

IN BRIEF

- The socio-demographic characteristics of successful and unsuccessful applicants to the former UMDS over a five-year period were compared.
- The effect of socio-demographic characteristics was small though significant. The strongest effect was a tendency for female applicants to be more successful than males.
- A prospective study of applications across a number of dental schools and including measures of both predicted and actual academic performance, as well as socio-demographic characteristics is recommended.

Admission as a dental student to the former UMDS and its relationship to socio-demographic characteristics

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Objectives To describe the socio-demographic characteristics of successful and unsuccessful applicants to one UK dental school over a period of five years. To compare the characteristics of successful and unsuccessful candidates.

Design Retrospective analysis of admissions data for the former United Medical and Dental Schools of Guy's and St Thomas' (UMDS) dental school provided by Universities and Colleges Admissions Service (UCAS) for a five year period (1994-1998).

Participants Applicants to the former UMDS dental school between 1994 and 1998.

Main outcome measures Success of candidates at four stages of the application process: initial application; offer made by the dental school; offer accepted or declined by the candidate; candidate accepted by the school (post A level results). Comparisons were made of the success rates among candidates grouped according to socio-demographic characteristics at each transition between these stages. A level performance was not included in the analysis, which must limit the findings, and may explain some of the variation found in the study.

Results The effect of socio-demographic characteristics on the admissions process was small though significant. Approximately 9% of initial applicants reached the final stage and were accepted into the dental school. The most marked effect was a bias towards female entrants (11.5% of women applicants were accepted, compared with 7% of men). Only 5% of applicants from all the Black minority groups were successful. In comparison 17% of applicants of Chinese origin were successful. The proportion of accepted applicants from London and the South East (12%) was greater than from other areas (9%).

Conclusions Any conclusions must be tempered by the limitations of the study: the retrospective nature of the study together with the lack of information on A level results. Given these caveats, this study has demonstrated that the success of applicants to one former dental school was related to their socio-demographic characteristics. A prospective study including a number of dental schools in the UK which records both predicted and achieved A level grades would provide more definitive information on the impact of socio-demographic factors on admission to dental school.

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INTRODUCTION

Competition for entry to United Kingdom dental schools is intense. Applications each year exceed 8,000 for around 800 places and it is of paramount importance that admissions procedures are fair and select those candidates who will make the best dentists. Four recent studies have focused on the characteristics of those finally admitted to UK dental schools. Duguid and Drummond¹ analysed admissions to all UK dental schools over the period 1983 to 1998. The number of applicants to UK dental schools remained reasonably constant

over this time, though the proportion of overseas students increased more than threefold. In addition there was a rise in the proportion of mature home students admitted, and in the proportion of female students. In contrast to applicants to medicine, applicants to dental school were more likely to be male, to come from minority ethnic communities and to be from lower social groups.^{2,3} Hoad-Reddick & MacFarlane⁴ described the applicants to the Turner Dental School, University of Manchester. Socio-demographic characteristics were related to performance at interview, A level

results and, for successful candidates, performance in the first year of the dental course. Interviewers' ratings of the candidates' suitability to study dentistry were positively correlated with the personality variables 'Authority' and 'Conscientiousness'. There was no relationship between personality and performance in the first year of the dental course.^{5,6}

These studies have not addressed differences in characteristics that could affect the process of admission. This has been examined in the medical literature; recent studies of applications to medical schools have revealed that the likelihood of successful entry is lower among applicants from minority ethnic groups than among White applicants.^{7,8} It is believed that this disadvantage occurs at the initial stage of the admissions procedure – between application and the offering of a place by the university.⁹

The authors know of no similar study in dentistry that has examined the comparative success of applicants from different social groups. The present study seeks to describe the socio-demographic characteristics of successful and unsuccessful applicants to one UK dental school over a period of five years and to identify predictors of success at each stage of the application process, including the degree to which success is predicted by ethnicity, gender and the type of school attended by the applicant.

METHOD

Data

Data for all students seeking admission to the former UMDS dental school were provided by the Universities and Colleges Admissions Service (UCAS). The data were analysed retrospectively. For each applicant the following socio-demographic information was available:

- Year of application.
- Gender.
- Self-identified ethnicity.
- Area of residence (defined by Government office region).
- Presence or absence of disabilities.
- School type.

In addition information was available on the outcome of the application:

- Whether an offer was made to the applicant.
- Whether the applicant took up a firm or insurance offer with the school.
- Whether the applicant was accepted for entry.

Data analysis

The initial analysis sought to describe the characteristics of applicants at four points in the application process: initial application; offer made by the dental school; offer

accepted or declined by the candidate; candidate accepted by the school (post A level results).

Univariate analyses compared the socio-demographic characteristics of candidates who were successful and those who were unsuccessful at each transition point: initial application to offer by school; offer by school to acceptance or decline by candidate; acceptance by candidate to acceptance by school. Logistic regression analyses were then carried out in order to determine the extent to which success at each transition point was related to socio-demographic variables. Three regression analyses were performed using success at each of the three transition points as the dependent variables. The predictor variables were entered as a single block, and comprised the following

- Sex (male versus female).
- Age (18 or younger versus 19 or older).
- Ethnicity (nine ethnic groups were identified as described by the OPCS categorisation with the exception that the group Black other was included with the other category).
- Disability (any disability versus none).
- School type (independent versus other).

FINDINGS

Characteristics of applicants

The socio-demographic characteristics of applicant cohorts over the five year period for all applicants at the first stage of the admissions process are shown in Table 1. The proportion of female applicants remained fairly constant over the five year period. There were declines in the proportion of applicants aged over 18, and the proportion of applicants of White ethnic origin. The decline in the proportion of applicants of White ethnic origin was accompanied by an almost parallel increase in the proportion of applicants of Indian origin. The majority of applicants originated from the Greater London area and the South East of England. There were no identifiable trends over the five years in the proportion of candidates with disabilities, or in the type of school attended by applicants.

Information on the characteristics of participants across the four stages of the application and summarised across all five years is given in Table 2. Over the period studied the number of students accepted to study dentistry at the former UMDS ranged from 82 to 101. Approximately 9% of initial applicants reached the final stage and were accepted into the dental school. Women were more successful applicants than men (11.5% of women applicants were accepted, compared with 7% of men). Similarly there were different rates of successful application amongst individuals

from different ethnic groups. Only 5% of applicants from all the Black minority groups were successful. In comparison 17% of applicants of Chinese origin were successful. The proportion of accepted applicants from London and the South East (12%) was greater than that from other areas (9%). Only 2.5% of overseas applicants (both EU and non-EU) gained acceptance to study dentistry at UMDS. Finally, the proportion of successful applicants with disabilities remained roughly similar to the proportion of initial applicants who identify themselves as having a disability. However the only disabilities which remained amongst successful applicants were dyslexia and 'unseen' disabilities.

The results of univariate comparisons are summarised in Table 3. At the first transition point (initial application to offer made by university), there were significant differences for comparisons of age, gender, ethnicity, region and school type. Those applicants who were younger, female, living in London or the South East of England, and who attended independent schools were most likely to be made an offer. Applicants who identified themselves as being of a Black ethnic group were less likely than applicants of all other ethnic groups to be successful at this stage. For the second transition point only ethnicity and region were significantly different. Applicants who were from London or the South East, and who identified themselves as White were more likely to take up the offer. Finally comparisons of applicants who were accepted into UMDS revealed significant differences in age, ethnicity and region. Those individuals who were older and White were less successful in the final stage of the application process. There was an increase in the proportion of candidates from the Eastern region amongst those finally accepted into the dental school.

The logistic regression predicting which applicants were successful in obtaining the offer of a place to study dentistry is shown in Table 4. The model reveals that success at this initial stage of the application process was related to gender of applicant (female applicants were more successful), age (younger applicants were more successful), ethnicity (in particular White applicants were more likely to be successful, while applicants of Pakistani origin were less successful) and school type (applicants from independent schools were more successful).

The analysis predicting which candidates took up the offer either as a firm acceptance or insurance acceptance is given in Table 5. Only ethnicity was a significant predictor, White candidates were more likely to take up the offer of a place to study at the former UMDS.

Table 1 Characteristics of all applicants to the former UMDS dental school 1994–1998, shown by year of application.

Variable	1994 (n=815)	1995 (n=986)	1996 (n=948)	1997 (n=1098)	1998 (n=994)
Gender					
Female	368 (45.2%)	463 (47.0%)	425 (44.8%)	511 (46.5%)	466 (46.9%)
Male	457 (54.8%)	523 (53.0%)	523 (55.2%)	587 (53.5%)	528 (53.1%)
Age					
18 and under	348 (42.7%)	491 (49.8%)	448 (47.3%)	581 (52.9%)	553 (55.6%)
25 and under	765 (93.9%)	935 (94.8%)	895 (94.4%)	1059 (96.4%)	955 (96.1%)
Ethnicity					
White	237 (29.1%)	244 (24.7%)	213 (22.5%)	274 (25.0%)	225 (22.6%)
Black Caribbean	7 (0.9%)	6 (0.6%)	11 (1.2%)	8 (0.7%)	4 (0.4%)
Black African	19 (2.3%)	21 (2.1%)	21 (2.2%)	19 (1.7%)	29 (2.9%)
Black Other	3 (0.4%)	3 (0.3%)	3 (0.3%)	3 (0.3%)	3 (0.3%)
Indian	201 (24.7%)	304 (30.8%)	296 (31.2%)	331 (30.1%)	331 (33.3%)
Pakistani	84 (10.3%)	100 (10.1%)	108 (11.4%)	124 (11.3%)	89 (9.0%)
Bangladeshi	9 (1.1%)	23 (2.3%)	21 (2.2%)	25 (2.3%)	18 (1.8%)
Chinese	12 (1.5%)	14 (1.4%)	14 (1.5%)	16 (1.5%)	14 (1.4%)
Other Asian	82 (10.1%)	103 (10.4%)	8 (8.4%)	104 (9.5%)	87 (8.8%)
Other	42 (5.2%)	45 (4.6%)	49 (5.2%)	48 (4.4%)	52 (5.2%)
Unknown	119 (14.6%)	123 (12.5%)	132 (13.9%)	146 (13.3%)	142 (14.3%)
Government office region					
North East	7 (0.9%)	11 (1.1%)	11 (1.2%)	20 (1.8%)	17 (1.7%)
Yorkshire & The Humber	21 (2.6%)	29 (2.9%)	29 (3.2%)	49 (4.5%)	27 (2.7%)
North West	40 (4.9%)	32 (3.2%)	35 (3.7%)	49 (4.5%)	37 (3.7%)
Merseyside	10 (1.2%)	9 (0.9%)	9 (0.9%)	22 (2.0%)	12 (1.2%)
East Midlands	25 (3.1%)	32 (3.2%)	36 (3.8%)	45 (4.1%)	42 (4.2%)
West Midlands	63 (7.7%)	95 (9.6%)	72 (7.6%)	102 (9.3%)	84 (8.5%)
Eastern	56 (6.9%)	79 (8.0%)	75 (7.9%)	72 (6.6%)	59 (5.9%)
Greater London	326 (40.0%)	407 (41.3%)	397 (41.9%)	424 (38.6%)	426 (42.9%)
South East	97 (11.9%)	111 (11.3%)	126 (13.3%)	119 (10.8%)	106 (10.7%)
South West	27 (3.3%)	35 (3.5%)	23 (2.4%)	34 (3.1%)	26 (2.6%)
Wales	23 (2.8%)	32 (3.2%)	21 (2.2%)	43 (3.9%)	29 (2.9%)
Northern Ireland	13 (1.6%)	10 (1.0%)	7 (0.7%)	10 (0.9%)	11 (1.1%)
Scotland	10 (1.2%)	6 (0.6%)	3 (0.3%)	3 (0.3%)	6 (0.6%)
Other EU	22 (2.7%)	31 (3.1%)	23 (2.4%)	29 (2.6%)	37 (3.7%)
Other overseas	75 (9.2%)	67 (6.8%)	80 (8.4%)	77 (7.0%)	71 (7.1%)
Miscellaneous	0	0	0	0	4 (0.4%)
Disabilities					
Blind/Partially sighted	0	1 (0.1%)	1 (0.1%)	0	0
Deaf/Hearing impaired	0	1 (0.1%)	1 (0.1%)	1 (0.1%)	0
Dyslexia	3 (0.4%)	4 (0.4%)	3 (0.3%)	6 (0.6%)	4 (0.4%)
Multiple disabilities	0	0	0	6 (0.6%)	1 (0.1%)
None	798 (97.9%)	967 (97.1%)	932 (98.3%)	1076 (98.0%)	966 (97.2%)
Other	1 (0.1%)	0	0	1 (0.1%)	1 (0.1%)
Unseen disability	12 (1.5%)	13 (1.3%)	11 (1.2%)	14 (1.3%)	22 (2.2%)
Wheelchair/mobility difficulties	1 (0.1%)	0	0	0	0

The analysis predicting which candidates took up a place at dental school is summarised in Table 6. This included the predictor variables of the reply made by the student to the offer from the dental school (either firm or insurance), and whether the applicant achieved the required number of A level points or equivalent. Final acceptance at dental school was predicted by age, reply to

offer, and A level points. Younger applicants were more likely to be accepted to the dental school, as were applicants who had replied with a firm acceptance of the offer, and those who achieved the required A level grades. Over the five years studied only 43 of the 448 students (9.5%) accepted to study dentistry at the former UMDS had a shortfall in their A level grades.

DISCUSSION

There are several limitations of the present study which must be explored in interpreting the findings described. The study is retrospective and limited in the data that are available. In particular the predicted A level grades for applicants were not available. These are likely to exert a strong influence on the application at all transition points, and in particular whether an

Table 2 Socio-demographic characteristics of applicants at each stage of the admissions procedure. Data are summarised over five years of applications.

	All applicants			Applicants who were offered a conditional or unconditional place		Applicants who returned firm or Insurance confirmations		Accepted applicants	
	Number	Number	% of total	Number	% of total	Number	% of total	Number	% of total
Total	4,841	1,383	28.6%	1,098	22.7%	450	9.3%		
Gender									
Female	2,233	776	34.8%	625	28.0%	257	11.5%		
Male	2,608	607	23.3%	473	18.1%	193	7.4%		
Age									
18 and under	2,420	919	38.0%	717	29.6%	257	10.6%		
25 and under	4,609	1,350	29.3%	1,072	23.3%	435	9.4%		
Ethnicity									
White	1,193	562	47.1%	414	34.7%	144	12.1%		
Black Caribbean	36	11	30.6%	9	25.0%	3	8.3%		
Black African	109	19	17.4%	16	14.7%	5	4.6%		
Black Other	15	1	6.7%	0	0.0%	0	0.0%		
Indian	1,463	433	29.6%	348	23.8%	148	10.1%		
Pakistani	505	85	16.8%	71	14.1%	37	7.3%		
Bangladeshi	96	21	21.9%	16	16.7%	4	4.2%		
Chinese	70	20	28.6%	17	24.3%	12	17.1%		
Other Asian	456	91	20.0%	84	18.4%	44	9.6%		
Other	236	68	28.8%	58	24.6%	22	9.3%		
Government office region									
North East	66	20	30.3%	14	21.2%	3	4.5%		
Yorkshire and Humberside	156	43	27.6%	32	20.5%	10	6.4%		
North West	193	61	31.6%	46	23.8%	11	5.7%		
Merseyside	62	20	32.3%	14	22.6%	6	9.7%		
East Midlands	180	63	35.0%	51	28.3%	20	11.1%		
West Midlands	416	123	26.6%	83	20.0%	26	6.3%		
Eastern	341	128	37.5%	100	29.3%	37	10.9%		
Greater London	1980	540	27.3%	457	23.1%	217	11.0%		
South East	559	235	42.0%	192	34.3%	81	14.5%		
South West	145	56	38.6%	39	26.9%	13	9.0%		
Wales	148	51	34.5%	32	21.6%	11	7.4%		
Northern Ireland	51	5	9.8%	5	9.8%	1	2.0%		
Scotland	28	5	17.9%	5	17.9%	1	3.6%		
Other EU	142	4	2.8%	4	2.8%	1	0.7%		
Other Overseas	370	29	7.8%	24	6.5%	12	3.2%		
Miscellaneous	4	0	0.0%	0	0.0%	0	0.0%		
Disabilities									
Blind/Partially sighted	2	0	0.0%	0	0.0%	0	0.0%		
Deaf/Hearing impaired	3	2	66.7%	2	66.7%	0	0.0%		
Dyslexia	20	7	35.0%	5	25.0%	3	15.0%		
Multiple	1	0	0.0%	0	0.0%	0	0.0%		
None	4,739	1,356	28.6%	1,075	22.7%	440	9.3%		
Other	3	2	66.7%	2	66.7%	0	0.0%		
Unseen disability	72	16	22.2%	14	19.4%	7	9.7%		
Wheelchair/mobility problems	1	0	0.0%	0	0.0%	0	0.0%		
School type									
Blank	605	63	10.4%	51	8.4%	38	6.3%		
Adult college	1	0	0.0%	0	0.0%	0	0.0%		
City Technical college	12	6	50.0%	5	41.7%	2	16.7%		
Comprehensive	614	206	33.6%	160	26.1%	55	9.0%		
Further education	813	165	20.3%	139	17.1%	51	6.3%		
Grammar	191	67	35.1%	55	28.8%	24	12.6%		
Grant maintained (formerly independent)	4	2	50.0%	1	25.0%	0	0.0%		
Grant maintained (special school)	61	4	6.6%	3	4.9%	0	0.0%		
Grant maintained (state)	608	209	34.4%	171	28.1%	74	12.2%		
Higher education	22	3	13.6%	1	4.5%	0	0.0%		
Independent	1,275	496	38.9%	384	30.1%	157	12.3%		
Language school	3	0	0.0%	0	0.0%	0	0.0%		
Other secondary	23	0	0.0%	0	0.0%	0	0.0%		
Sixth form centre	29	4	13.8%	4	13.8%	2	6.9%		
Sixth form college	580	158	27.2%	124	21.4%	47	8.1%		
Offer									
Blank	5								
Conditional	1,277	1,277	100.0%	1,016	79.6%	368	28.8%		
Reject	3,449								
Unconditional	106	106	100.0%	82	77.4%	82	77.4%		
Withdrawn	4								
Reply									
Blank	3,743	285	7.6%			2	0.1%		
Firm	836	836	100.0%	836	100.0%	440	52.6%		
Insurance	262	262	100.0%	262	100.0%	8	3.1%		
Accepted									
Blank	1								
No	4,390	933	21.3%	648	14.8%				
Yes	450	450	100.0%	450	100.0%	450	100.0%		

Table 3 Summary of univariate comparisons of candidates who were successful and those who were unsuccessful at each transition phase in the admissions process.

	Offer made by the dental school successful n=1,383 unsuccessful n=3,458	Applicant makes firm or insurance response to dental school yes (firm or insurance) n=1,098 no n=285	Applicant finally accepted to dental school yes=448 no=650
Age	Mann-Whitney U=1777424 p<0.001	Mann-Whitney U=147016 NS	Mann-Whitney U=125795 p<0.001
Sex male vs female	Chi-square=77.6 df=1 p<0.001	Chi-square=1.4 df=1 NS	Chi-square=0.06 df=1 NS
Ethnicity defined by nine ethnic groupings	Chi-square=232.4 df=8 p<0.001	Chi-square=20.4 df=8 p<0.01	Chi-square=22.9 df=8 p<0.01
Government office region London + South-East vs elsewhere	Chi-square=10.0 df=1 p<0.01	Chi-square=20.4 df=1 p<0.001	Chi-square=0.7 df=1 NS
Disability none vs any disability	Chi-square=0.2 df=1 NS	Chi-square=0.6 df=1 NS	Chi-square=0.7 df=1 NS
School type Independent school vs any other	Chi-square=50.9 df=1 p<0.001	Chi-square=1.8 df=1 NS	Chi-square=0.8 df=1 NS

offer is made by the school and the reply made by the applicant accepting or rejecting the offer. Furthermore actual A level grades were only available for those participants who were given an offer. A more satisfactory situation would be to have both the predicted and actual A level grades of all applicants.

The socio-demographic characteristics of applicants to the UMDS dental school were reviewed. Over this time there was a steady decline in the proportion of White applicants and an increase in the proportion of applications received from individuals of Indian ethnic origin. The proportion of applications from mature students also

declined. Female applicants constituted approximately 47% of all initial applications across the five years studied. The proportion of applications received from individuals with disabilities was small (2% of initial applications). Most applications originated from regions close to the dental school, and approximately one quarter of applicants were attending independent schools.

Not all applicants appear to be equally successful. A large proportion of applicants (over 70%) did not receive an offer of a place from the dental school. Between the receipt of an application by UCAS and the receipt by the student of an unconditional or conditional offer to study dentistry, two filtering mechanisms operate: applications are reviewed by admissions staff and unsuitable applications rejected; and all suitable applicants are interviewed. From the findings described here, it can be concluded that one or both of these processes favours female applicants, those of White origin and those from independent schools, while not favouring those with disabilities, mature students and those of Pakistani origin. The present data are not sufficient to distinguish the exact mechanism through which these differences occur. Previous research into applications for UK medical schools suggests that it is at the stage of reviewing admission forms that individuals from minority ethnic groups are most disadvantaged.⁸

A major component of the shortlisting procedure is the consideration of GCSE grades and predicted A level grades; it is possible that these factors differ according to the groups defined above – for example male students may be predicted poorer A level grades. While there is little published literature on the relationship between socio-demographic characteristics and predicted performance at A levels, there is

Table 4 Logistic regression analysis predicting candidates' success at the initial stage of the application process, whether the candidate was made an offer by the dental school. (Total n=4841: 1,383 candidates were made an offer, 3,458 were not made an offer).

Variable	Beta coefficient	Standard error	P	R	Exp(B)
Sex (female)	0.70	0.07	<0.001	0.13	2.01
Age (18 or younger)	0.79	0.08	<0.001	0.14	2.20
Ethnicity			<0.001	0.19	
Ethnicity (White)	0.72	0.17	<0.001	0.06	2.06
Ethnicity (Black Caribbean)	0.09	0.42	0.82	<0.001	1.09
Ethnicity (Black African)	-0.65	0.32	0.04	-0.02	0.52
Ethnicity (Indian)	-0.08	0.17	0.66	<0.001	0.92
Ethnicity (Pakistani)	-0.67	0.20	<0.001	-0.04	0.50
Ethnicity (Bangladeshi)	-0.56	0.30	0.06	-0.01	0.57
Ethnicity (Chinese)	-0.16	0.32	0.62	<0.001	0.86
Ethnicity (Other Asian)	-0.55	0.20	0.01	-0.03	0.58
Disability (None)	0.52	0.26	0.04	0.02	1.68
School (Non-independent school)	-0.51	0.08	<0.001	-0.09	0.60

Log-likelihood -4345.9; model Chi-square=474.5 (p<0.0001)

Table 5 Logistic regression analysis predicting whether candidates return firm or insurance acceptances of offers made. (1383 candidates were made an offer, 1098 returned firm or insurance acceptances).

Variable	Beta coefficient	Standard error	P	R	Exp(B)
Sex (Female)	0.11	0.14	0.40	<0.001	1.13
Age (18 or younger)	-0.14	0.16	0.39	<0.001	0.87
Ethnicity			<0.01	0.06	
Ethnicity (White)	-0.79	0.37	0.04	-0.04	0.45
Ethnicity (Black Caribbean)	-0.26	0.86	0.76	<0.001	0.77
Ethnicity (Black African)	0.05	0.84	0.95	<0.001	1.05
Ethnicity (Indian)	-0.36	0.38	0.34	<0.001	0.70
Ethnicity (Pakistani)	-0.11	0.47	0.81	<0.001	0.90
Ethnicity (Bangladeshi)	-0.67	0.63	0.28	<0.001	0.51
Ethnicity (Chinese)	-0.09	0.72	0.90	<0.001	0.92
Ethnicity (Other Asian)	-0.58	0.53	0.27	<0.001	1.79
Disability (None)	-0.47	0.56	0.40	<0.001	0.62
School (Non-independent school)	0.20	0.14	0.17	<0.001	1.22

Log-likelihood -1265.5; model Chi-square=33.6 (p<0.01)

Table 6 Logistic regression analysis predicting whether candidates were finally accepted to study dentistry. (1,098 returned firm or insurance acceptances, 448 were accepted to study dentistry at the former UMDS).

Variable	Beta coefficient	Standard error	P	R	Exp(B)
Sex (Female)	0.08	0.20	0.68	<0.001	1.03
Age (18 or younger)	-0.42	0.22	0.05	-0.04	0.65
Ethnicity		0.87	<0.001		
Ethnicity (White)	-0.11	0.45	0.81	<0.001	0.90
Ethnicity (Black Caribbean)	-0.74	1.08	0.49	<0.001	0.48
Ethnicity (Black African)	-1.15	0.89	0.20	<0.001	0.32
Ethnicity (Indian)	-0.29	0.45	0.52	<0.001	0.75
Ethnicity (Pakistani)	-0.14	0.56	0.80	<0.001	0.87
Ethnicity (Bangladeshi)	-0.30	1.01	0.77	<0.001	0.74
Ethnicity (Chinese)	0.63	0.86	0.47	<0.001	1.87
Ethnicity (Other Asian)	-0.30	0.53	0.57	<0.001	0.74
Disability (None)	0.45	0.61	0.46	<0.001	1.56
School (Non-independent school)	-0.25	0.21	0.24	<0.001	0.78
Reply to offer (Insurance)	-4.32	0.39	<0.001	-0.30	0.01
A level points (below offer made)	-3.75	0.25	<0.001	-0.42	0.02

Log-likelihood -681.1; model Chi-square=639.2 (p<0.001)

some evidence that the acquisition of actual qualifications necessary for entry into post-16 education is related to social class, gender and level of parental education.^{10,11} For example, the academic progress of Scottish school leavers has been examined.¹¹ Those with parents in social class II were five times more likely to achieve the standard university entry qualifications than school leavers whose parents were in classes IIIIM, IV or V. Where both parents had attended school or college past the age of 17, school leavers were more than twice as likely to attain the necessary qualifications in comparison with those whose parents had not been educated past 16 years of age. Female students were 20% more likely than male students to gain the entry qualifications.

Further research is required to identify ethnic and school differences in performance at GCSE, in predictions of A level grades, and their relationship to admissions procedures. Overseas candidates may also be disadvantaged at this stage of the application process because some qualifications are not perceived as equivalent for entry to UK universities. Finally, a proportion of candidates may not be offered a place to study dentistry following an interview. The UCAS do not collect data on whether applicants are interviewed, or on the outcome of an interview. Such information could be collected at the local level, and would provide a further insight into the application process.

The transition between the offer by the dental school and the acceptance by the student as either 'firm' or 'insurance' is largely the choice of the student, influenced by many factors including the students' experience of the campus. The only significant predictor of students taking up the offer was that the applicant was White; it is not clear why this is so.

The final stage of entry is the acceptance of the student to study dentistry at the dental school following publication of the A level results. At this stage, students may have been lost either as the result of failure to achieve the required grades, or because they took up a place at another dental school; these factors are the most powerful predictors of final acceptance. Socio-demographic characteristics have been found to be poor predictors of actual entry to university-level education, once applicants had been filtered through earlier stages of the application process.¹¹ However having accepted the offer as 'firm' or 'insurance' is a highly significant predictor of final acceptance to the course. This area requires further exploration. It is possible that the factors which influence the nature of the acceptance can explain socio-demographic differences in the application process.

The interpretation of these findings is crucial. One possible interpretation is that the bias which exists at the stage of the offer from the dental school is unjustified. That is, candidates from independent schools or female candidates, although preferred at interview/offer, are no more suited to the study of dentistry than applicants from other groups. Therefore male applicants and those from non-independent schools are discriminated against. However, a second interpretation is possible: the admissions procedure is a highly effective screening device for suitability for a career in dentistry, and socio-demographic differences reflect differences in ability. Two pieces of evidence must be weighed against this second interpretation. First, Hoad-Reddick, MacFarlane and Gibson⁵ report that socio-demographic characteristics were very poor predictors of performance in the first year of the dental course. Second, any interpretation of the

findings must account for the effect of ethnicity. Though White candidates are successful at the early stages of the application process, they are less likely to be accepted at the final stage possibly indicating a lack of ability in some candidates.

The extent to which the patterns identified in this study are generalisable to other dental schools is a matter for empirical verification. For instance, characteristics of the campus and existing student body are likely to influence candidates' choice of school after acceptance. The former UMDS was located in central London, and many of the applications came from London and the South East of England. This is an area of the UK with a high proportion of individuals from minority ethnic groups. Further the present study did not explore the social class of applicants. It is possible that social class exerts a strong influence upon both choice of dental school and the success of applications.¹¹ In future research it will be important to identify both the impact of social class on the success of applications and the particular stage of the application process at which such impact occurs. There is an urgent need to investigate further the relationship between the application process and success in the study of dentistry. The present study provides a methodological model for such research. A prospective study including a number of dental schools in the United Kingdom, which recorded both predicted and achieved A level outcomes for all applicants as well as their demographic characteristics at all stages of the application process would provide more robust data.

CONCLUSIONS

Any conclusions drawn from this study must be tempered by a consideration of its limitations. The data were analysed retrospectively and did not contain information regarding predicted and achieved A level results. Given this, it has been demonstrated, for the first time in the United Kingdom, that entry to a UK dental school was related to socio-demographic characteristics. Female applicants, those of White ethnic origin, and those who attended independent schools were more likely to be successful in the application process. The exact mechanism of this differential success is unknown. It is likely that various mechanisms operate at different stages of the application process, including differential performance at A level examination. Further research is required to identify the mechanisms by which differential success rates occur and the generalisability of these findings to other dental schools. A prospective study including a number of dental schools in the UK which records

both predicted and achieved A level grades would provide more definitive information on the impact of socio-demographic factors on admission to dental school. The goal of all such research should be to ensure that the selection of dental students is fair, equitable and based upon their suitability to become excellent dentists.

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