The Anatomy and Physiology of the Medical Class of 1982a

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ABSTRACT

Background: *Studies of medical student outcome have been used to assist in medical manpower planning. There have been no published studies on medical graduates of The University of the West Indies (UWI). This study investigates the demographic characteristics, professional and social outcomes of the Class of 1982a, twenty-five years after qualification.*

Method: *Data on demographic characteristics at entry and academic performance during medical school were obtained from UWI administrative records. Data on specialty training, migration and current social status were obtained by interview. Statistical analysis was conducted using simple frequencies, chi-square and t-tests.*

Results: *There was an intake of 110 students with 108 completing the course. The mean age at entry was 21.8 ± 3.0 years; 74.0% were male. Some 80.6% of students were from Jamaica, Trinidad and Tobago, and Barbados. Only 15.7% were admitted directly from high school. A quarter of students were scholarship awardees, with the majority being from Eastern Caribbean countries (*$p < 0.001$*). Female students outperformed male students (*$p < 0.05$*). Just over 70% of graduates pursued postgraduate training, the majority in North America. Approximately two-thirds of graduates were practising in the Caribbean region. Almost all graduates (95.0%) trained in the Caribbean were practising in the region but less than a third of those trained elsewhere were (*$p < 0.001$*).*

Conclusion: *This study has provided important information on choice of specialty training, migration and the associated factors twenty-five years ago. The information provided can therefore be used as a base for examining the trends in medical education over time and the factors influencing these trends, allowing for better planning of the manpower needs of the region.*

Anatomía y Fisiología de la Clase Médica de 1982a

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RESUMEN

Antecedentes: *Se han usado estudios de los resultados en estudiantes de medicina para ayudar en la planificación de los recursos humanos en la medicina. No ha habido ningún estudio sobre los graduados de medicina de la Universidad de West Indies. Este estudio investiga las características demográficas, y los resultados profesionales y sociales de la Clase de 1982a, veinticinco años después de que adquirieran su calificación.*

Métodos: *A partir de datos que obran en los archivos administrativos de la Universidad UWI, se obtuvieron datos de las características demográficas al momento del ingreso, y del rendimiento académico. Los datos sobre el entrenamiento en relación con la especialidad, la migración y estado social actual, fueron obtenidos mediante entrevista. El análisis estadístico se llevó a cabo usando frecuencias simples, chi-cuadrado y pruebas t.*

Resultados: *Hubo un registro de 110 estudiantes, de los cuales 108 terminaron el curso. La edad promedio al momento del ingreso fue 21.8 ± 3.0 años; 74.0% eran varones. Alrededor del 80.6% de los estudiantes eran de Jamaica, Trinidad y Tobago, y Barbados. Sólo el 15.7% ingresaron directamente de la escuela secundaria. Un cuarto de los estudiantes había recibido becas, y procedía en su mayoría de países del Caribe Oriental (*$p < 0.001$*). El rendimiento de las estudiantes hembras estuvo por encima del de los estudiantes varones (*$p < 0.05$*). Más del 70% de los graduados pasaron*

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entrenamientos de postgrado, la mayor parte de ellos en los Estados Unidos de Norteamérica. Aproximadamente dos tercios de los graduados estuvieron de práctica en la región del Caribe. Casi todos los graduados (95.0%) entrenados en el Caribe, estuvieron practicando en la región, pero menos de un tercio de los entrenados en otra parte fue ($p < 0.001$*).*

Conclusión: *Este estudio ha proporcionado información importante sobre la opción de especialización, migración, y los factores asociados, hace veinte años. Por tanto, la información proporcionada puede usarse como base para examinar las tendencias en la educación médica en un período de tiempo. De igual modo pueden examinarse los factores que influyen sobre estas tendencias, haciendo posible de ese modo una mejor planificación de las necesidades de recursos humanos de la región..*

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INTRODUCTION

The University of the West Indies (UWI) has recently celebrated 60 years of existence. The Faculty of Medicine was the first to be established at the UWI in 1948, with an initial intake of thirty-three students from across the English-speaking Caribbean. There have been no published studies on the medical graduates of the UWI. Information for planning for subspecialty training and healthcare delivery for the Caribbean region, based on medical student data, has therefore not been available.

Research on medical students has primarily been undertaken in developed countries and has been particularly focussed on the factors that have influenced their choice of specialty (1–7). Students who enter medical school having obtained a first degree have been shown to be more likely to choose a career in general practice (5). Other factors influencing career choice include mentoring from a faculty advisor, future income and the opportunity to work with new technology (4). Increasingly however, lifestyle friendly specialties, such as dermatology and public health, are being chosen especially among females (6). Academically stronger students have been shown to be more likely to pursue the surgical specialties, and in particular, the surgical subspecialties (7). Choice of specialty is often expressed during undergraduate medical training. Almost two-thirds of medical students pursue their first choice of specialty (3). The most common reasons for a change in choice of specialty were reappraisal of aptitude and abilities, altered domestic circumstances, knowledge of promotion and career prospects and experience in other specialties (3).

A few studies have looked at location of physician practice, both within a country (8) and migration (9). Within a country, physician location is determined by the size of the physician's or his/her spouse's community of origin, opportunity for continuing education and contact with colleagues (8). Physician migration is primarily associated with perceived financial benefit (9).

The socio-emotional aspects of the life of medical students have received little attention. In a study of intra-professional marriages (10), the desire to marry a doctor was significantly greater for female students. This was ascribed to status congruency, better understanding of professional roles and the socialization of this marriage pattern among female medical students. This latter finding was peculiar to the Indian culture (10). What is often described as the 'dark side' of medical school has also been studied (11). Medical school is stressful and can lead to dropout and incipient mental illness and emotional disturbance. These have contributed substantially to academic failure both during and after medical school and may even result in premature death (11).

At 60 years, the UWI has come of age, with students from a number of medical classes having completed subspecialty training. The medical students of the Class of 1982a graduated over 25 years ago, making this class ideal for a comprehensive study of medical graduates of UWI. Most graduates would have completed specialty training and would be living in an area of their choosing rather than that of training. Additionally, at the time of graduation, specialty training was available at the UWI in internal medicine, paediatrics, obstetrics and gynaecology, general and ENT surgery.

This study reviews the demographic characteristics of the Class of 1982a at entry to medical school, performance during medical school, as well as choice of specialty, migration, marital status and factors associated with these choices. In essence, then, this paper reports on the anatomy and physiology of the Class of 1982a.

METHOD

The sample included all students entering the Faculty of Medicine in September 1977, with expected graduation in June 1982. Data were collected from three different sources:

(1) demographic data on age at entry, gender, country of origin, matriculation status and scholarship awards were retrieved from the UWI's student database.

(2) data on student performance were obtained from student records held at the Faculty of Medical Sciences. Grades for major UWI examinations, such as the 2nd MB examinations in Anatomy, Physiology and Biochemistry taken at the end of 18 months of the course; the Pharmacology and Pathology and Microbiology examinations taken at the end of the 3rd and 4th years, respectively, and the examinations in Medicine, Surgery and Obstetrics and Gynaecology taken at the end of the fifth and final year were retrieved. In addition, clerkship grades from the intro-

ductory and junior clerkships in medicine and surgery occurring in the third year, and those from the senior clerkships occurring in the fourth and final years, were also retrieved. A single composite academic performance score was calculated by assigning numerical values, to the eight subjects for which there were major UWI examinations and the sixteen clerkship examinations. Major examination grades of Distinction, Honours or Pass were assigned scores of 15, 10 and 5, respectively, based on first attempts at the examination. As all students are required to pass these examinations, students who were successful at the first and second repeat attempts at these examinations were assigned scores of three and one, respectively.

Clerkship examinations with grades ranging from A+ to F were assigned scores from 15 to 1 (3). Specialty training, practice location and marital status were obtained by interview with graduates. A multiple informant method was utilized, with some graduates providing information for those that were not able to be contacted.

Data were analyzed using simple frequencies, the chi-square test for analysis of categorical variables and the students' t-test for analysis of continuous variables.

This study received ethical approval from the UHWI/UWI Faculty of Medical Sciences Ethical Committee

RESULTS

Student Characteristics at Entry

There were 110 entrants to medical school in 1977: four students (3.6% of the initial intake) did not complete the course to the first major examination at 18 months. Two Caribbean students transferred from universities in other countries at the end of the first 18 months of the course. There were 108 students who completed the course, 80 males (74.0%) and 28 females (26.0%). As shown in Table 1, the majority of students (80.6%) were from Jamaica, Trinidad and Tobago, and Barbados. The mean age of students was 21.8 ± 3.0 years with a range of 17.9 – 34.5 years. Only four students were over 30 years at entry. There was no significant difference in mean age at admission by gender. Though Jamaican students were slightly younger (mean age of 21.4 years), this was not significantly different to the mean ages of students from Trinidad and Tobago (21.7 years) and students from other countries in the region (22.6 years).

Table 1: Country of origin and gender distribution

Country of origin	No. of students (%)	Males (%)	Females (%)
Jamaica	50 (46.3)	32 (64.0)	18 (36.0)
Trinidad and Tobago	29 (26.9)	23 (79.3)	6 (20.0)
Barbados	8 (7.4)	8 (100)	–
Bahamas	4 (3.7)	4 (100)	–
Guyana	4 (3.7)	4 (100)	–
Antigua	3 (2.8)	2 (66.7)	1 (33.3)
Belize	2 (1.9)	2 (100)	–
St Lucia	2 (1.9)	2 (100)	–
St Vincent	2 (1.9)	–	2 (100)
British Virgin Island	1 (0.9)	1 (100)	–
Dominica	1 (0.9)	–	–
Grenada	1 (0.9)	1 (100)	1 (100)
St Kitts	1 (0.9)	1 (100)	
Total	108	82	28

There were 28 scholarship winners within the class (25.9%), with 27.5% of males (22/80) and 21.4% of females (6/28) receiving scholarships, a non-significant difference. Only 12.0% of Jamaican students and 14.3% of Trinidadian students received scholarships while 65.5% of students from other countries within the region received scholarships ($p < 0.001$). Scholarship awardees had a lower mean age (20.3 years) than other students [22.2 years] ($p < 0.002$).

The majority of students 55.6% (n = 60) entering the Faculty of Medicine were transfer-students, almost all having commenced UWI as students of the Faculty of Natural Sciences where they were enrolled for a year or two. The two students transferring from other universities were previously enrolled in medical programmes. Only 15.7% (n = 17) entered UWI from high schools whereas 28.7% (n = 31) had a first degree. Male students were more likely to enter medical school directly from high school (18.8%), compared to female students (7.1%).

Academic Performance

Complete academic performance scores were calculated for 87 students (80.5%). The gender distribution for this subgroup was similar to the entire population. The mean academic performance score was 168.0 ± 24.5, with minimum and maximum scores of 102 and 240, respectively. The mean score for females was 176.5 and that for males 164.6 ($p < 0.05$). When analyzed by stage of training, males outperformed females in all subjects at the 2nd MB examinations and at the Pharmacology examination, but females outperformed males at the Pathology and Microbiology examinations. These differences were not statistically significant. At the final clinical examinations, females outperformed males in all three subjects but statistical significance was obtained only for obstetrics and gynaecology ($p < 0.002$). Though females obtained higher scores in ten of sixteen clerkship examinations, there were no statistically significant gender differences.

The mean academic score of students from other countries in the region was highest at 175.4 with Jamaicans and Trinidadians obtaining scores of 169.4 and 159.0 respectively ($p = 0.05$). The mean academic score of scholarship winners was 174.2 ± 27.6 while that of non-scholarship winners was 165.4 ± 21.3, a non-significant difference. There was also no significant difference between male and female scholarship winners who obtained scores of 169.1 ± 28.7 and 191.0 + 15.9, respectively. Students who entered medical school from high school, as transfer-students from UWI or with first degrees had similar academic scores.

Information on course completion dates was available for 90 students (83.3%); 84.4% of students graduated in June 1982, with the other 15.6% graduating either six months or a year later.

Specialty Training

Some 29.9% of graduates (n = 32) became general practitioners, another 29.9% completed postgraduate training in the medical specialties (internal medicine, paediatrics, haematology, psychiatry) and 25.2% completed postgraduate training in the surgical specialties (general surgery, orthopaedics, ophthalmology, ENT, cardiothoracic surgery, urology, obstetrics and gynaecology) [Table 2]. Other graduates completed specialty training in pathology, microbiology, anaesthetics, radiology, public health, physiatry and occupational health. Gender was a strong determinant of choice of specialty training; 43.8% of those who completed training in the medical specialties and 18.8% of those entering general practice but only 7.4% of those completing training in the surgical specialties were female ($p < 0.02$). At the time of writing, three graduates (2.7%) were no longer practising medicine; two of these three are business persons.

Table 2: Choice of Specialty

Specialty	Number	(%)
General Practice	32	(29.9)
Medical Specialties	32	(29.9)
Paediatrics	15	
Internal Medicine	12	
Haematology	2	
Dermatology	2	
Psychiatry	1	
Surgical Specialties	18	(16.2)
General Surgery	8	
ENT	3	
Ophthalmology	2	
Orthopaedics	2	
Urology	2	
Cardiothoracic	1	
Obstetrics and Gynaecology	9	(8.1).
Anaesthetics	4	
Pathology	4	
Radiology	3	
Microbiology	1	
Public Health	1	
Physiatry (Rehab Medicine)	1	

Graduates who became general practitioners were older with a mean age of 22.9 years, while those who entered the surgical and medical specialties had mean ages of 21.5 and 20.9 years, but these differences were not significant. In keeping with this trend, 39.7% of those graduates who had a first degree went into general practice as compared with 22.6% who completed specialty medical training and 25.8% who completed specialty surgical training. Although a greater proportion of Trinidadian students (85.2%) completed medical or surgical specialty training, when compared with Jamaican students (63.3%) or students from other countries (65.5%), these differences were not significant. Scholarship recipients were no more likely to enter postgraduate training than their peers. The mean academic score was not significantly associated with choice of specialty training.

Overall, 56 graduates (58.3%) left the Caribbean region for further training, with the others entering general practice within the region or postgraduate training at UWI. Trinidadian students were less likely to stay in the region after graduation (21.1%) than Jamaican students (48.0%) or students from other countries (44.4%). However, country differences were not statistically significant. Of those graduates completing specialty or postgraduate training (n = 74), 69.9% obtained their training in North America, 23.3% at UWI and only 6.8% in the United Kingdom. The choice of specialty was not associated with the region in which training was obtained.

Migration

Twenty-five years after graduation, the location of practice of 102 graduates was obtained. Of these, 63.7% were practising within the Caribbean region, 32.3% in North America and 3.9% in the United Kingdom. Three quarters of graduates in North America (75.8%) were in the United States of America. Males were more likely to migrate from the Caribbean region (40.0%) than females (25.9%), but this difference was not statistically significant. The presence of a scholarship did not significantly influence graduates to remain within the Caribbean.

Some 95.0% of those who stayed within the region as general practitioners or for specialty training were still practising in the Caribbean region, while only 30.9% of those who entered specialty training programmes outside of the Caribbean were ($p < 0.001$).

Social Status

The current marital status of 84 members of the class (77.8%) was obtained. Of this group, 84.6% were married, 9.0% were unmarried and 6.4% were either divorced or separated. Gender and choice of specialty were not significantly associated with marital status. There were seven intra-class marriages and twenty-one intra-professional (doctor-doctor) marriages.

DISCUSSION

In September 1977, 110 students from thirteen English-speaking Caribbean islands entered the Faculty of Medicine at Mona, Jamaica. This is an average intake for medical schools in Canada (9). Jamaica, Trinidad and Tobago, and Barbados, the most populated of the Caribbean countries, together accounted for almost 80% of students. This would have been influenced by a pre-determined allocation of students per country. Twenty-five years ago there was a 3:1 ratio of males to females. Today, that ratio has been reversed with females outnumbering males by a factor of 3 – 4:1 at

medical school entry. Jamaica, however, was already showing a tendency towards equality of the genders with the ratio of females to males less than 2:1. Trinidad and Tobago had a male: female ratio of 4:1, and the rest of the countries combined had a 5:1 ratio. The predominance of females admitted to medical schools represents a global trend over the last two decades, particularly in those societies where females have an equal opportunity to higher education (6).

The mean age of entry to medical school at UWI was 21.8 years. The mean age of entry to medical schools in the UK is 18 years, with the majority of graduates entering directly from high school (5). In the USA, where a first degree is required for matriculation, the mean age at graduation is 26 years, similar to that for UWI (2). The majority of entrants to UWI was previously enrolled in the Faculty of Natural Sciences or had completed a first degree. This is probably accounted for by two main factors. Students who had completed university courses were considered to be at a higher educational level than those completing Advanced Level courses at high school. Therefore, only those high school students who performed exceptionally well were accepted directly to medical school. Additionally, students who had completed two years of university courses may have decided to complete their degrees prior to commencing medical school. Though this was probably meant to offer an alternative in case the medical course was not completed, our results show that all students completed the course.

Academic performance was not associated with age, matriculation status or the presence of a scholarship award but with gender. Females outperformed males overall, but particularly so at the later clinical stages of the course.

The proportion of the class that went into general practice (30%) is within that quoted in the literature 27–39% (2, 5). Though not significant in this study, there was a trend for older students and those with first degrees to enter general practice. This has been the finding of other authors (5, 6,12). In this study, a career in general practice was not associated with capacity for specialty training as judged by performance in medical school. The literature suggests that academically stronger students choose the surgical subspecialties (8). This was not supported by our study. The desire to have a surgical career has been identified as being of more importance to men than women (13), with females choosing more lifestyle friendly specialties (6). Our findings are similar, with females avoiding the surgical specialties, despite higher academic scores.

The majority of graduates chose to enter postgraduate training overseas, despite access to postgraduate training within the region. A number of factors might have contributed to this phenomenon. Those wishing to pursue careers in the surgical specialties other than general surgery or ENT would have had to seek training overseas. However, this cannot be the only reason, as choice of specialty was not associated with region of training. Some students may have wished exposure to postgraduate training in a developed country. For others, immigrant status may have been an important factor. Many Caribbean persons have immigrant status in other countries, particularly North America. Undergraduate medical training is costly despite immigrant status. However, postgraduate training, where one is salaried and there are no fees, is more financially viable.

Postgraduate training overseas, however, was not without consequences for the Caribbean. Only a third of those who left the Caribbean region for specialty training returned, representing a significant human resource and financial loss to the region. Investing in younger graduates, as Caribbean governments did through scholarships, did not result in these graduates staying in or returning to the region in greater number.

In our society, there are no social pressures to marry a physician as compared with other societies (10). The number of interprofessional marriages is more likely a result of the time of ones life when one is likely to choose a life partner and also the time spent together as a group throughout the five years of medical school. The proportion of intra-class marriages is, however, striking.

Of the four students who dropped out of medical school, one has died, one is in business, one completed a science degree and one could not be located. One study has shown that students who do not complete medical school have an increased susceptibility to stress and early death (11).

This study has provided important information on choice of specialty training, migration and the associated factors for graduates of twenty-five years ago. Much has changed in our medical school, in the Caribbean environment and in the world since then. The gender ratio of current medical school entrants is evidence of one such change. Others include revision of matriculation requirements at the UWI, access to a wide range of postgraduate specialty programmes in the Caribbean and reduced access to specialty training overseas, all of which may impact on the physician capital of the region. This study can therefore be used as a base for examining the trends in medical education over time and the factors influencing these trends, allowing for better planning of the manpower needs of the region. This study was limited by its retrospective nature. This did not allow the analysis of some factors investigated in other studies, such as students' choice of specialty on entering medical school. It is recommended that a tracking system for medical students in the region be instituted, allowing for more detailed prospective study.

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