect on trainees in minority groups. However, the available sample was still sufficient to detect differences within many of the considered trainee factors and experience measures. Insufficient response to survey questions also meant that data were missing for three of the outcome measures considered, though this was smaller in magnitude and less likely to have affected the results: 'clinical supervision' (228 responses, 0.23%), 'educational supervision' (86 responses, 0.09%), and 'access to educational resources' (3,161 responses; 3.19%).

Table 5. Results of the regression model for clinical supervision.

Clinical supervision	Coef.	*P*	(95% Conf.	interval)
NTS year				
2014	−0.0440857	0.001	−0.0704952	−0.0176763
Sex				
Man	0.2035731	0	0.1754534	0.2316927
Ethnicity				
BME	−0.077912	0	−0.112883	−0.0429409
Unspecified	−0.3849404	0	−0.4382449	−0.3316359
Country of qualification				
EEA	0.0833852	0.076	−0.0086804	0.1754508
Other country	0.1789638	0	0.1269863	0.2309412
Grade				
Foundation	−0.5709445	0	−0.646233	−0.495656
Higher ST4+	0.717028	0	0.6577828	0.7762731
Deanery				
Defence Postgraduate Medical Deanery	0.0729838	0.43	−0.1089335	0.2549011
East Midlands Healthcare Workforce Deanery	−0.1574565	0.048	−0.3137699	−0.0011432
East of England Multi-Professional Deanery	−0.0336628	0.704	−0.2081328	0.1408072
Kent, Surrey and Sussex Deanery	−0.0186136	0.804	−0.1662333	0.1290062
Mersey Deanery	0.0045809	0.947	−0.1320214	0.1411832
NHS Education for Scotland (East Region)	−0.0332169	0.737	−0.2281293	0.1616955
NHS Education for Scotland (North Region)	0.021227	0.825	−0.1681351	0.2105891
NHS Education for Scotland (South-East Region)	0.14045	0.082	−0.0180042	0.2989043
NHS Education for Scotland (West Region)	0.0379719	0.807	−0.2678185	0.3437624
NHS West Midlands Workforce Deanery	0.0894896	0.211	−0.0510754	0.2300546
North Western Deanery	−0.086625	0.271	−0.2412696	0.0680196
Northern Deanery	0.3940991	0	0.2607138	0.5274844
Northern Ireland Medical & Dental Training Agency	0.3068588	0	0.1553816	0.458336
Oxford Deanery	−0.035232	0.685	−0.2064454	0.1359814
Severn Deanery	0.0086333	0.9	−0.1271749	0.1444415
South West Peninsula Deanery	0.2378881	0.025	0.0306404	0.4451358
Wales Deanery	−0.0627973	0.416	−0.2146185	0.0890239

(continued)

Table 5. Continued.

Clinical supervision	Coef.	*P*	(95% Conf.	interval)
Wessex Deanery	0.0777715	0.346	−0.0845245	0.2400675
Yorkshire and the Humber Postgraduate Deanery	−0.0368444	0.596	−0.1736963	0.1000075
Specialty				
Anaesthetics Posts	0.6093095	0	0.4933132	0.7253057
Emergency Medicine Posts	−0.0190031	0.792	−0.1609679	0.1229616
General Practice Posts	1.025555	0	0.9157396	1.135371
Obstetrics and Gynaecology Posts	−0.1976587	0	−0.3048599	−0.0904575
Occupational Medicine Posts	−0.7799197	0.311	−2.295091	0.7352521
Ophthalmology Posts	0.3874072	0.001	0.1678983	0.6069161
Paediatrics and Child Health Posts	0.3073307	0	0.1940871	0.4205743
Pathology Posts	0.7915133	0	0.6078734	0.9751532
Psychiatry Posts	0.4438941	0	0.3244746	0.5633136
Public Health Posts	0.4352268	0.015	0.0869019	0.7835517
Radiology Posts	0.3642086	0	0.1712133	0.5572038
Surgery Posts	0.0306072	0.57	−0.0753556	0.1365701

NTS: National Trainee Survey; EEA: European Economic Area; BME: black and minority ethnic.

Relation to other studies

This is the largest published analysis of survey responses to compare the subjective experience of medical trainees to demographic factors. While these findings are consistent with previous work,[1–8,10,11,14,17–22] the numerical scores used also allow for quantitative comparisons to be made between the different trainee factors and outcome measures.[24] Furthermore, the General Medical Council National Trainee Survey is an annual survey, allowing the associations and differences between groups to be monitored yearly, and related to interventions targeting disparity. Work analysing the responses of the trainee survey in 2006 clearly highlighted that there were differences in the satisfaction and supervision of trainees in different specialty groups, but was not able to compare particular subsets of groups, and did not attempt to investigate the acknowledged effects of sex, year of qualification, time in post, and grade.[23] This work differed in its methodological approach as compared to the current study; with a sample size of 23,267 it used in a multilevel model considering deaneries, training providers and specialty groups.[23] Though adjustments were made for specialty group, training grade, time in post, sex, year of qualification, and the route used to respond to the questionnaire, ethnicity and country of primary medical qualification were not considered.[23] The use of a multi-level model potentially offered superior statistical robustness, but may have also hindered in its complexity, with adjustment for the year of qualification not possible when considering supervision scores due to an inability to converge the model, and the repeated division of the cohort within clusters potentially limiting the ability to identify significant differences between groups.[23]

Implications and further work

As is a limitation with all such observational studies, this work only identifies associations, but does not explore the underlying mechanisms. To this end, while it is demonstrated here that trainee factors are associated with subjective experience across different indicators, further work is required to explore the reasons behind this, and how this relates to trainee quality of life, work performance and career progression. Given the demographic diversity of the medical workforce in the UK,[1–3] and the recognised variation in performance across trainees of different gender,[4,5] ethnicity,[5–9] and country of primary medical

qualification,[3,10,11] it may be particularly prudent to explore how discrepancies in the experiences of these groups might affect their outcomes.

Declarations

Competing interests: The General Medical Council has provided DG with the data to support the submitted work; DG is a medical trainee and as such has a relationship with the General Medical Council that might have an interest in the submitted work in the previous 3 years; DG has no non-financial interests that may be relevant to the submitted work, other than those highlighted above.

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Ethical approval: Not required; the research application was reviewed by the GMC and released data were anonymised.

Guarantor: DG had full access to all of the data (including statistical reports and tables) in the study and can take responsibility for the integrity of the data and the accuracy of the data analysis.

Contributorship: Sole authorship

Acknowledgements: This research has been undertaken using data from the National Training Survey (NTS) data set available on application from the GMC. The GMC does not however hold any responsibility for subsequent analysis done from raw data provided as this is seen as creating new information. The GMC offered clarification on missing data and calculation of indicator scores. The final draft was also approved by the GMC.

Provenance: Not commissioned; peer-reviewed by Jeremy Brown

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