

Choice of medical speciality: a cross-sectional study of medical students and comparison with existing practice.

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DOAJ: [ea62608040d740bebaa7f5bdaf987a63](https://doi.org/10.2196/med.2021.10000)

DOI:

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Abstract

Objective

The objectives of this study were to determine specialty choices, influencing factors, and migration intent among medical students, and to compare this with current specialist practitioners in Trinidad and Tobago (TT).

Methods

A Cross-sectional study using an online survey was conducted at the School of Medicine, Faculty of Medical Sciences, University of the West Indies, St Augustine Campus, TT. Descriptive statistics were presented for choice of speciality, its predictors, and comparisons with specialists in practice were done.

Results

Overall, 273 (response rate 21.36%) students responded with 73.6% females and an average age of 22.5(SD3.3) The ten most popular responses for speciality of first choice were unsure (9.5%), cardiothoracic surgery (8.7%), general paediatrics (8.7%), general surgery (7.5%), neurosurgery (7.5%), obstetrics and gynaecology (6.7%), cardiology (4.8%), emergency medicine (4.4%), family medicine (4.4%) and orthopaedics (4.4%). The top three factors influencing their choices were, general interest in the field (95.9%), job security (81.3%) and job availability (70.3%), Most respondents (72%) expressed intent to migrate to specialize. Compared to specialist practitioners, significantly more students aspired to do cardiothoracic surgery, neurosurgery, pediatric surgery, and cardiology, while significantly less students chose internal medicine, anaesthesia and critical care, and ophthalmology. ($P < 0.05$ for all)

Conclusions

A minority of students was uncertain about speciality choice, however most intended to migrate to specialize. A mismatch between student aspirations and current practice was also found. These findings warrant student sensitization to specialties for which there is a need and workplace planning, if we are to retain locally trained doctors.

Keywords: Medical student, specialization, cross-sectional study, postgraduate, Trinidad and Tobago.

INTRODUCTION

The relative lack of medical specialists in certain fields⁽¹⁾ and the urgent need for specialist training in Trinidad and Tobago (TT)⁽²⁾ have been highlighted. The local School of Medicine at the Faculty of Medical Sciences, University of the West Indies graduates over 200 physicians yearly. However, despite an abundance of fully registered physicians the shortage of specialists, has been attributed by some, to the lack of opportunities.⁽³⁾ Challenges faced regarding medical specialization in TT⁽³⁾ are difficulties meeting the requirements of the available speciality programmes, lack of residency post and the lack of training in certain fields. This has resulted in physicians migrating abroad for residency training as well as the importation of specialists from foreign lands to fill gaps as a temporary measure.

As postgraduate medical education is a necessity for the creation of specialists, medical students are a key in determining partly by choice the specialists of the future. A 2007 TT study⁽⁴⁾ which examined first year medical students, concluded that internal medicine was the most popular, surgical specialities were the most attractive and that students had reservations about psychiatry. This study⁽⁴⁾ also found that medical students valued the diagnosis and treatment of disease, and the ability to help patients as motivating factors. Medical school is an opportune time to select a field as studies^(5,6) have shown that experience as a student and progression through the various years of medical school can influence choice. Several systematic reviews⁽⁷⁻¹⁰⁾ have examined this topic, citing numerous influencing factors for career choice. However, rarely have studies on speciality choice placed the aspirations of medical students within the context of contemporary speciality practice in the same setting.

The main objectives of this study were to determine speciality choices and influencing factors, and migration intent among medical students, as well as to compare their aspirations with the distribution of existing registered specialist practitioners in TT.

METHODS

The aim of this study was to measure medical student choice of career and its influencing factors, and how these matches with current practice. A cross-sectional study was conducted. The medical school study population consisted of 1,278 enrolled students in years 1

-5 of the medical degree programme at the Faculty of Medical Sciences, University of the West Indies, St Augustine Campus, TT. Convenient sampling was used through electronic invitation to participate by class representatives for all years through mailing lists and snowball sampling. The existing specialist population was all registered physicians on the online speciality register (1,563) listed according to the Medical Board of Trinidad and Tobago (MBTT).⁽¹¹⁾

Data collection was conducted via an online survey. The first section sought demographics. The second section listed most specialties and respondents had to select their single most preferred speciality for 1st, 2nd and 3rd choice. Influencing factors, and their self-rated level of importance on a Likert scale for chosen speciality, were also listed based on review of the literature.^(7,12) Demographics, choice of speciality (1st, 2nd and 3rd), motivating factors, migration intent and related reasons were the main sections of the questionnaire. The questionnaire was reviewed for face validity by the authors and pilot tested on a group of 8 students who were not part of the final study. Minor alterations to phrasing were made to the final instrument. Reliability of the questionnaire was assessed by internal consistency of the domains assessing reasons for choice and migration. The MBTT online specialist register was used to abstract data on the distribution of specialist physicians.

Using an estimated proportion of 50% on the responses of the questionnaire, a minimum sample size for a simple proportion of 296 was calculated using 95% confidence interval and 5% margin of error. This was adjusted for the finite student population of this study of 1,278.

The collected data was analysed using the Statistical Product and Service Solutions software (SPSS version 25.0) for statistical analysis. Descriptive data was presented using proportions and means. Comparisons were done using Chi square and Fishers exact tests for categorical and ordinal variables and t-testing for continuous data. Logistic regression models were used to determine odds ratios with 95% confidence intervals. Cronbach's alpha was used to check for internal consistency of questionnaire domains. A *P* value of < 0.05 was deemed statistically significant.

RESULTS

The response rate obtained was 21.36% (273/1278). Table 1 illustrates the socio demographic data collected.

The distribution of responses across years 1, 2, 3, 4 and 5 were 34%, 32.2%, 11%, 13.2% and 9.2% respectively, with an average age of 23 years. Most respondents were female (73.6%) compared to male (26.4%), with 95.6% of all participants being single and from Trinidad and Tobago (91.9%). Most respondents paid local fees (95.2%) and received GATE (Government assisted tertiary education) funding (36.1%), followed by scholarship funding (28.6%).

Figures 1, 2 and 3 shows the ranked specialties based on the respondents' 1st, 2nd, and 3rd choices.

The top 1st, 2nd and 3rd choice were cardiothoracic surgery/general paediatrics, general surgery and family medicine respectively. One in ten respondents were unsure of first choice specialization. Of the choices outlined, 5 respondents chose *other* specialties. Two respondents opted for sports and exercise medicine as their preferred choice of speciality, whilst genomic medicine, interventional radiology and vascular surgery each had 1 respondent opting for them. Of note, there were several specialties that no student selected as 1st choice. These were the fields of infectious disease, maxillofacial surgery, medical oncology, occupational medicine, paediatric critical care, paediatric gastroenterology, physical medicine, pulmonology, rheumatology, venereology and urology. Of these, neither maxillofacial surgery, medical oncology or venereology, was selected as 2nd or 3rd choice specialties.

Table 2 below illustrates the importance of the factors that influence medical students' choice of medical speciality.

The 5 most common reasons were general interest in the field, job security, job availability, interest in research in the field and need for specialists in the field. Cronbach's alpha for the items in this domain was 0.899.

Several associations arose between certain first choice specialties and motivations factors for the choice.

Male students had significantly increased odds (OR: 3.757, 1.547-9.12, $P=0.003$) of choosing cardiothoracic surgery compared to females. Mentor influence (OR: 5.264, 1.021-27.143, $P=0.047$) and length of training (OR:7.888, 1.345-46.268, $P=0.022$) emerged as factors that were ranked higher in level of importance in those who choose

Table 1. Socio-demographics of respondents.

Variables (n=273)	Frequency (%)
Age	#22.55±3.3
Gender	
Male	72 (26.4%)
Female	201 (73.6%)
Marital Status	
Single	261 (95.6%)
Married	5 (1.8%)
Engaged/In a Relationship	6 (2.2%)
Divorced/Separated	1(0.4%)
Country of Origin	
Trinidad and Tobago	251 (91.9%)
International/Regional	22 (8.1%)
Previous Degree	
Yes	35 (12.8%)
No	238 (87.2%)
Year of Study	
1	94 (34.4%)
2	88 (32.2%)
3	30 (11.0%)
4	36 (13.2%)
5	25 (9.2%)
Fee category	
Local	260 (95.2%)
International	13 (4.8%)
Type of Funding	
Self-Funded	21 (5.6%)
Spouse Funded	1 (0.3%)
Scholarship Funded	107 (28.6%)
Student Loan Funded	23 (6.1%)
*GATE Funded	135 (36.1%)
Parent Funded	87 (23.3%)

*Government assisted tertiary education.

Table 2: Factors influencing choice of medical speciality

<i>Reason for Choice of Speciality</i>	Percentage (%)				
	Very Important	Important	Neutral Importance	Somewhat Important	Not Important
<i>General Interest in Field</i>	78.0	17.9	1.5	0.4	2.2
<i>Job Security</i>	44.7	36.6	10.6	2.9	6.1
<i>Effect of Job Availability</i>	39.2	31.1	15.4	5.5	8.8
<i>Interest in Research in Field</i>	38.5	26.7	18.7	8.4	7.7
<i>Need for Specialist in Field</i>	37.0	32.6	17.9	4.4	8.1
<i>Lifestyle/ Work-Life Balance</i>	35.5	31.5	13.6	5.1	14.3
<i>Rotations</i>	32.2	21.2	19.4	3.3	23.8
<i>Experience Working in Speciality</i>	31.9	25.6	14.7	5.9	22.0
<i>Research Opportunities</i>	31.5	22.7	24.2	9.9	11.7
<i>Ability to Repay Debt</i>	29.7	24.5	22.0	6.6	17.2
<i>Frequency of Direct Patient Interaction</i>	27.8	32.2	23.1	6.2	10.6
<i>Paraclinical Courses</i>	27.1	22.7	23.1	5.1	22.0
<i>Preclinical Courses</i>	26.7	23.8	21.6	6.6	21.2
<i>Salary</i>	21.2	29.7	25.6	8.8	14.7
<i>Length of Training</i>	20.1	27.5	25.6	8.4	18.3
<i>Effect of Mentor</i>	19.4	28.9	19.0	8.1	24.5
<i>Experience as Patient</i>	19.0	19.4	19.4	9.5	32.6
<i>Preference to Working in Urban Area</i>	10.3	18.3	35.9	10.3	25.3
<i>Social Status Linked to Field</i>	8.4	13.2	25.3	13.2	39.9
<i>Parental Influence</i>	7.7	13.9	24.9	14.7	38.8
<i>Preference to Working in Rural Area</i>	6.2	9.5	40.3	11.7	32.2

cardiothoracic surgery even after adjustment for gender. Students who placed most importance on Lifestyle/Work-life Balance were less likely to choose the field of neurosurgery. (OR:0.237, 0.063-0.891, $P=0.033$) Conversely those who valued social status were more likely to select neurosurgery (OR:9.815, 2.155-44.699, $P=0.003$)

Significantly more female students (8.5%) choose Obstetrics/ Gynaecology compared to 0% of males ($P=0.008$) The only sociodemographic factor that was associated with family medicine was the year of study. Year 4 students were more likely to choose this field compared to year 1 students. (OR:26.571, 3.185-221.67, $P=0.002$) The importance of experience as a patient was

Figure 1: Top ten first choice specialities chosen by medical students

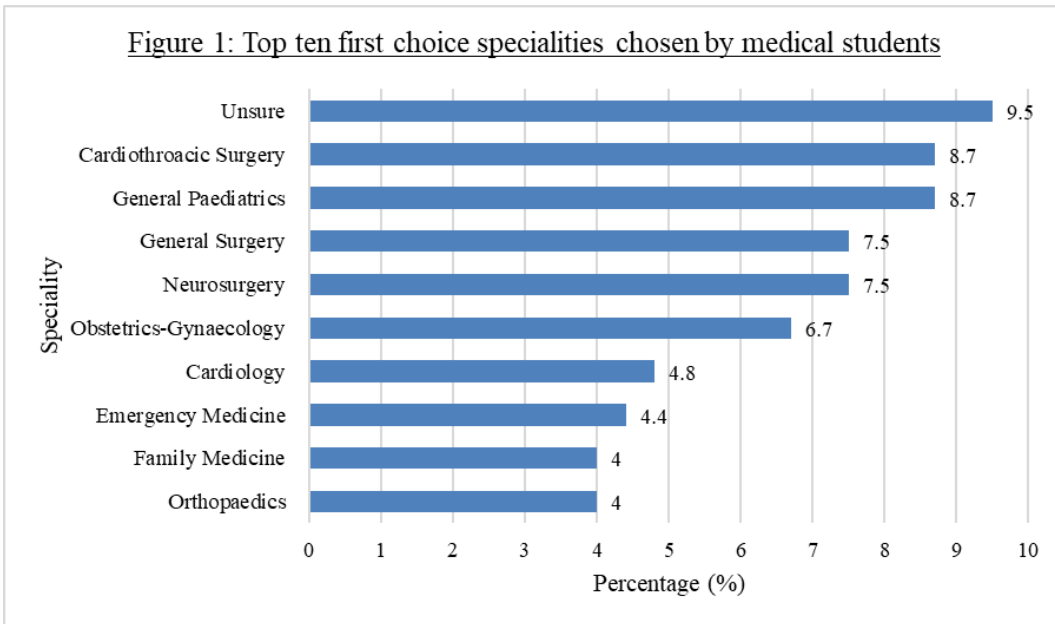


Figure 2: Top ten second choice specialities chosen by medical students

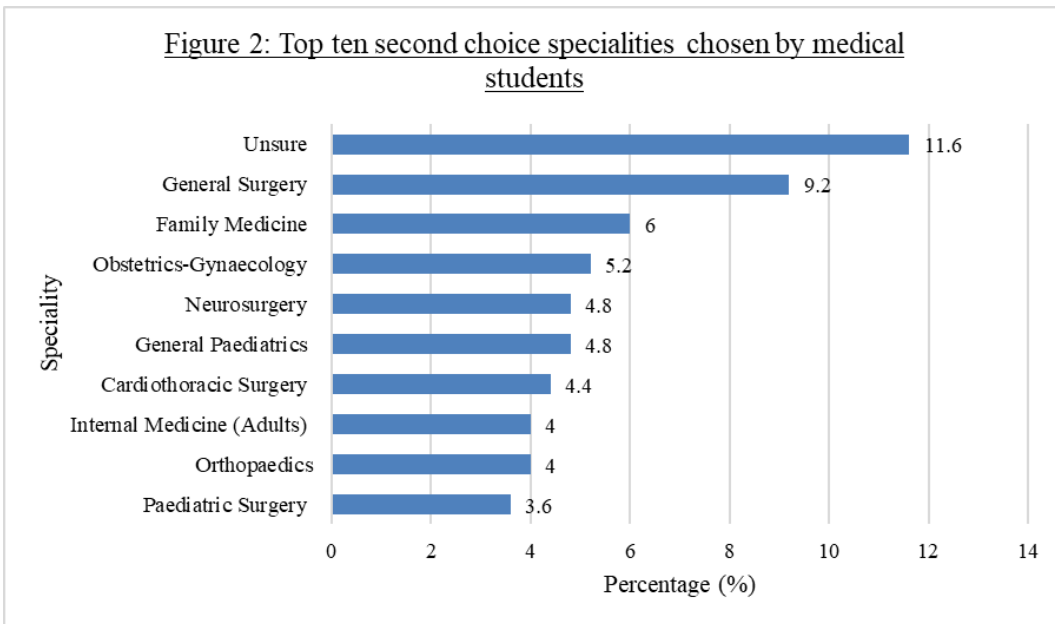


Figure 3: Top ten third choice specialities chosen by medical students

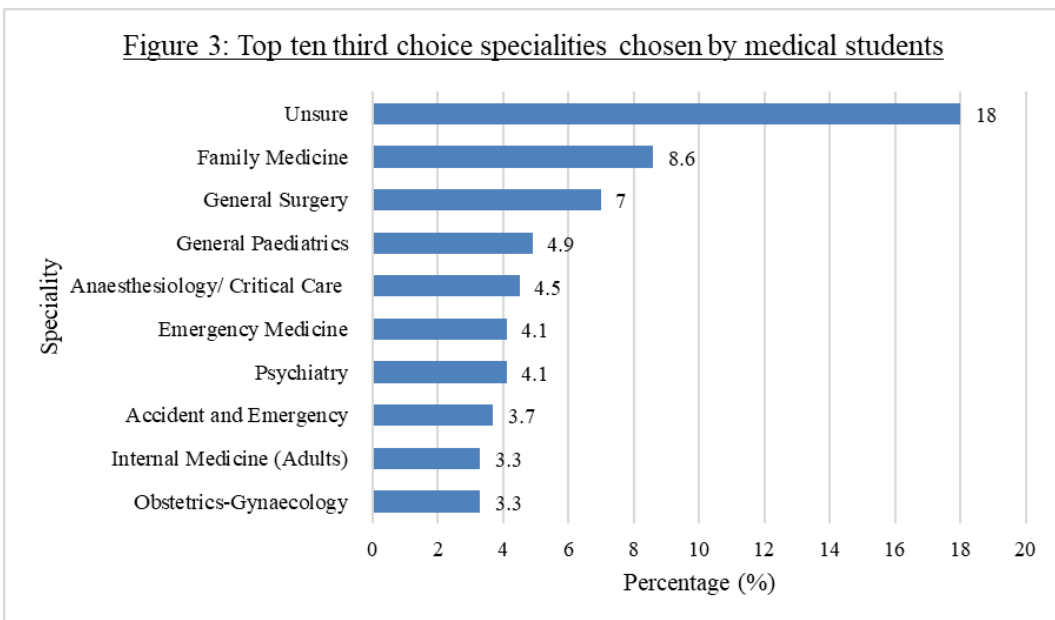


Table 3. Reasons for migration to specialize.

Reason for migration to specialize	Frequency (%)
Better opportunities in destination	170 (86.3%)
Training unavailable in homeland	120 (60.9%)
Better work environment in destination	119 (60.4%)
Better salaries in destination	111 (56.3%)
Lack of variety of cases in homeland	80 (40.6%)
Need for specialist in destination	36 (18.3%)
Lower tuition in destination	25 (12.7%)

significantly associated with those who choose psychiatry. (OR:9.167, 1.041-80.739, $P=0.046$)

For the grouped surgical specialities, there were no associations between any of the socio demographics. Of all the motivating factors, only importance of working in an urban setting was positively associated with surgical fields (OR:2.407, 1.113-5.205, $P=0.026$)

For the grouped internal medicine and subspecialties (anaesthesia/critical care, cardiology, dermatology, endocrinology, gastroenterology, haematology, infectious disease, internal medicine adults, medical oncology, nephrology, neurology, oncology, pulmonology, rheumatology, and venerology) no predictors arose. ($P>0.05$ for all) In further analyses specialties were grouped into exclusive paediatric fields including general paediatrics and paediatric subspecialties of cardiology, neurology, gastroenterology, developmental, oncology, surgery, neonatology, and anaesthesia and intensive care. Of the students who selected a field of first choice 39 (14.2%) choose an exclusively paediatric field. Female gender was positively correlated with selection of a paediatric field (OR:3.637, 1.245-10.623, $P=0.018$) Of the motivating factors, higher importance of the frequency of direct patient interaction was also associated with choosing a paediatric speciality. (OR:5.062, 1.106-23.178, $P=0.037$) This association was however nullified when adjusted for gender (OR:4.596, 0.992-21.301, $P=0.051$).

Of the respondents, 197 (72%) expressed intention to

migrate to specialize. For the 1st choice speciality, 151 (60%) students selected a field for which speciality training was available locally. Of the students who intended to migrate after graduation to specialize abroad, 56% selected a field for which speciality training existed locally vs. 69% of those who did not plan to migrate ($P=0.08$)

Table 3 illustrates the ranked reasons for migration. Cronbach's alpha for the items in this domain was 0.617.

Of a total number of 6,093 registered physicians in TT, 1,563 (25.6%) were registered as specialists according to the medical board. In additional analyses, the percentage of medical students selecting their 1st choice speciality was compared to the distribution of registered practitioners in the respective field. Significantly more students aspired to do cardiothoracic surgery (8.7% vs. 0.5%, $P<0.001$), neurosurgery (7.5% vs. 0.8%, $P<0.001$), pediatric surgery (2.8% vs. 0.3%, $P=0.001$) and cardiology (4.8% vs. 1.7%, $P<0.001$), while significantly less students chose internal medicine (1.2% vs. 18.4%, $P<0.001$), anesthesia and critical care (2.8% vs. 8.0%, $P=0.001$) and ophthalmology (1.6% vs. 4.2%, $P=0.036$). The proportions of students selecting other fields were similar to the proportion of respective specialist practitioners. ($P>0.05$ for all)

DISCUSSION

From the findings of this study, cardiothoracic surgery and general paediatrics were the most preferred specialties for 1st choice followed by general surgery as 2nd choice and family medicine as a 3rd choice. Specialties of general surgery, obstetrics and gynaecology, emergency medicine, orthopaedic surgery and pathology made their way into the top 10 specialties by 1st choice. This fits mostly with the systematically reviewed literature. ⁽⁸⁾

Similarly compared to the 2007 TT study⁽⁴⁾, year 1 medical students chose surgery, paediatrics, family medicine and psychiatry. The field of internal medicine however was chosen by less students in this study when compared to the previous TT study.⁽⁴⁾ Possible reasons for this may be the perceived saturation of the field as internal medicine was the most common field of practising TT specialists.

In this study several surgical specialties were consistently ranked in 1st – 3rd choice specialties. Surgery specialties have been shown to dominate students' choices within most medical schools globally.⁽⁸⁾ The uncertainty of choice in 1 in 10 students in this study also compares with other studies⁽¹³⁾ where medical students remained undecided. Of note there were several specialties in this survey that no student selected as first choice. This represents an opportunity for education and sensitization.

Whilst this research showed cardiothoracic surgery was the most popular chosen speciality, the specialties of general paediatrics, general surgery, obstetrics/ gynaecology, family medicine and orthopaedics were ranked in the top 10 specialties chosen by students as their first choice, and were also consistent with specialist practice in TT according to the MBTT register.⁽¹¹⁾ There were however several discordant fields where significantly greater proportions of students were interested in cardiothoracic surgery, neurosurgery, paediatric surgery and cardiology than their practising counterparts. This may represent genuine interests in these fields which may not necessarily translate into future specialization. Conversely less students hoped to specialize in internal medicine, anaesthesia and critical care and ophthalmology compared to the proportion of

practising consultants in these areas.

At the authors' medical school there exists speciality training programs in general internal medicine, emergency medicine, family medicine, paediatrics, psychiatry, radiology, psychology, anatomical pathology, haematology, medical oncology, neurosurgery, anaesthetics and intensive care, obstetrics and gynaecology, ophthalmology, orthopaedic surgery, general surgery and urology.⁽¹⁴⁾ The apparent unpopularity of some specialties in this study despite the presence of local programs may be explained by oversaturation of these fields, limited access to residency posts or general lack of interest in the field.

From data obtained, there were no associations between social demographics and the choice of general paediatrics, neurosurgery, cardiology, emergency medicine, orthopaedics, pathology, haematology, radiology and internal medicine with its sub-specialties. This contradicts studies ^(15,16) which showed that men outweighed women in the specialties of cardiology, internal medicine, radiology, emergency medicine, neurosurgery, and orthopaedics. As the top choice speciality, cardiothoracic surgery was chosen mostly by males as opposed to females, who chose predominantly paediatrics subspecialties and obstetrics and gynaecology, which coincides with previous studies.⁽¹⁷⁾ Several studies^(7,9,18) have reported that medical student debt was associated with pursuit of higher paying specialties, or increased the value of anticipated income after graduation. This contrasts with the findings of this TT study where source of funding was independent of speciality choices. This can be explained by the fact that most participants received either government (GATE) funding, scholarships, or parental funding, making student debt an unlikely predictor.

The motivating factors for choice of speciality in this study coincides with a systematic review⁽⁷⁾ which showed academic interest, flexible work schedule, patient service orientation, career opportunities and student debt to be the leading factors. In this study, mentor influence, job availability, social status, year of study, personal experience as a patient, emerged as significant predictors for certain specialties. The frequency of direct patient contact and working in an urban setting were also significant influencing factors in this study for the grouped paediatric and surgical fields respectively.

Almost three fourths of students in this survey expressed hope to travel abroad to specialize despite the presence of 17 core speciality training programs locally. There was no association between migration intent and 1st choice speciality offered locally, suggesting that there are other deciding factors. Better opportunities, unavailability of training, better work environment and better salaries were given as the top 4 migratory reasons. Prior studies (19,20) have found that poor working conditions, financial conditions, job opportunities and residency training were similarly the main motivators for migration among medical students.

The strengths of this study were, it examined students across all years of medical school, included previously validated and reliable questionnaires, and it provided updated knowledge within the context of existing practice. The major limitation was selection bias in the convenience of online sampling.

A formal manpower needs assessment for medical specialists is needed in TT to prioritize efforts. Funding of residency posts, postgraduate training, mentoring and interventions pitched at the level of students have been the recommendations of a systematic review.⁽²¹⁾ Expansion of existing training programs to include fellowships for sub-specialities may alleviate shortages in these areas. Dedicated scholarships for postgraduate training abroad may also fill gaps for the minority specialities that are much needed, but unavailable locally. Retention of locals who emigrate for training is of paramount importance for long term sustenance of underserved specialties. Research monitoring the trends in student choice and longitudinal follow up of graduates to see how well student choice matches eventual career, is needed.

CONCLUSIONS

This study provided a much-needed update of the choices of careers among medical students at the Faculty of Medical Sciences, St. Augustine Campus, Trinidad and Tobago. While students' aspirations mirrored existing practice for most specialities, mismatches exist for certain careers. While some students seem unsure of a choice of speciality, the majority of students hope to migrate abroad for specialization. This warrants a physician workforce assessment to determine current and future needs. Interventions during medical school are needed to

sensitive students to the various fields and those that are in demand. Residency funding and improved access to postgraduate training are needed to avoid brain-drain and prevent the uneven distribution of physicians in specialist departments in TT.

List of abbreviations

TT – Trinidad and Tobago

MBTT - Medical Board of Trinidad and Tobago

GATE – Government Assisted Tertiary Education

Declarations: All authors have no declarations of interest

Ethics approval and consent to participate: Ethical approval was granted by Research Ethics Committee, St. Augustine Campus, University of the West Indies (Ref: CREC-SA0.759-02-2021). All data collected was anonymous.

Consent for publication: Informed consent was ensured by respondents agreeing to proceed to the online survey after ticking a checkbox indicating they understood all terms.

Availability of data and materials: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests: The authors declare that they have no competing interests

Funding: Not applicable

Authors' contributions: SM, RM and RB made substantial contributions to the conception and design of the work. RM, RB, RJ, RR, RL, RC, RR and RB made substantial contributions to the acquisition of data for the work. SM completed the data analysis. All authors drafted the manuscript, revised it for intellectual content and gave final approval for it to be submitted for publication.

References

1. The medical specialist dilemma in T&T [Internet]. [cited 2021 Jul 16]. Available from: <http://www.guardian.co.tt/article/the-medical-specialist-dilemma-in-tt-6.2.923136.fb8af2da4a>
2. Confronting the health system's paradox [Internet].

- Trinidad Express Newspapers. [cited 2021 Jul 16]. Available from: https://trinidadexpress.com/opinion/editorials/confronting-the-health-system-s-paradox/article_ac89353e-9c34-11e8-8bba-0f16662f787c.html
3. T&T Medical Association: Lack of opportunities for specialisation | Loop Trinidad & Tobago [Internet]. Loop News. [cited 2021 Jul 15]. Available from: <https://tt.loopnews.com/content/tt-medical-association-lack-opportunities-specialisation>
 4. Baboolal NS, Hutchinson GA. Factors affecting future choice of specialty among first-year medical students of the University of the West Indies, Trinidad. *Med Educ*. 2007 Jan;41(1):50–6.
 5. Abdulghani HM, Al-Shaikh G, Alhujayri AK, Alohaideb NS, Alsaeed HA, Alshohayeb IS, et al. What determines the selection of undergraduate medical students to the specialty of their future careers? *Med Teach*. 2013;35 Suppl 1:S25-30.
 6. Compton MT, Frank E, Elon L, Carrera J. Changes in U.S. medical students' specialty interests over the course of medical school. *J Gen Intern Med*. 2008 Jul;23(7):1095–100.
 7. Yang Y, Li J, Wu X, Wang J, Li W, Zhu Y, et al. Factors influencing subspecialty choice among medical students: a systematic review and meta-analysis. *BMJ Open*. 2019 Mar 1;9(3):e022097.
 8. Levallant M, Levallant L, Lerolle N, Vallet B, Hamel-Broza J-F. Factors influencing medical students' choice of specialization: A gender based systematic review. *EClinicalMedicine*. 2020 Oct 24;28:100589.
 9. Pisaniello MS, Asahina AT, Bacchi S, Wagner M, Perry SW, Wong M-L, et al. Effect of medical student debt on mental health, academic performance and specialty choice: a systematic review. *BMJ Open*. 2019 Jul 2;9(7):e029980.
 10. Goel S, Angeli F, Dhirar N, Singla N, Ruwaard D. What motivates medical students to select medical studies: a systematic literature review. *BMC Med Educ*. 2018 Jan 17;18(1):16.
 11. Medical Board of Trinidad and Tobago. MBTT-Specialist Register [Internet]. Oct, 2020. Available from: <http://www.mbtb.org/Specialist%20Register.htm>
 12. Gill H, McLeod S, Duerksen K, Szafran O. Factors influencing medical students' choice of family medicine: effects of rural versus urban background. *Can Fam Physician Med Fam Can*. 2012 Nov;58(11):e649-657.
 13. Grasreiner D, Dahmen U, Settmacher U. Specialty preferences and influencing factors: a repeated cross-sectional survey of first- to sixth-year medical students in Jena, Germany. *BMC Med Educ*. 2018 May 9;18(1):103.
 14. Postgraduate Programmes at The Faculty of Medical Sciences [Internet]. 2021 [cited 2021 Jul 15]. Available from: <https://sta.uwi.edu/fms/programmes>
 15. Active physicians in U.S. by specialty and gender [Internet]. Statista. [cited 2021 Jul 15]. Available from: <https://www.statista.com/statistics/439728/active-physicians-by-specialty-and-gender-in-the-us/>
 16. Palikuca S. Men outnumber women in many specialties in the US and U.K. [Internet]. The DO. 2018 [cited 2021 Jul 15]. Available from: <http://thedo.osteopathic.org/2018/10/men-outnumber-women-3-to-1-in-some-specialties-in-the-u-k/>
 17. Asaad M, Zayegh O, Badawi J, Hmidi Z shikh, Alhamid A, Tarzi M, et al. Gender differences in specialty preference among medical Students at Aleppo University: a cross-sectional study. *BMC Med Educ*. 2020 Jun 5;20(1):184.
 18. Grayson MS, Newton DA, Thompson LF. Payback time: the associations of debt and income with medical student career choice. *Med Educ*. 2012;46(10):983–91.
 19. George G, Reardon C. Preparing for export? Medical and nursing student migration intentions post-qualification in South Africa. *Afr J Prim Health Care Fam Med*. 2013 May 13;5(1):483.
 20. Imran N, Azeem Z, Haider II, Amjad N, Bhatti MR. Brain Drain: Post Graduation Migration Intentions and the influencing factors among Medical Graduates from Lahore, Pakistan. *BMC Res Notes*. 2011 Oct 17;4:417.
 21. Darbyshire D, Gordon M, Baker P, Agius S, McAleer S. Systematic review of interventions to encourage careers in academic medicine. *Med Teach*. 2019 Jan;41(1):61–7.