An investigation of the relationship between ethnicity and success in a BSc (Hons) Physiotherapy degree programme in the UK

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Abstract

Objectives: To explore the potential relationship between ethnicity and achievement within undergraduate physiotherapy education.

Design: A retrospective analysis of assessment marks awarded for academic and clinical modules.

Setting: A London university offering undergraduate physiotherapy education.
Participants: 448 undergraduate students enrolled onto the Physiotherapy honours degree programme between 2005-2009.

Main Outcome Measures: Marks awarded following academic or clinical assessment. These were modelled through multivariate regression analysis to evaluate the relationship between marks awarded and ethnicity.

Results: Differences were noted between ethnic categories in final programme success and across academic and clinical modules. Our multivariate analysis demonstrated students from Asian backgrounds had decreased odds of succeeding compared with white British students (adjusted OR 0.43 95%CI 0.24, 0.79 p=0.006), as had Black students (adjusted OR 0.42 95%CI 0.19, 0.95 p=0.036) and students from Other ethnic backgrounds (adjusted OR 0.41 95%CI 0.20, 0.87 p=0.020).

Conclusions: This analysis of undergraduate physiotherapy students illustrated a persistent difference in attainment between students from white British and those from BME backgrounds. Heterogeneity in academic outcomes both within and between minority ethnic groups was illustrated. This study not only reinforces the need to consider ethnicity within physiotherapy education but also raises further questions about why physiotherapy students from BME groups perform less well than their white British peers.

Key Words Physiotherapy, education, ethnicity

Introduction

National Health Service workforce and education strategies aim to train and employ people who reflect the diversity of the local population [1, 2]. Whilst these policies are directed towards improving quality of care, developing a workforce that not only reflects the local population but also understands and respects individual diversity is challenging [3]. Physiotherapists, alongside other
health care professionals in the UK, are currently not representative of the diversity evident in the population as a whole [4, 5]. Concerns about this situation have resulted in efforts to widen participation in physiotherapy education, mirroring a parallel focus in Higher Education more generally [6].

The profile of physiotherapy students in the UK has only recently changed from a dominance of young, white females [7] to a national demographic which includes 30% male and 50% mature entrants [8,9]. The numbers of students entering physiotherapy education from a minority ethnic background is also increasing, from under 5% in 2005 [10] to 12% nationally in 2010 [9]. However, as yet there has been little formal exploration of the impact of diversity on educational achievement and outcome, with the few studies within the UK exploring the impact of gender [8, 12] and entry criteria [11]. Ethnicity, specifically within the UK physiotherapy context, has only been considered in our recent exploratory study [13]. The analysis found a difference in assessed performance on final clinical placements in students from Black and Minority Ethnic (BME) backgrounds. Several other exploratory studies from America have also suggested that physiotherapy students from minority ethnic backgrounds may not be as successful as their white peers [14, 15, 16]. Similar findings have been reported in related health fields including nursing [17] and medicine [18, 19, 20, 21], and in university courses more generally [22] in several countries.

The studies reported here highlight a potential relationship between ethnicity and achievement in healthcare education in general and physiotherapy education in particular. However, the relationship between achievement in physiotherapy education and ethnicity remains uncertain. Further research is required to understand whether a relationship exists between ethnicity and educational outcome in physiotherapy education.
To this aim this study further explored the potential relationship between ethnicity and achievement within undergraduate physiotherapy education. Two specific research questions were addressed:

1. What is the relationship between self-identified ethnicity and overall success on an undergraduate physiotherapy programme?

2. What is the relationship between self-identified ethnicity and different assessment profiles of undergraduate physiotherapy students?

Methods

A retrospective analysis was conducted of all marks awarded for academic and clinical modules across all three levels of study for all physiotherapy students enrolled onto the BSc (Hons) physiotherapy degree programme (both for the 3 year full-time route and the 4 year part-time route) between 2005-2009 at one London University. These five cohorts covered the entire period that this validated programme was delivered. Consequently, course content and assessment processes were stable over the study period. For ease of data interpretation, results are presented in years 1-3 as this relates to the level of learning for both the full and part-time students.

A database was compiled by two of the researchers (AW, MN) using data for each academic and clinical module across each year of the physiotherapy degree programme and including final course achievement (course completed, intermediary award, course failure academic and other). A third researcher (SN) independently checked data for accuracy.

Demographic variables were entered as follows: age at time of entry to the programme (mature ≥ 21 years, standard entry < 21 years), self-identified gender and mode of study (full-time 3 year route or
part-time 4 year route). Self-identified ethnicity was categorised into white British, Asian, Black and Other. The categories of ethnicity were used as they are recognised as widely representative within other published literature [23]. Further sub-divisions were not statistically feasible given limited numbers. These demographic details were considered important as previous studies have suggested they may influence outcome [24, 21, 17]. A further classification of socioeconomic status was sought, as research in education more widely has indicated a relationship between socioeconomic background and success on academic courses at undergraduate level [25]. Such data was not accessible through University records. Data for the POLAR2 quintile [26], which is an approximation of education participation and widely used in widening participation studies, was therefore used as a proxy for social demographics. The POLAR2 classification is based on permanent address postcodes and comprises five categories ordered from 1 (wards with the lowest participation in higher education) to 5 (wards with the highest participation). To maximise statistical power, these quintiles were grouped in a binary fashion with groups 1 and 2 representing ‘low participation’ (equivalent to the lowest 40% participating in higher education) and groups 3-5 representing ‘high participation’. All demographic data was verified through official student records. Students with missing data were removed from the database.

This study was considered by the School of Health Sciences and Social Care Research Ethics Committee who deemed research ethics approval unnecessary as the data utilised was routine, previously collected and anonymised. The compiled data was held on password protected computers accessible only to the research team.
Chi squared, Fisher’s exact test or one way ANOVA were used to determine whether there was a bivariate association between socio-demographic characteristics (gender, age, mode of study, ethnicity and educational participation) and outcomes.

The relationship between physiotherapy degree (physiotherapy degree versus no physiotherapy degree) and ethnicity was investigated with a logistic regression model. Multiple linear regression was used to model the relationship between scores (marks as percentages) on individual modules and ethnicity. All models controlled for age group at entry, gender, mode of entry (full or part time) and educational participation. All analyses were carried out using Stata version 12 (StataCorp, 2011).

Results

Descriptive Data

The data from 461 students were included in the database. 13 students were removed due to missing ethnicity data. As summarised in table 1, 298 (67%) participants were under 21 years, 390 (87%) studied on a full time route, 307 (69%) students were female and 129 (29%) students described their ethnicity as from Black Minority Ethnic (BME) background. Of those, the largest sub-category was Asian (58, 45%) followed by Other (43, 33%) and Black (28, 22%). Measures of educational participation (POLAR2 quintile) revealed only 27 students (6%) in a low educational participation category (POLAR 2 groups 1 & 2).

(Table 1)
A number of significant associations were observed between the ethnicity subgroups (Table 1). Notably, Asian students had a significantly greater percentage of students aged under 21 (76%, p=0.005) and studying on a full-time route (97%, p<0.001) compared with other ethnicities. The Other ethnic background consisted of 81% females, higher than white British, Asian and Black (71%, 53%, and 54% respectively, p=0.004). There was no statistically significant difference in the number of students from a low educational participation category between ethnicities.

**Multifactorial analysis**

On investigating degree success, striking differences were demonstrated between ethnic categories (table 2). Students from Asian backgrounds had decreased odds of succeeding compared with white students (OR 0.43 95%CI 0.24, 0.79 p=0.006), as had Black students (OR 0.42 95%CI 0.19, 0.95 p=0.036) and students from other ethnic backgrounds (OR 0.41 95%CI 0.20, 0.87 p=0.020).

These differences are also apparent when considering success across years, when modules are categorised as either academic or clinical and through mode of assessment (written or practical examination). For example students from Asian backgrounds, on average scored significantly lower than their white British peers across all years. However, the effect size is greatest at level one (-7.58 95% CI -12.66, -2.50). This contrasts with the students from Black backgrounds who had a more even profile across the course and the students categorised as Other ethnic background whose score was significantly lower than white British students at level three (-3.02, 95% CI -5.70, -0.34).

Furthermore, students from Asian backgrounds on average achieve 6.06% (95% CI -8.33, -0.78) lower marks than white students on modules assessed practically and in contrast to those assessed through written work (-1.44, 95% CI -3.40, 0.53). While students from Black backgrounds on average
scored lower in practical assessments (-5.13, 95% CI -8.22, -2.04), their average score in clinical assessments was on average 6.93% (95% CI -9.92, -3.95) lower than white students.

(Table 2)

When considering specific modular results a number of associations can be noted (Table 3). The students from Asian backgrounds were awarded statistically lower scores in 11 of 16 modules. Of these, three showed an average difference of over 10 percentage points. All of these (modules 3, 4 and 6) are practical exams conducted within the University. This relationship was in part followed by students from Black backgrounds who illustrated statistical different lower marks in nine modules. Like the students from Asian background, they also demonstrated lower marks with a large effect size in module 4. However they were also scored lower in module 15, which is the last clinical placement prior to graduation.

(Table 3)

Discussion

The primary finding of this research is a large discrepancy in degree attainment between the white British and BME students. It is notable that the poorer attainment of a physiotherapy degree across the BME groups persisted across the three subcategories and remained stable when controlled for known variables of influence – age, gender, mode of study and participation. Several research studies have considered the discrepancy between the achievement of first degree between white British and BME students. Whilst much of this literature considers attainment of degree by degree classification, the pattern of attainment parallels that in this study. Connor, La Valle, Tackey and
Perryman [24] for example reported a survey considering two groups of 136 students (one BME group, one white British group) graduating from four British HEIs, matched for key variables. 65% of white British students were awarded ‘good’ degrees, with a corresponding figure of 34% for BME students. Similar findings were reported by other research groups [27, 28, 25, 29, 30, 31]. These researchers all reported that in general white British students are not only more likely to obtain good degrees than students from other ethnic groups, but they are more likely to obtain a first-class honours degree.

In addition to the differences in degree attainment, this study highlighted some heterogeneity between the different minority ethnic groups. Of specific note is the difference between practical and written assessments for the students from Asian backgrounds and in part the students from Black backgrounds. This finding is paralleled in medical education literature. Yates and James [21] for example reported non-white ethnicity to be a risk factor associated more strongly with lower marks on the clinical course as compared to written assignments. However, a lack of specific data in this paper limits extrapolation of these findings. Likewise Stegers-Jager et al [19] noted that students from BME backgrounds performed less well than their white peers in assessed clinical performance. Within physiotherapy literature, studies in the USA have indicated differences on clinical placement scores based on ethnicity [15]. Others demonstrate a more universal disadvantage based on ethnicity [16], which would perhaps mirror more closely the experience of the students of Black backgrounds in this study, a pattern reported in other literature considering academic performance within Higher Education [25].

Descriptive data from this current study demonstrated a high percentage of students from minority ethnic backgrounds and younger cohorts as compared with national figures. The very low
representation of undergraduate students from low educational participation backgrounds is of note. While comparable data is not available nationally, a trend for physiotherapy to be dominated by those from the middle classes is noted historically [32], suggesting a continuation of social bias in people seeking to qualify as a physiotherapist. This pattern is reflected in medicine, with calls to consider the social and cultural factors which may problematically limit access to the profession [33].

The results from this retrospective analysis of results cannot fully unpick the reasons for the difference in the marks awarded. Other studies suggest some areas and it is likely that the observed differences result from a complex interaction of a number of factors. Mason and Sparkes [34] discuss multiple potential factors which may limit the success of students from BME backgrounds within physiotherapy. In their view, lecturers may lack cultural competence and course content may lack cultural equivalence. Ridley [35] further argued that the type of learning undertaken by students may also be associated with poorer outcome and reported that superficial learning was favoured by students from Black backgrounds. Other suggestions that may account for the differences reported in this and other studies include considerations of students’ other working commitments and related time, social and economic pressures, the potential for and impact of low expectations by staff, low parental education, limited numbers of staff from BME backgrounds and a lack in transparency in moderation processes [31]. Quality of prior educational attainment has also been suggested [21, 24]. Specifically within physiotherapy Haskins et al [14] in the USA identified the potential for covert examiner bias in clinical assessments based on ethnicity, a finding supported by a study of Dutch medical student performance and qualitative studies of medical students and their educators in the UK [18,20]. These studies may offer some explanation for the difference in practical and written assessments reported in the present study, although clearly this area needs further investigation.
While the studies cited may suggest possible explanations for findings of this current study, they are both limited in rigour and direct relevance to an undergraduate physiotherapy course in the UK context. Consequently, given the data presented in this study, there is a need to validate the findings through further robust examination of assessment results and ethnicity, and to explore the specific reasons within the undergraduate physiotherapy programme for the discrepancies reported here in order to develop tools and strategies to maximise chances of success for all students.

Limitations

There are notable limitations with the data used in this study and subsequently the interpretation of results. A rigorous data inputting and checking process was undertaken with only validated marks and socio-demographic data utilised. However, we do acknowledge that the categorisation of both the POLAR2 quintile and ethnicity results in potential loss of heterogeneity within the categories, a heterogeneity which has significance in education [36]. Also, whilst accepting that the POLAR2 quintile is used by HEFCE [26] as a proxy for socioeconomic status, as a crude measure of participation it does not accurately reflect the socioeconomic position of individual students. It is possible therefore that the effect of ethnicity has been inflated within this study.

It is also recognised that previous academic performance of students was not included within the modelling process. Previous educational achievement is considered in other literature as an influencing factor on degree success and performance at University [21, 24]. However, on this particular degree course, admission includes very high academic requirements and subsequently disparity between students is limited. Furthermore multiple variables were included in the model which strengthens the study.
Conclusion

This analysis of five cohorts of undergraduate physiotherapy students illustrated a persistent difference in attainment between students from white British and those from BME backgrounds. Heterogeneity within and between minority ethnic groups was illustrated. This study reinforces the need to consider ethnicity within physiotherapy education. The data presented in this study raises further questions about the consistently poorer performance in physiotherapy students from a BME group in comparison to white British students.

Implications for future research

This study calls for two further strands of research. Firstly, a broad examination of success in physiotherapy undergraduate courses and ethnicity at national level. Such an exploration would require the development of a robust and transparent reporting tool that included additional student demographic data, specifically that pertaining to socioeconomic status. Secondly, there is a critical need to explore why such differences occur and to further examine the heterogeneity within ethnic groups. Echoing calls from a previous study [13] such exploration is essential if student success is to be maximised.

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Ethical approval; Reviewed by Brunel University Research Ethics Committee – none required (see Methods section for details).

Conflict of interest: None declared

References


Table 1 Characteristics of physiotherapy students by ethnicity grouping

<table>
<thead>
<tr>
<th>Variable</th>
<th>White British</th>
<th>Asian</th>
<th>Black</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/N or mean</td>
<td>% or (SD)</td>
<td>n/N or mean</td>
<td>% or (SD)</td>
</tr>
<tr>
<td>Under 21</td>
<td>218/319</td>
<td>68</td>
<td>44/58</td>
<td>76</td>
</tr>
<tr>
<td>Full time</td>
<td>282/319</td>
<td>88</td>
<td>56/58</td>
<td>97</td>
</tr>
<tr>
<td>Female</td>
<td>226/319</td>
<td>71</td>
<td>31/58</td>
<td>53</td>
</tr>
<tr>
<td>Low educational participation</td>
<td>24/305</td>
<td>8</td>
<td>2/56</td>
<td>4</td>
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</table>

Table 2 – Degree award and academic achievement by minority ethnic group at year level and module type controlling for age group at entry, gender, mode of entry and social participation group

<table>
<thead>
<tr>
<th>Asian</th>
<th>Black</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient</td>
<td>95% CI</td>
<td>p-value</td>
</tr>
<tr>
<td>Module</td>
<td>Coefficient</td>
<td>95% CI</td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Physio degree**</td>
<td>0.43</td>
<td>(0.24, 0.79)</td>
</tr>
<tr>
<td>Year 1 average</td>
<td>-10.00</td>
<td>(-13.63, -6.36)</td>
</tr>
<tr>
<td>Year 2 average</td>
<td>-6.21</td>
<td>(-8.31, -4.11)</td>
</tr>
<tr>
<td>Year 3 average</td>
<td>-2.14</td>
<td>(-4.29, 0.00)</td>
</tr>
<tr>
<td>Academic modules</td>
<td>-4.67</td>
<td>(-6.79, 2.54)</td>
</tr>
<tr>
<td>Clinical modules</td>
<td>-3.59</td>
<td>(-5.78, 1.39)</td>
</tr>
<tr>
<td>Written modules</td>
<td>-1.44</td>
<td>(-3.40, 0.53)</td>
</tr>
<tr>
<td>Practical modules</td>
<td>-6.06</td>
<td>(-8.33, 3.78)</td>
</tr>
</tbody>
</table>

*statistically significant at 0.05

**Odds ratio

Reference category is white British

Table 3 – Module marks by minority ethnic groups controlling for age group at entry, gender, mode of entry and social participation group.

<table>
<thead>
<tr>
<th>Module</th>
<th>Asian</th>
<th>Black</th>
<th>Other</th>
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<tbody>
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<td></td>
<td>Coefficient</td>
<td>95% CI</td>
<td>p-value</td>
</tr>
<tr>
<td>Module 1</td>
<td>-9.09</td>
<td>(-13.43, -4.76)</td>
<td>&lt;0.001*</td>
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<tr>
<td>Module 2</td>
<td>-1.96</td>
<td>(-4.96, 1.05)</td>
<td>0.201</td>
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<tr>
<td>Module 3</td>
<td>-14.89</td>
<td>(-20.75, -8.96)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Module</td>
<td>Value</td>
<td>95% CI</td>
<td>t-value</td>
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<tr>
<td>--------</td>
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<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>Module 4</td>
<td>-15.82</td>
<td>(-21.92, -9.72)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Module 5</td>
<td>-6.93</td>
<td>(-11.02, -2.84)</td>
<td>0.001*</td>
</tr>
<tr>
<td>Module 6</td>
<td>-11.82</td>
<td>(-15.77, -7.88)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Module 7</td>
<td>-4.55</td>
<td>(-8.08, -1.02)</td>
<td>0.012*</td>
</tr>
<tr>
<td>Module 8</td>
<td>-6.47</td>
<td>(-9.08, -3.85)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Module 9</td>
<td>-7.85</td>
<td>(-11.12, -4.58)</td>
<td>&lt;0.001*</td>
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<td>Module 10</td>
<td>-3.15</td>
<td>(-6.22, 0.07)</td>
<td>0.045*</td>
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<td>(-12.92, -5.09)</td>
<td>&lt;0.001*</td>
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<td>Module 12</td>
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<td>Module 13</td>
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<td>-4.14</td>
<td>(-7.48, -0.81)</td>
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<tr>
<td>Module 15</td>
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<td>(-7.76, 1.03)</td>
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<td>Module 16</td>
<td>-2.39</td>
<td>(-6.19, 1.42)</td>
<td>0.218</td>
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</table>

*statistically significant at p<0.05
Reference category is white British