Original Article

Acceptability of Medical Students by Patients from Private and Public Family Practices and Specialist Outpatient Clinics

Gerald CH Koh,[1] *MBBS, MMed*, *MGer*, Teck Yee Wong,[2] *MD, MMed, MPH*, Seng Kwing Cheong,[2] *MBBS, MMed, MPH*, Erle CH Lim,[2] *MBBS, MMed*, Raymond CS Seet,[2] *MBBS, MMed*, Wern Ee Tang,[3] *MBBS, MMed*, Chi Siong Chua,[4] *MBBS, MMed*

Abstract

Introduction: Previous studies on patient acceptance of medical student teaching were from Western populations and in one setting only. However, there has been no prospective study comparing patient acceptability before and after an actual experience. We studied patient acceptability of medical student teaching in private and public family practices and public hospital specialist outpatient clinics in Singapore, and before and after an actual medical student teaching consultation. Materials and Methods: We conducted an anonymous cross-sectional survey from March through October 2007 of Singaporean or permanent resident patients attending 76 teaching private family practices, 9 teaching public family practices and 8 specialty clinics in a teaching public hospital. We used pre-consultation cross-sectional patient surveys in all three settings. For private family practice setting only, post-consultation patient survey was conducted after an actual experience with medical student presence. Results: Out of 5123 patients, 4142 participated in the cross-sectional survey (80.9%) and 1235 of 1519 patients in the prospective cohort study (81.3%). Eighty percent were comfortable with medical students present, 79% being interviewed and 60% being examined. Regarding being examined by medical students, parents of children were least comfortable while patients between 41 to 60 years were most comfortable (adjusted OR = 1.99 [1.55-2.57]). Females were less comfortable with medical student teaching than males. Chinese patients were the least comfortable about being interviewed or examined by medical students among the ethnic groups. Indians were most comfortable with being interviewed by medical students (adjusted OR = 1.38 [1.02-1.86]) but Malays were the most comfortable being examined by them (adjusted OR = 1.32 [1.07-1.62]). Family practice patients were more receptive to medical student teaching than the hospital's specialist outpatients. Common barriers to patient acceptance were lack of assurance of patient privacy, dignity and confidentiality. Actual exposure to medical student teaching did not change levels of patient acceptance. Conclusions: Compared to similar studies from Western countries, Asian patients appear to be less receptive to medical student teaching than Western patients. Family practice settings offer medical students a more receptive learning environment.

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Introduction

In recent decades, medical advances and economic pressures have shifted medical student training from hospital inpatient to ambulatory settings such as hospital outpatient and primary care clinics.[1,2] Most studies have found that patients are agreeable to seeing medical students and value the opportunity to interact with them. However, these surveys were conducted in predominantly Caucasian populations and often were unable to examine whether specific ethnicities influenced patient participation in medical education because of small numbers from minority races.[3,4] Although there have been several studies on cultural

[1] Department of Epidemiology and Public Health, Yong Loo Lin School of Medicine, National University of Singapore
[2] Department of Medicine, National University Hospital, National University Health System
[3] National Healthcare Group Polyclinics, Singapore
[4] SingHealth Polyclinics, Singapore
Address for Correspondence: Dr Gerald CH Koh, #03-20, Block MD3, 16 Medical Drive, Department of Epidemiology and Public Health, Yong Loo Lin School of Medicine, National University of Singapore, National University Health System, Singapore 117597.
Email: Gerald_Koh@nuhs.com.sg

competency education in medical students[5,6] and resident preparedness to provide cross-cultural care,[7] there have been few studies on receptivity of ethnic minority patients to being involved in medical education.

Studies on patient attitudes to medical student participation during consultations have largely been limited to either specialist outpatient clinics (obstetrics and gynaecology,[8-10] emergency,[11,12] internal medicine,[4] dermatology[13] and otorhinolaryngology [ENT][14]) or community-based primary care clinics[3,15-20] only. These studies originated from countries such as US, Europe, Australia and Israel, but there has been no similar study from Asia. Only one study compared patient attitudes between hospital outpatient and community based ambulatory clinics and found no significant difference.[4] Previous studies on the effect of medical student teaching on patient satisfaction have been based on case-control methods, comparing between teaching and non-teaching groups.[21,22] However, there has been no prospective study comparing patient acceptability before and after an actual experience with medical student teaching.

We studied the patients' acceptability of medical student teaching in private and public family practices and hospital specialist outpatient clinics in Singapore, a multi-ethnic Asian country with Chinese, Indians and Malays forming the three main races, before and after consultations where medical students were actually present.

Materials and Methods

Survey Development

We developed a questionnaire based on findings from previous studies. We found from our literature review that patient comfort levels differed between students being interviewed and physically examined by medical students.[3,4,13] We also found that patients whose gender or ethnicity differed from the student's affected the patient's comfort. [4,8,18] Some studies also found that medical student teaching affected the quality and duration of consultation: some positively,[11,16,18] some negatively[15,20] or both.[17] Based on these findings, we formulated a questionnaire to measure these variables for our local population. The survey was divided into two parts: a pre-consultation survey and a post-consultation survey. We asked questions on patients' overall comfort with medical student presence and acceptability of medical students taking a history and performing a physical examination, both before and after an actual consultation with a medical student present. We identified common reasons why patients are either receptive or unreceptive to medical student presence by reviewing qualitative studies on community-based teaching.[23-27] We opted to ask these reasons in the post-consultation survey as we felt their replies would be more valid after an actual experience.

Survey Instrument

The pre-consultation survey contained 5 sets of questions: (1) 4 questions on socio-demographic questions that included age, gender, ethnicity and housing type (as a surrogate marker of socio-economic class); (2) 4 questions on patient's comfort with medical student teaching; (3) 3 questions on the effect of medical student teaching on quality and duration of consultation; (4) 2 questions on gender of student on patient's comfort with them interviewing or examining them and (5) a question on whether medical student teaching improved the patient's opinion of the doctor. We used a six point Likert scale for each question: strongly disagree, disagree, unsure but probably disagree, unsure but probably agree, agree, and strongly agree. The post-consultation survey contained another 4 sets of questions: (1) 2 questions on patient's satisfaction and comfort with consultation with medical student present; (2) 2 questions on why patient was comfortable or uncomfortable with medical student teaching; (3) 3 questions on patient perceptions on how medical student teaching affected duration of consultation and (4) 3 questions on patient's receptivity to medical student teaching in the future.

Study Population

We conducted an anonymous cross-sectional survey from March through October 2007 of Singaporean or permanent resident patients attending 76 teaching private family practices, 9 teaching public family practices (locally termed as 'polyclinics') and 8 specialty clinics in a teaching public (university) hospital. The 76 teaching private family practices and 9 teaching public family practices represent all teaching family practices in Singapore, as our medical school was the only one in Singapore at time of study. We did not survey private hospitals because they are not involved in medical student teaching in our local context. The pre-consultation survey was administered to all 3 groups but the post-consultation survey was only administered to the teaching private family practices group. We were unable to conduct the post-consultation survey in public family practices and specialty clinics because of logistic and scheduling limitations. The survey was self-administered and a single multi-lingual interpreter was used in each clinic for participants who were illiterate to standardise phrasing of questions. If the patient was below 21 years old, the parents or guardian was interviewed instead. Verbal consent was obtained from each participant after providing an explanation of the survey's purpose and assurance that their responses will be kept confidential. Ethics approval was obtained from the Institutional Review Boards of all institutions involved and consent was obtained from participating private general practitioners.

Survey Administration

The family medicine posting in our medical school consists of 2 weeks of student learning in private family practice and another 2 weeks in public family practice, and 3 postings were conducted during the study period. The survey in private family practices was conducted by pairs of medical students who were posted to a private family physician during their family medicine posting. One student remained outside and conducted the survey for the first half of a half-day session while the other remained inside with the family physician tutor, and they switched over in the second-half. The student outside the consultation room conducted the pre-consultation survey while patients were waiting and the post-consultation survey was conducted after the consultation. The pair of students was instructed not to pass any information on the survey forms to each other and patients were informed that the student present during their consultation would be blind to their survey results. For the survey in public family practices and public teaching hospitals, the pre-consultation survey was conducted by research assistants who were not medical students. In the public family practice setting, patients were systematically sampled (every third patient who registered at the clinic counter) and in the public teaching hospital setting, all patients attending a half-day session at a specialty clinic were surveyed. The public teaching hospital has 8 specialty clinics and all clinics were sampled. The specialties represented include paediatrics, internal medicine (e.g. cardiology, neurology, gastroenterology, oncology, etc), obstetrics and gynaecology, psychiatry, surgery, orthopaedics, ophthalmology and ENT. We were unable to ascertain which specialty patients were attending because a clinic may have several different specialties concurrently running.

Analysis

Data was entered directly and analysed using Statistical Programme for Social Sciences (Version 15.0). Independent double-checking was performed to maximise fidelity of data. For the pre-consultation survey, we dichotomised the scale into positive responses (strongly agree, agree, probably agree) and negative responses (strongly disagree, disagree, probably disagree). We used McNemar's test to evaluate differences in the proportions before and after consultation. With a sample size of 1252 and a *P* value of 0.05, the study

Table 1. Characteristics of Three Study Populations

Characteristic	**No. (%)***				
	Public Hospital (n = 1478)	**Public Family Practice (n = 1412)**	**Private Family Practice (n = 1252)**	**All (n = 4142)**	***P* value for $\chi 2$ test**
Age of patient (yrs)					
<21†	209 (14.2)	329 (23.3)	168 (13.5)	706 (17.2)	<0.001
21-40	509 (34.6)	539 (38.3)	619 (49.6)	1667 (40.3)	
41-60	580 (39.4)	394 (28.0)	381 (30.5)	1355 (32.8)	
>60	175 (11.9)	147 (10.4)	80 (6.4)	402 (9.7)	
Gender					
Male	753 (51.1)	717 (51.0)	569 (45.7)	2039 (49.4)	<0.001
Female	720 (48.9)	690 (49.0)	675 (54.3)	2085 (50.6)	
Ethnicity					
Chinese	990 (67.4)	871 (61.9)	872 (70.0)	2733 (66.3)	<0.001
Malay	240 (16.3)	263 (18.7)	163 (13.1)	666 (16.2)	
Indian	172 (11.7)	212 (15.1)	145 (11.6)	529 (12.8)	
Others	66 (4.5)	61 (4.3)	66 (5.3)	193 (4.7)	
Housing type					
1 to 3 room flat	272 (19.2)	369 (27.5)	161 (14.0)	802 (20.5)	<0.001
4 to 5 room flat	870 (61.4)	799 (59.6)	697 (60.6)	2366 (60.5)	
Condominium	164 (11.6)	97 (7.2)	156 (13.6)	417 (10.7)	
Landed property	112 (7.9)	75 (5.6)	137 (11.9)	324 (8.3)	

* Numbers may not add up because of missing data.

† The age of the parent/ward was not recorded.

Table 2. Crude Reponses by Clinic Setting

Statement	No. (%) Who Agree*				
	Public Hospital (n = 1478)	Public Family Practice (n = 1412)	Private Family Practice (n = 1252)	All (n = 4142)	*P* value for $\chi 2$ test
I am comfortable having medical students present during consultations	1136 (77.0)	1128 (79.9)	1047 (84.2)	3311 (80.2)	<0.001
I am comfortable with medical students interviewing me/my child or ward	1115 (75.6)	1132 (80.3)	1023 (82.0)	3270 (79.2)	<0.001
I am comfortable with medical students examining me/my child or ward	850 (57.9)	863 (61.4)	768 (61.5)	2481 (60.2)	0.083
I am comfortable with my doctor discussing my/my child or ward's history with medical students	1135 (77.2)	1104 (78.5)	1005 (80.3)	3244 (78.6)	0.131
Having medical students in the clinic improves the quality of my/my child or ward's consultation with my doctor	905 (61.7)	977 (69.2)	797 (63.7)	2679 (65.2)	<0.001
Having medical students in the clinic prolongs my/my child or ward's consultation time	982 (66.4)	1052 (74.5)	784 (62.6)	2818 (68.4)	<0.001
Having medical students in the clinic shortens my/my child or ward's consultation time	427 (29.1)	480 (34.2)	279 (22.3)	1186 (28.9)	<0.001
I would only allow medical students of the same gender to interview me/my child or ward	495 (33.7)	641 (45.6)	412 (32.9)	1548 (37.6)	<0.001
I would only allow medical students of the same gender to examine me/my child or ward	553 (37.7)	747 (53.2)	562 (45.4)	1862 (45.3)	<0.001
Having medical students in the clinic improves my impression of my/my child or ward's doctor	722 (49.1)	880 (62.5)	735 (59.1)	2337 (56.7)	<0.001

*Numbers may not correlate with percentages because the latter was based on valid responses

had 80% power to detect an 8% difference in an one-sample comparison of proportions between repeated measurement pre- and post-consultation. Multiple logistic regression was used to adjust odds ratios for all measured socio-demographic differences when determining independent associated factors of patient comfort with medical student teaching and when comparing across survey settings. All reported *P* values are two-tailed and statistical significance was set at $P \leq 0.05$.

Results

Participation Rates

Three private family practices declined to allow their patients to be surveyed. Of the remaining 73 private family practices who participated, 1252 out of 1519 eligible patients were surveyed (82.4%). Out of the 1252 patients who participated in the pre-consultation survey, 1235 patients completed the post-consultation survey (98.7%). There were no statistically significant differences in the demographic profile between the pre- and post-consultation groups. In the public family practice setting, 1412 out of 1756 eligible patients participated (80.4%), and in the public hospital setting, 1478 out of 1848 eligible patients participated (80.0%). A total of 4142 out of 5123 patients from all 3 ambulatory settings participated in the pre-consultation survey (80.9%) and 1235 out of 1519 patients from the private family practice setting participated in the before and after consultation study (81.3%).

Study Population Characteristics

Patients from the public hospital's specialist outpatient clinics were generally older while the public family practice had a large proportion of patients below 21 years old (Table 1). The private family practice group had the largest proportion of younger working age adults (age 21 to 40 years). The gender ratio was about equal except for the private family practice group which had a higher proportion of females. The public family practice group had the largest representation of minority ethnic groups (i.e. Malays and Indians) and 1 to 3 room flats. This is expected as public family practices in Singapore serve people from the lower socio-economic class who tend to be from the minority ethnic groups. Chi-square analysis between ethnicity and housing type showed that Malay and Indians were more likely to live in flats (which are government subsidised) than condominiums and landed property (P <0.001) (detailed

Table 3. Associations between Demographics and Comfort with Medical Student Teaching

Demographic	Patient Comfort with Medical Students					
	Being Present		Interviewing Them		Examining Them	
	Crude OR	Adjusted OR*	Crude OR	Adjusted OR*	Crude OR	Adjusted OR*
Age of patient (yrs)						
<21	1.00	1.00	1.00	1.00	1.00	1.00
21-40	1.15 (0.85-1.55)	1.21 (0.87-1.67)	1.00 (0.74-1.35)	1.14 (0.82-1.57)	1.85 (1.43-2.40) †	2.00 (1.51-2.65) †
41-60	1.02 (0.77-1.34)	1.13 (0.84-1.52)	1.08 (0.83-1.41)	1.25 (0.93-1.67)	1.79 (1.42-2.27) †	2.10 (1.63-2.71) †
>60	0.94 (0.71-1.24)	0.92 (0.68-1.24)	0.92 (0.70-1.21)	0.98 (0.73-1.32)	1.31 (1.03-1.70) †	1.33 (1.04-1.73) †
Gender						
Male	1.00	1.00	1.00	1.00	1.00	1.00
Female	0.68 (0.58-0.79) †	0.67 (0.57-0.79) †	0.78 (0.67-0.91) †	0.74 (0.63-0.88) †	0.64 (0.57-0.73) †	0.64 (0.56-0.73) †
Ethnicity						
Chinese	1.00	1.00	1.00	1.00	1.00	1.00
Malay	0.82 (0.65-1.02)	0.81 (0.64-1.03)	1.23 (0.97-1.56)	1.25 (0.97-1.62)	1.34 (1.11-1.64) †	1.31 (1.07-1.62) †
Indian	0.96 (0.73-1.27)	0.92 (0.68-1.23)	1.34 (1.02-1.81) †	1.35 (1.00-1.83)	1.13 (0.89-1.44)	1.04 (0.81-1.34)
Housing type						
1 to 3 room flat	1.00	1.00	1.00	1.00	1.00	1.00
4 to 5 room flat	1.02 (0.78-1.52)	0.94 (0.67-1.34)	1.14 (0.84-1.55)	1.00 (0.72- 1.39)	0.73 (0.56-0.94) †	0.69 (0.52-0.92) †
Condominium	0.94 (0.70-1.26)	0.86 (0.63-1.17)	0.85 (0.64-1.13)	0.75 (0.56-1.01)	0.73 (0.58-0.93) †	0.70 (0.55-0.90) †
Landed property	1.24 (0.87-1.77)	1.20 (0.82-1.75)	1.02 (0.71-1.44)	0.97 (0.67- 1.40)	1.02 (0.76-1.36)	0.99 (0.72-1.35)

* Adjusted for study setting and the other 3 demographic variables.
† P <0.05.

results not shown).

Pre-consultation Survey

Unadjusted raw responses from the pre-consultation survey are detailed in Table 2. Overall, 80.2% of all patients were comfortable with medical student presence during consultations. Generally, across all groups, four-fifths of patients were receptive to medical students interviewing them or their doctors discussing their history with medical students. However, when medical teaching involved physical examination, patients were less receptive: 79.2% of all patients were comfortable with medical students interviewing them, but only 60.2% were comfortable with medical student examining them. Nevertheless, about two-thirds of all patients (65.2%) felt that medical student teaching improved quality of consultations. The majority (68.4%) felt that medical student teaching prolonged the duration of consultations but 28.9% felt that it was shortened. Of all patients, 37.6% would only allow medical students of the same gender to interview them and a higher 45.3% would only allow those of the same gender to examine them. More than half (56.7%) felt that medical student teaching improved their impression of their attending doctor.

There were no associations between age and patient comfort with medical student presence or interviewing them, but parents were least comfortable about their children being examined by medical students and patients between 41 to 60 years were most comfortable about being examined by medical students (adjusted OR = 1.99 [1.55-2.57]) (Table 3). Females were less comfortable with medical students present (adjusted OR = 0.68 [0.58-0.81]), interviewing them (adjusted OR = 0.76 [0.65-0.89]) and examining them (adjusted OR = 0.65 [0.57-0.74]) than male patients. Chinese patients were the least comfortable about being interviewed or examined by medical students among the ethnic groups. Indians were most comfortable with being interviewed by medical students (adjusted OR = 1.38 [1.02-1.86]) but Malays were the most comfortable being examined by them (adjusted OR = 1.32 [1.07-1.62]). Patients from 4 to 5 room flats (adjusted OR = 0.72 [0.54-0.95]) or condominiums (adjusted OR = 0.73 [0.58-0.93]) were less likely to allow medical students to examine them than those from 1 to 3 room flats. Female patients were less likely to allow medical students of the opposite gender to interview them (adjusted OR = 0.7 [0.6-0.8]) and even less likely to examine them (adjusted OR = 0.5 [0.4-0.6]) than male patients (detailed results not shown).

As the patient demographic profile of the 3 settings was

Table 4. Adjusted Reponses by Clinic Setting

Statement	Adjusted Odds Ratios (95%CI) of Those Who Agree*		
	Public Hospital (n = 1478)	Public Family Practice (n = 1412)	Private Family Practice (n = 1252)
I am comfortable having medical students present during consultations	1.00	1.25 (1.03-1.52)	1.66 (1.35-2.04)
I am comfortable with medical students interviewing me/my child or ward	1.00	1.33 (1.10-1.61)	1.57 (1.29-1.92)
I am comfortable with medical students examining me/my child or ward	1.00	1.18 (1.00-1.18)	1.37 (1.16-1.61)
I am comfortable with my doctor discussing my/my child or ward's history with medical students	1.00	1.14 (0.94-1.38)†	1.25 (1.02-1.53)
Having medical students in the clinic improves the quality of my/my child or ward's consultation with my doctor	1.00	1.31 (1.11-1.55)	1.22 (1.03-1.44)
I would only allow medical students of the same gender to interview me/my child or ward	1.00	1.57 (1.33-1.84)	1.00 (0.85-1.19)†
I would only allow medical students of the same gender to examine me/my child or ward	1.00	1.70 (1.45-1.99)	1.32 (1.12-1.56)
Having medical students in the clinic improves my impression of my/my child or ward's doctor	1.00	1.60 (1.37-1.88)	1.60 (1.36-1.88)

* Adjusted for age, gender, ethnicity and housing type.
† $P > 0.05$.

different, the responses were adjusted accordingly using the public hospital group as reference to allow comparison of responses between settings (Table 4). Generally, patients from private family practice were the most comfortable with medical student presence and involvement in history-taking and physical examination, followed by patients from public family practice, then specialist outpatient clinics. Patients from private family practice were most comfortable with their doctor discussing their history with medical students than the other two settings. Family practice patients were more likely to feel that medical student teaching improved the quality of consultation than specialist outpatient clinics. Public family practice patients are most likely to feel that medical student teaching prolongs consultation and private family practice patients are least likely to feel it shortens consultation. Patients from public family practice were most likely to feel that gender of the medical student was an issue. Family practice patients were more likely to have a positive impression of the attending physician because of medical student teaching than hospital specialist outpatients.

Post-consultation Survey

The majority of patients who had a medical student present were satisfied with their consultation (97.6%) and comfortable with their presence (86.4%) (Table 5). Nevertheless, 38.3% wanted additional time alone with their doctor. Only 39.8% of patients felt that consultation time was affected by medical student teaching. Of this group, the majority (76.4%) felt that it prolonged consultation time. Of those who were in favour of medical students interviewing, examining or counselling them, they were

Table 5. Reponses from Post-consultation Survey (Private Family Practice Patients Only) (n = 1235)

Question	No. (%)*
How satisfied are you with today's consultation?	
Satisfied	1204 (97.6)
Not satisfied	30 (2.4)
Generally, were you comfortable with medical students present?	
Yes	1053 (86.4)
No	166 (13.6)
Did you want more time alone with the doctor?	
Yes	458 (38.3)
No	738 (61.7)
Are you in favour of allowing medical students to be present during consultations in the future?	
Yes	990 (84.0)
No	189 (15.1)
Would you allow medical students to interview you/your child or ward in the future?	
Yes	865 (85.7)
No	146 (14.3)
Would you allow medical students to examine you/your child or ward in the future?	
Yes	637 (65.4)
No	337 (34.6)

*Numbers may not add up to 1235 because of missing data.

Table 6. Reasons Why Patients were Comfortable or Not Comfortable with Medical Student Present (Private Family Practice Patients Only) (n = 1235)

Reasons Why Patients Were Comfortable with Medical Students Present (number who selected ≥1 response = 1053)	**No. (%)***
You are supportive of training of medical students	598 (56.8)
Better explanation given by doctor	311 (29.5)
You were not worried about being embarrassed	274 (26.0)
You managed to say what you wanted to say	246 (23.4)
You felt your privacy was assured	183 (17.4)
Your problems were dealt in greater detail	179 (17.0)
You felt the confidentiality of your consultation was assured	161 (15.3)
Better history-taking by doctor	151 (14.3)
More time spent during your consultation than expected	134 (12.7)
Better physical examination given by doctor	132 (12.5)
Felt less anxious with a student present	66 (6.3)
Less time spent during your consultation than expected	32 (3.0)
Others	102 (9.7)
Reasons Why Patients Were Uncomfortable with Medical Students Present (number who selected ≥1 response = 166)	**No. (%)***
You felt your privacy was not assured	118 (71.1)
Felt more anxious with a student present	108 (65.1)
You were worried about being embarrassed	103 (62.0)
You felt the confidentiality of your consultation was not assured	58 (34.9)
More time spent during your consultation than expected	55 (33.1)
Less time spent during your consultation than expected	25 (15.1)
Your problems were dealt in lesser detail	17 (10.2)
You did not get to say what you wanted to say	14 (8.4)
Poorer explanation given by doctor	12 (7.2)
Poorer history-taking by doctor	10 (6.0)
You are not supportive of training of medical students	9 (5.4)
Poorer physical examination given by doctor	8 (4.8)
Others	14 (8.4)

* Percentages do not add up to 100% because multiple responses were allowed.

divided as to whether they would allow these activities to be done before or after seeing their attending physician. Of those who were comfortable with medical students present, the two most common reasons were because they were supportive of medical student training (56.8%) and felt that their doctor's explanation of their medical condition was better (29.5%) (Table 6). Of those who were not comfortable with medical students present, the four most common reasons were because they felt their privacy was not assured (71.1%), felt more anxious with them present (65.1%), were worried about being embarrassed (62.0%) and felt the confidentiality of their consultation was not assured (34.9%).

Comparing Responses Before and After Medical Student Teaching

Patients' comfort with medical student presence did not change after an actual experience (OR = 1.07 [0.79-1.45]) (Table 7). There was also no change in comfort levels with medical students interviewing (OR = 1.05 [0.77-1.42]) or examining them (OR = 1.17 [0.89-1.54]) after an actual experience.

Discussion

Most previous studies on patient acceptance of medical student teaching were done either in specialist outpatient or general practice settings only. We found 2 studies that surveyed both settings: 1 from UK and another from US. The UK study reported that 91% of patients would allow medical students to talk to them about their condition[3] whereas only 79% of our subjects felt the same. The US study reported only mean scores based on a 5-point Likert Scale which made comparisons not possible.[4] Patient acceptability of medical students in general practice settings were reported to be generally high. Bentham et al[16] reported that 98% of UK general practice patients experienced no disadvantage in seeing students and Cooke et al[18] reported that only 8.3% of UK patients had negative feelings about having medical students present during general practice consultations. In Australia, 90.4% of general practice patients consented to having medical students present during a consultation[19] and only 3.2% of Israeli family practice patients were unhappy for a student to be present during their consultation.[20] These studies are in contrast to our patients where only 80% to 84% of family practice patients were comfortable with medical student presence. It would be inappropriate to compare our specialist outpatient clinic findings to other studies as almost all were only done within a single specialty clinic. Nevertheless, the reported proportions of patient acceptability of medical teaching suggest differences. In an emergency department in Ireland, Kuan and O'Donnell[11] reported that 82% of patients were receptive to medical students examining them, whereas only 57.6% of our patients were comfortable about this. In a conservative society like the United Arab Emirates, 87.1% of women in an outpatient obstetric and gynaecologic clinic still accepted medical student involvement in their care.[8] Overall, Asian patients appear less accepting of medical student teaching

Table 7. Comparison between Pre- and Post-consultation Responses (Private Family Practice Patients Only) (n = 1235)

Comfort with Medical Students Present

		Post-consultation (Are you in favour of allowing medical students to be present during consultations in the future?)		Total
		Yes	No	
Pre-Consultation (I am comfortable having medical students present during consultations)	**Agree**	900 (90.7%)	92 (9.3%)	992 (84.5%)
	Disagree	86 (47.3%)	96 (52.7%)	182 (15.5%)
Total		986 (84.0%)	188 (16.0%)	1174 (100%)

OR (95%CI) = 1.07 (0.79-1.45)

Medical Student Interviewing Patient

		Post-consultation (Would you allow medical students to interview you/ your child or ward in the future?)		Total
		Yes	No	
Pre-consultation (I am comfortable with medical students interviewing me/my child or ward)	**Agree**	777 (89.6%)	90 (10.4%)	867 (86.1%)
	Disagree	86 (61.4%)	54 (38.6%)	140 (13.9%)
Total		863 (85.7%)	144 (14.3%)	1007 (100%)

OR (95% CI) = 1.05 (0.77-1.42)

Medical Student Examining Patient

		Post-Consultation (Would you allow medical students to examine you/ your child or ward in the future?)		Total
		Yes	No	
Pre-consultation (I am comfortable with medical students examining me/ my child or ward)	**Agree**	535 (81.9%)	118 (18.1%)	653 (67.2%)
	Disagree	101 (31.7%)	218 (68.3%)	319 (32.8%)
Total		636 (85.7%)	336 (14.3%)	972 (100%)

OR (95% CI) = 1.17 (0.89-1.54)

Numbers may not add up to 1235 because of missing data.

in ambulatory settings compared to other populations. Even among Asian patients, we found differences between Chinese, Indians and Malays with regards to receptivity to being interviewed and examined by medical students. With Asians being the fastest growing ethnic group among patients in the US[28] and UK,[29] our study also has implications for physician teachers and medical students from these countries who will care for increasing numbers of patients from Asian backgrounds in the course of their careers.[30] Sensitivity to the social and cultural norms and practices within Asian populations and sub-populations needs to be emphasised during medical student training. Greater efforts are probably needed to address the concerns of Asian patients regarding privacy, dignity and confidentiality when involving them in physician training.

Most studies have found an association between older age and greater patient acceptance[8,14] but ours is the first to include parents of patients below age of consent and find age differences only with physical examination by medical students. Chipp et al[3] also found that females were less participative in medical student education and preferred to see a student of the same gender. There has been controversy over whether social status affects patient acceptability of medical student teaching:[31] A study in ambulatory care found that medical insurance type had no effect on student acceptability by patients,[15] while another in a hospital setting found that patients from a lower social class tend to have more positive attitudes about student involvement in their care.[32] Our finding was interesting in that we found patients from the extreme levels of housing (i.e. 1 to 3 room flats or landed property) were more comfortable with medical student teaching than those from middle levels (i.e. 4 to 5 room flats and condominiums).

With family practice patients being more receptive to

medical student teaching than specialist outpatients, there is another reason for hospital-centric medical school curricula to move towards community-based student training. Family practices are often under-utilised as a training centre resource in many medical schools and may offer a more conducive environment for medical students to assess clinical teaching opportunities. A possible reason why family practice patients were more receptive to medical students could be because they often already have a close long-term relationship with their family physician and hence, feel more confident that their privacy and confidentiality would be assured. As we had only asked the public family practice group for reasons why they were not comfortable with medical students present, we are unable to verify this hypothesis.

The finding that there was no change in patient comfort levels with medical student teaching after an actual experience supports other studies which found that past contact with medical students had no effect on patient acceptability[3,11] or satisfaction.[21,22] This is in contrast to the study by Rizk et al[8] which found that previous teaching encounters were associated with greater medical student acceptance in a cross-sectional study.

The most common reasons and barriers to patient receptivity of medical student teaching in our study were similar to those expressed by family practice patients in qualitative studies.[27,28] In the paper by Coleman and Murray,[27] altruism and personal gain such as improved knowledge were identified as the two main reasons why patients were positive about patient involvement in medical student teaching. Patient anxiety and insufficient assurance of patient confidentiality as barriers to patient receptivity to medical student presence were also identified in other studies.[19,30] Possible solutions to address these barriers could be for doctors to better prepare their patients by obtaining their consent to medical student teaching before the consultation (e.g. upon making an appointment or registration), assuring them that all information discussed will be kept confidential and reminding them that they have the option to ask medical students to leave halfway through the consultation if they change their minds. Such considerations will be especially important if the patient is female or from an ethnic minority group.

Limitations and Strengths

Although Singapore is a multi-ethnic country in Southeast Asia, most of its people belong to second or third post-immigration generations and do not represent Asians of their motherlands (e.g. China, India) or the whole of Asia. As we did not ask participants if they had a previous experience with medical student teaching (whether positive or negative), we were not able to study its effects on outcomes. It would have been ideal to have had a control group of Caucasian or non-Asian patients but we would have encountered similar problems of inadequate numbers for comparison faced by Western studies. A major limitation inherent to the logistic constraints of the pre- and post-consultation study was that activities performed by the medical student during public family practice consultation were not standardised. However, this would be have had been logistically challenging. It would also have been ideal to have done the pre and post consultation study in public family practice and hospital settings as well for comparison.

Despite these limitations, this study has also several strengths. To our knowledge, this is the first study on patient acceptance of medical student teaching based on a large sample of Asian patients, comparing between public versus private and family practice versus hospital settings, and determining the effect of an actual consultation with medical student teaching on patient acceptability using a prospective cohort study design.

Conclusion

Asian patients appear to be less receptive to medical student teaching than their Western counterparts. Among Asian patients, females and the Chinese are least comfortable with medical students interviewing and examining them. Indians were most comfortable with being interviewed by medical students and Malays were the most comfortable being examined by them. Parents of children and those from middle levels of housing are least receptive to medical students examining them. Private and public family practice patients were more receptive to medical students than hospital's specialist outpatients, which supports greater medical student teaching in the community. In a private family practice setting, actual exposure to medical student teaching did not affect levels of patient acceptance. To improve patient acceptability of medical student teaching, we should focus on assuring patients of their privacy, dignity and confidentiality.

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