

Patient Attitudes Regarding Medical Student Involvement in a Primary Care Setting

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Scott Kaser
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Mentor: Andrew Carroll, MD, FAAFP

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Abstract

Previous studies on patient comfort with medical student involvement have consistently reported positive or neutral results within multiple specialties. The objective of this study was to examine patient attitudes toward medical students in a private family practice setting. This study also looked to examine whether recent medical student interaction alters patient attitude and if patient attitude can be improved with the prospect of providing feedback. It was hypothesized that there would be a positive pre-to-post test change in patient attitudes and that patients would respond positively to the prospect of providing feedback.

Ninety-nine consecutive consenting adult patients completed a self-administered questionnaire before and after their office visit, which included a medical student interaction. Patient demographics (age, gender, race, prior student exposure, # years with doctor) as well as their attitudes toward the involvement of medical students were recorded. Data were collected for 10 months at Renaissance Medical Group, a private family practice with one physician provider. Data were compiled in Excel and analyzed with STATA12. Paired two-tailed T-tests and ANOVA were used to determine statistical significance.

The results demonstrated that, prior to medical student interaction on 8 of 9 measures, patients have positive attitudes toward medical students. After medical student interaction, on 7 of 9 measures, respondents changed their response to a more positive position ($P \leq 0.05$). In addition, patients demonstrated a willingness to provide feedback to the medical student, but providing this feedback would not significantly alter their patient care experience. There were also statistically significant demographic differences on specific measures.

This study provides evidence that patients respond positively to medical student interaction in the private Family Medicine setting. This study also demonstrates areas in which the patient care experience can be improved and provides the basis for further study on the patient - medical student interaction.

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Introduction and Significance

Background

Medical student education requires extensive clinical exposure and frequent interaction with real patients. This clinical training is essential to medical education; however, patients may not directly benefit from the involvement of medical students in their care. In addition, patients may have various feelings or misgivings towards student involvement with their healthcare.

Many studies have been conducted to examine patient attitudes towards student involvement in their care in various medical specialties, including General Practice, Surgery, Obstetrics/Gynecology, Dermatology, Ambulatory Care, Internal Medicine, and Genitourinary Medicine (Passaperuma et al 2008). The results of these studies consistently demonstrated that patients, overall, have a positive or neutral attitude toward students. However, some interesting trends have been illuminated: a minority of patients do not desire medical student participation, older men are more receptive to medical students (Simons et al. 1995), and patients have a gender preference in some settings, examinations, and procedures (Adams et al 1999, Shah-Khan 2007, Passaperuma et al 2008).

In the United States, medical sub-specialties, particularly Obstetrics/Gynecology, have been the focus of research on patient perceptions, as these settings frequently require potentially invasive and/or uncomfortable examinations/procedures. Patient attitudes toward medical student involvement in healthcare has been extensively studied in the general practitioner setting in the United Kingdom, but few studies in the family practice setting have been performed here in the US. In two of the most recent and complete US studies in Family Medicine, the majority of patients had positive perceptions about their participation in medical student education (Prislin MD et al. 2001, Devera-Sales A et al. 1999).

Study Goals

In reviewing the existing literature, two gaps in knowledge are apparent. First, past studies have failed to assess if medical student encounters are reinforcing or altering the pre-exam patient attitude. Previous studies either failed to report when the survey instrument was given or implied that the survey was given post-encounter. Interaction with a medical student

and subsequently an attending should serve to improve patient attitudes toward medical student involvement. A significant change toward a negative attitude post-experience would be an alarming trend and should be examined with additional research. This research will attempt to evaluate if such a trend exists by attempting to answer the question; does an acute medical student encounter have significant impact on a patient's attitude toward medical student involvement in their healthcare?

Second, past studies have failed to consider the use of patient feedback to augment student education. In the simulated or OSCE setting, patient actors provide direct feedback to students. In clinical care, there is no standardized feedback method. If patients feel they are more involved in the student's education, they might have a more positive outlook on their clinical experience with the student. This study will not allow patients the ability to provide feedback or look at whether this feedback is useful, etc. Instead, the study will seek to assess a patient's change in attitude, if the opportunity to provide student feedback were made available. If patients believe that their experience will be better, based upon the potential to provide medical student feedback, then maybe this opportunity should be offered in the clinical setting, as opposed to just the simulated one. This may serve to benefit the student and the patient. Thus, this research will attempt to answer the question; does the prospect of providing written feedback affect a patient's attitude toward medical student involvement in their healthcare?

In addition to seeking to answer these two questions, the research will need to explore the attitudes patients have toward medical students prior to any medical student intervention. This will provide a basis of comparison with other studies. This research will include a similar survey instrument, with similar attitude and demographic questions, as compared to prior studies. These questions will serve as a baseline for assessment in this study and allow study comparison in the discussion.

The setting of this research will also provide a unique opportunity to gain perspective from patients who receive their primary health care from a private operating physician. Prior studies had been conducted in academic settings, where patients and students more commonly interacted and where resident physicians were present.

Study Hypothesis

It is the belief of the investigators that the initial pre-interaction measures in this study regarding patient attitudes toward medical students will not be significantly different from those in past studies. On the majority or all of the measures it is the hypothesis of the investigators that patients have neutral to positive attitudes toward medical student involvement in their care.

In regards to the pre-to-post exam patient attitudes, it is hypothesized that there will, overall, be a positive pre-to-post test change in patient attitudes. In addition, it is hypothesized that, overall, patients will respond positively to the prospect of providing feedback. It is hypothesized that patients will significantly agree that the prospect of providing feedback will improve their patient care experience.

Looking at demographic breakdown, it is believed that patients with prior medical student experience, who have received care longer from the provider, who are older in age, and who are male, will initially have more positive attitudes toward medical students. However, it is believed that their acute pre-to-post medical student interaction scores will not be as significantly positive. Inversely, it is believed that younger female patients, who have had less medical student experience, and who have received care for less than a year from the provider, will initially have more neutral attitudes toward medical students. And along the same lines, it is believed that their acute pre-to-post medical student interaction scores will be more significantly positive. These predictions follow the observations made in some prior studies (Simons et al. 1995, Passaperuma et al 2008).

Impact

Family Medicine is the portal of entry to the health care system. As of 2004, Family Medicine was second in size, only to Internal Medicine, and to this day makes significant contribution to patient care and medical education (Jimbo 2004). Therefore, further research on patient perspectives toward medical students in the family practice setting is essential.

Independent studies found that patients consent to medical student involvement with altruistic intent (Hartz & Beal 2000, Chipp et al. 2004, Haffling AC & Hakansson A 2008). As the healthcare system changes, putting increasing strains on patients, practitioners, and students, it

is important that patients maintain this willingness and desire to participate in medical student education, particularly in the Family Medicine setting. Thus, this research needs to be conducted to assess the current state of the student-patient relationship and how it can be maintained or improved in the future.

Research Materials and Methods

Overall Study Design

The study was conducted over a period of 10 months that collected data from consenting adult patients. Patients completed a self-administered questionnaire before and after their office visit, which included a medical student interaction. The original study design called for 300 surveys to be collected to provide increased statistical power and supersede the data points obtained in similar prior studies.

Setting and Patient Population

The research was conducted at Renaissance Medical Group located at 333 N Dobson Rd Suite 15, Chandler, AZ 85224. Renaissance Medical Group is a small private family practice run by Dr. Andrew Carroll, MD. Renaissance Medical Group is affiliated with the University of Arizona College of Medicine Phoenix Family Clerkship program for 3rd year medical students and Longitudinal Clinical Experience for 1st and 2nd year medical students. This site was chosen because Renaissance Medical Group is a private family practice where medical students rotate, but residents do not. The study investigators wanted to evaluate medical student intervention in a private family practice setting independent of resident intervention. Medical students from the University of Arizona at various stages in their medical school education rotate through Renaissance Medical Group. At any given time during office hours, there are two administrative assistants at the front desk, two nurses in the clinical area, zero to three medical students, and Dr. Andrew Carroll MD. Approximately 20-30 patients are seen daily.

Every patient, over 18, with an appointment during the time a medical student was present in the office was considered a suitable subject. A medical student was present approximately 50 full days during the course of the 10-month study. Thus, it was estimated if a medical student saw 10 patients a day, 500 patients would be available for recruitment.

Study Instrument

The study instrument was a self-administered survey that was completed by patients in the waiting room of Renaissance Medical Group. The survey consisted of 12 questions that explored patients' perceptions toward medical students. The survey included demographic,

pre-exam attitude, and post-exam attitude questions. The survey utilized in the study can be found in Appendix A.

The survey was designed to include questions that specifically answer the study goals. All of the questions utilized in the survey, both attitude and demographic questions, were selected from various study instruments used in prior studies. These studies can be found in the references section. The survey was also designed to meet IRB exemption by avoiding the collection of patient identifiable data and health information. The specific survey utilized in this study has not been used in prior studies. Due to time constraints, it was not piloted. However, Dr. Joan Rankin Shapiro, Associate Dean for Research, and Rachel Langhofer, Senior Research Coordinator, from The University of Arizona - College of Medicine, reviewed the survey.

As in prior studies, this study's survey utilized the Likert scale to provide objective measurement to patient attitude. Statements in the survey that used the five-point Likert scale were all worded in a positive manner, so that a higher score indicated a more positive attitude. Cohen et al. (1996) found that using negative statements may result in patients overestimating their level of satisfaction. This questioning method was also utilized in Passaperuma et al. (2008). Other prior US studies have used positively and negatively worded questions.

Survey Administration

In most student-patient encounters at Renaissance Medical Group, medical students directly obtain consent to interview and examine a patient. In addition, students conduct this interview and examination before the attending has any contact with the patient. In two similar US studies (Prislin MD et al. 2001, Devera-Sales A et al. 1999), it was not made clear whether medical students saw the patient alone or obtained patient permission, prior to seeing the attending. Positive patient perspectives were demonstrated in studies performed in Sweden and the UK, where medical students saw the patients alone before patients saw their general practitioner (Bentham J et al. 1999, Haffling AC & Hakansson A 2008). In order to assess change in attitudes toward medical students immediately following an encounter, patients were given the survey in the waiting room prior to the encounter. They were instructed to fill out the first half of the survey at this time. After the office visit, patients were instructed (via the survey) to complete and submit the survey anonymously. The survey required 5 to 10 minutes to

complete and the subjects were not offered compensation for their participation. A drop box was used for survey return. Data collection occurred during normal business hours.

Every patient, over the age of 18, with a physician appointment at Renaissance Medical Group when a medical student was present in the office was supplied with a Recruitment Letter (See Appendix B) and Survey. The administrative assistant at the front desk of the office distributed this packet. Their role was to pass out the study packet, ensure that participation was voluntary, and direct questions to the researchers via phone/email. Dr. Carroll, who was onsite during data collection, supervised them. The distributor of these materials was instructed to do the following:

- 1) Ask the patient, "Would you be interested in taking part in a voluntary research study exploring patient attitudes toward medical students?"
- 2) If the response was "no," place a blank packet into the survey return box
- 3) If the response was "yes," distribute a packet to the subject and say, "All of the study information and material is located in this packet. Please read over everything thoroughly. If you would like to participate, please complete the survey."

The purpose of retaining a blank survey, if the patient chose not to participate, was to provide the necessary means to calculate the response rate. Estimating a response rate of 60%, the originally desired data return of 300 surveys would have been obtained. As discussed only 99, surveys were collected. Possible reasons for this discrepancy will be discussed in the Discussion section.

Ethical Research Practice

As this study utilized human subjects in an interview format, an IRB approval was required. As this study did not collect patient identifiable data or health information, it was deemed by the IRB to be exempt. See Appendix D.

In accordance with IRB, prior to the start of the study, a brief meeting was held to discuss the few added responsibilities of the staff. An instructional sheet was posted on site, see Appendix C. Dr. Carroll was present to ensure that all persons assisting with the study were adequately informed about the protocol, and their study-related duties and functions should their have been any confusion.

The data from the completed surveys remain under the care of Scott Kaser and Dr. Carroll, in case further research is warranted.

Funding and Outside Interests Related to Research

This study is financially unsponsored. Scott Kaser was the only funding contributor with a total budget under 100 dollars, used only for administrative supplies. No research participant was compensated. The investigators and their relatives do not have an outside interest in the sponsor of this research or any other entity or asset of potential monetary value that is or may appear to be related to this research.

Data Analysis

Surveys were assigned consecutive numbers (starting with 1) upon receipt, for bookkeeping purposes. Data were recorded using an Excel spreadsheet. STATA 12 was used to perform the statistical computations. Figures and Graphs were generated using Microsoft Excel.

Analysis was subdivided into three research objectives:

- 1) Research Objective 1 was to determine the pre-medical student interaction attitudes and if there is demographic variance in these attitudes. Mean scores for the patient's level of agreement with the statements were calculated and reported with their 95% confidence intervals. The difference between mean scores and the hypothesis of neutral attitude (Likert score of 3) was assessed using two-tailed t-tests. Differences in mean scores for each statement as compared to the demographics was assessed using one-way ANOVA.
- 2) Research Objective 2 was to determine the overall patient perspective on the medical student experience and determine if patients want to provide feedback. Again, also looking for demographic variance. Mean scores for the patient's level of agreement with the statements were calculated and reported with their 95% confidence intervals. The difference between mean scores and the hypothesis of positive attitude (Likert score of 4) was assessed using two-tailed t-tests. Differences in mean scores for each statement as compared to the demographics was assessed using one-way ANOVA.
- 3) Finally, Research Objective 3 was to determine pre-to-post interaction change in patient attitudes. Differences in pre-exam and post-exam mean scores were assessed using paired two-

tailed t-tests. In order to assess the difference between pre-exam and post-exam scores, as compared to the demographics, the difference between each pre-exam and post-exam score was computed first. This delta value for each statement as compared to the demographics was assessed using one-way ANOVA.

The level of significance was defined as $P < 0.05$. A sample size of 300 provided a power of 80% with $p = 0.05$, $\mu(\text{delta}) = 0.13$, and $\sigma = 0.8$.

Exclusion Criteria and Data Modification

To determine if a respondent had already completed the survey, the survey included a question that asked whether or not the respondent had already completed the survey. Of the 99 respondents, 1 respondent checked “yes” to this question and this survey was removed from all data analysis. This reduced the total usable number of surveys for data to 98.

Selected surveys had to be excluded from specific analysis due to certain constraints. Prior to specific exclusion, each Research Objective analysis started with the 98 usable data sets. For Research Objective 1, 2 surveys were removed from analysis for complete lack of pre-interaction data points (i.e. did not answer question 7). For Research Objectives 2 and 3, 3 surveys were removed from analysis for failing to mark “yes” in either question 8 and 9, or answering “no” to question 8. In failing to correctly answer these questions, it could not be determined if the respondent actually interacted with a medical student. For Research Objective 2 (which is an analysis of question 11), 8 surveys were removed from analysis for failing to answer question 11. For Research Objective 3 (which looks at the pre-post interaction change), 2 surveys were removed from analysis for complete lack of pre-interaction data points (i.e. did not answer question 7), and 5 surveys were removed from analysis for complete lack of post-interaction data points (i.e. did not answer question 10).

Surveys were included in all analyses if the respondent failed to answer one of the demographic questions (1 survey) or failed to answer up to 2 pre or post interaction questions (6 surveys).

One modification was made to the data set. One survey respondent selected multiple options under racial identification (“White”, “Hispanic”, “Asian”). The response was changed to “Other” for ease of data manipulation.

Results

Data were collected from 99 consecutive adult patients over a 10-month period. The goal of 300 participants was not reached. The results are presented independently in relation to each research objective (1 through 3). They are presented in this way, because each has a slightly different demographic breakdown, due to varied exclusion criteria. Additional detail on the exclusion criteria is provided above. Written comments from the respondents were recorded, but not analyzed. These written comments can be found in Appendix F.

Research Objective 1

The exclusion criteria allowed for the greatest number of survey utilization in Research Objective 1. Of the returned surveys, 96 were usable. Demographic breakdown by age is nearly uniform ranging from 13.5% to 24% (or 13 to 23 respondents) in each of the 5 categorical age groups. There were slightly more male respondents at 57.3% (55 respondents) vs. females at 42.7% (41 respondents). Respondents more strongly identified themselves as White or Caucasian at 78.1% (75 of 96). The second largest identified race was Hispanic or Latino at 14.6% (14 respondents). Only 7.2% identified themselves as Black or African American, Asian or Pacific Islander, or as Other. No one identified as American Indian or Alaska Native. As hypothesized in a private practice setting, the majority of respondents had not had prior medical student involvement in their care (62.5%). The majority of patients also had been receiving care at Renaissance Medical Group for 1 to 5 years (53.7%). A greater majority, 76.3%, had received care at Renaissance Medical Group for greater than 1 year. Refer to Table 1.1.

The purpose of Research Objective 1 was to determine the pre-exam medical student (MS) interaction attitudes and demographic variance in these attitudes. The mean response scores for each attitude question overall and by demographic are displayed in Tables 1.2.1 and 1.2.2. Patients had mean Likert scores of 4 or above on 4 of 9 attitudes (Comfort with MS of Opposite Gender, Comfort with MS of Different Race, MS Involvement Would Not Interfere With Doctor Relationship, and Clinical Teaching is Important for MS Education). At 2.88, the lowest mean score was for the patient attitude that medical student involvement would shorten visit time. The remaining attitude mean scores were 3.10 or above.

Table 1.1 – Overall Patient Demographics for Research Objective 1

Characteristic	No. Patients	%
Total	96	
Age		
18-34	23	24.0
35-44	23	24.0
45-54	17	17.7
55-64	20	20.8
>65	13	13.5
Gender		
Female	41	42.7
Male	55	57.3
Race		
White or Caucasian	75	78.1
Black or African American	1	1.0
Hispanic or Latino	14	14.6
American Indian or Alaska Native	0	0
Asian or Pacific Islander	4	4.2
Other	2	2.1
Prior Medical Student Involvement in Care		
Yes	36	37.5
No	60	62.5
Length of Time at Renaissance Medical Group		
0 – First Visit	2	2.1
< 1 year	11	11.6
1 – 5 years	51	53.7
> 5 years	31	32.6

Table 1.2.1 – Patient Demographics by Pre-Exam Patient Attitudes, Overall

	Question	Comfort with MS of Opposite Gender	Comfort with MS of Different Race	Comfort Providing MS with Personal Information	MS Involvement Would Improve Quality of Care
Characteristic	Overall	4.22	4.28	3.94	3.30
Age					
18-34		4.39	4.65	4.09	3.43
35-44		4.09	4.09	3.87	3.30
45-54		4.24	4.35	3.65	3.18
55-64		4.20	4.10	4.00	3.30
>65		4.15	4.15	4.08	3.23
Gender					
Female		4.20	4.32	4.20	3.22
Male		4.24	4.25	3.74	3.36
Race					
White		4.22	4.25	3.96	3.28
Black		3.00	3.00	4.00	3.00
Hispanic		4.43	4.64	4.07	3.64
American Indian	----	----	----	----	
Asian		4.00	3.50	3.00	2.75
Other		4.00	5.00	4.00	3.00
Prior MS Involvement					
Yes		4.19	4.33	4.06	3.44
No		4.24	4.25	3.86	3.22
Length of Time at Renaissance Medical Group					
0 – First Visit		3.50	3.50	4.00	3.00
< 1 year		4.55	4.55	3.91	3.36
1 – 5 years		4.28	4.31	3.90	3.27
> 5 years		4.16	4.19	4.00	3.32

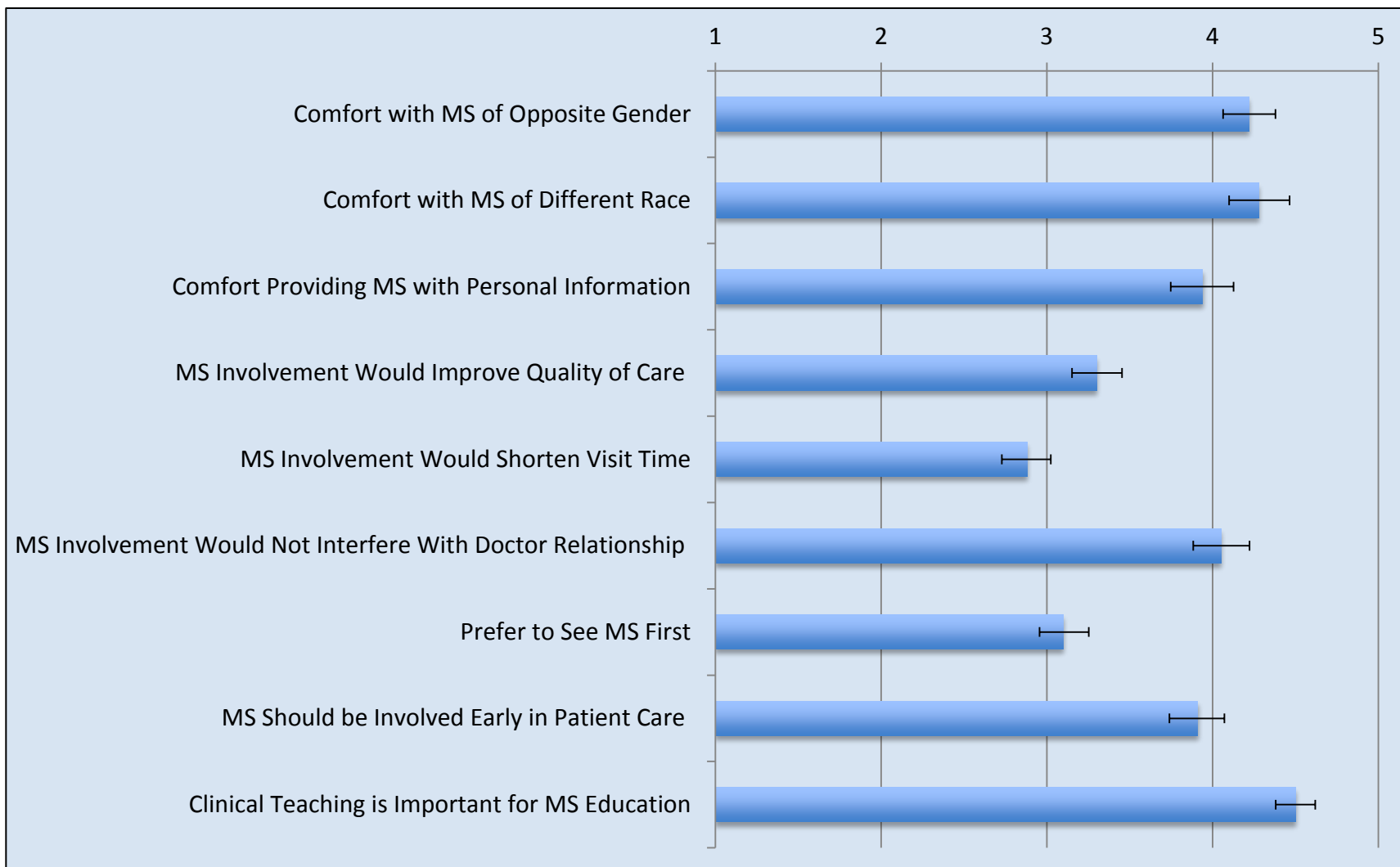
Table 1.2.2 – Patient Demographics by Pre-Exam Patient Attitudes, Overall

	Question	MS Involvement Would Shorten Visit Time	MS Involvement Would Not Interfere With Doctor Relationship	Prefer to See MS First	MS Should be Involved Early in Patient Care	Clinical Teaching is Important for MS Education
Characteristic	Overall	2.88	4.05	3.10	3.91	4.50
Age						
18-34		2.87	4.30	3.26	4.09	4.68
35-44		2.74	4.04	3.00	3.78	4.61
45-54		2.94	3.88	3.18	4.00	4.59
55-64		2.75	3.95	3.00	3.84	4.32
>65		3.23	4.00	3.08	3.77	4.15
Gender						
Female		2.85	4.20	3.17	4.05	4.68
Male		2.89	3.95	3.05	3.80	4.37
Race						
White		2.92	4.01	3.13	3.88	4.47
Black		2.00	4.00	2.00	2.00	----
Hispanic		2.86	4.29	3.21	4.29	4.64
American Indian		----	----	----	----	----
Asian		2.50	3.50	2.25	3.50	4.25
Other		2.50	5.00	3.50	4.00	5.00
Prior MS Involvement						
Yes		2.92	4.17	3.19	4.03	4.64
No		2.85	3.98	3.05	3.83	4.41
Length of Time at Renaissance Medical Group						
0 – First Visit		2.50	3.50	2.50	2.50	3.00
< 1 year		2.82	4.00	2.91	4.00	4.64
1 – 5 years		2.84	3.96	3.16	3.86	4.47
> 5 years		3.00	4.26	3.13	4.03	4.53

Compared to the hypothesis that patients would have neutral pre-exam attitudes towards medical students (MS), 7 of 9 mean attitude scores were higher than neutral (3) with statistical significant of $P < 0.0001$ or less. For the patient attitudes of preferring to see a medical student first and of medical student involvement shortening visit time, there was no statistically significant difference from the neutral attitude (Likert score of 3). Figure 1 displays the overall mean attitude scores with corresponding 95% confidence intervals, as compared to the hypothesis neutral attitude score of 3.

Assessing demographic differences in the mean scores resulted in some statistically significant results for specific attitudes. Patients of different gender had significant differences in their attitude toward providing personal information to medical students, $F(1, 93) = 5.83$, $p = 0.0178$. Males had significantly lower mean score at 3.74 vs. females at 4.20. Different races had significant differences in their attitude on whether medical students should be involved early in patient care, $F(4, 90) = 2.58$, $p = 0.0428$. The mean score for each racial demographic was 3.50 for those identified as Asian or Pacific Islander, 2.00 for Black or African American, 4.29 for Hispanic or Latino, 3.88 for White or Caucasian, and 4.00 for Other. Patients of different age had significant differences in their attitude toward the importance of using patients for medical student education, $F(4, 89) = 2.63$, $p = 0.0393$. These results demonstrated that as age category increased the mean attitude score decreased. For the 18-34 age group, the mean score was 4.68. For the 35-44 age group, the mean score was 4.61. For the 45-54 age group, the mean score was 4.59. For the 55-64 age group, the mean score was 4.32. For the >65 age group, the mean score was 4.15. In addition, patients of different gender had significant differences in their attitude toward the importance of using patients for medical student education, $F(1, 92) = 6.68$, $p = 0.0113$. Males had significantly lower mean score at 4.37 vs. females at 4.68. No other statistically significant differences with $P < 0.05$ were observed. Refer to Tables 1.2.1 and 1.2.2.

Figure 1 – Patient Pre-Exam Attitudes vs. Hypothesis = 3



* Bars Indicate 95% Confidence Interval

Research Objective 2

Of the returned surveys, 88 were usable for Research Objective 2 according to exclusion criteria. Demographic breakdown is similar to Research Objective 1. Age is again nearly uniform ranging from 14.8% to 23.9% (or 13 to 21 respondents) in each of the 5 categorical age groups. Again, there were slightly more male respondents at 56.8% (50 respondents) vs. females at 43.2% (38 respondents). Again, respondents more strongly identified themselves as White or Caucasian at 77.3% (68 of 88). The second largest identified race was Hispanic or Latino at 15.9% (14 respondents). Only 6.8% identified themselves as Black or African American, Asian or Pacific Islander, or as Other. No one identified as American Indian or Alaska Native. The majority of respondents had not had prior medical student involvement in their care (61.4%). The majority of patients also had been receiving care at Renaissance Medical Group for 1 to 5 years (50.6%). A greater majority, 85.1%, had received care at Renaissance Medical Group for greater than 1 year. An additional characteristic of this population was whether or not the interaction involved seeing a medical student alone prior to the physician. Overwhelmingly, as intended in the study method, 94.3% of patients (83 of 86) interacted with a student alone prior to the physician. Refer to Table 2.1.

The purpose of Research Objective 2 was to determine the overall patient perspective on the medical student experience and determine if patients want to provide feedback. Again, also looking for demographic differences. The mean response scores for each attitude question overall and by demographic are displayed in Table 2.2. Patients had mean Likert scores of 4 or above on 3 of 4 attitudes (Enjoyed MS Experience, Satisfied with MS Level of Involvement, and Willingness to Provide Feedback). At 3.36, the lowest mean score was for the patient attitude that providing feedback would improve the patient care experience. Compared to the hypothesis that patients would have positive (Likert Score of 4) overall post-exam attitudes towards medical students and on providing feedback, 2 of 4 attitude scores were higher than “agree” (Likert of 4) with statistical significant of $P < 0.0000$. These attitudes were enjoying the medical student experience and satisfaction with the medical student level of involvement. For willingness to provide feedback, there was no statistically significant difference from the “agree” attitude (Likert score of 4).

Table 2.1 – Overall Patient Demographics for Research Objective 2

Characteristic	No. Patients	%
Total	88	
Age		
18-34	21	23.9
35-44	19	21.6
45-54	17	19.3
55-64	18	20.5
>65	13	14.8
Gender		
Female	38	43.2
Male	50	56.8
Race		
White or Caucasian	68	77.3
Black or African American	1	1.1
Hispanic or Latino	14	15.9
American Indian or Alaska Native	0	0
Asian or Pacific Islander	4	4.6
Other	1	1.1
Prior Medical Student Involvement in Care		
Yes	34	38.6
No	54	61.4
Length of Time at Renaissance Medical Group		
0 – First Visit	2	2.3
< 1 year	11	12.6
1 – 5 years	44	50.6
> 5 years	30	34.5
Interaction Involved Seeing a Medical Student Alone Prior to a Physician		
Yes	83	94.3
No	5	5.7

Table 2.2 – Patient Demographics by Patient Attitudes on Feedback, Overall

	Question	Enjoyed MS Experience	Satisfied with MS Level of Involvement	Willingness to Provide Feedback	Providing Feedback Would Improve Experience
Characteristic	Overall	4.49	4.44	4.01	3.36
Age					
18-34		4.52	4.48	4.14	3.71
35-44		4.42	4.47	3.95	3.16
45-54		4.47	4.41	4.18	3.35
55-64		4.50	4.33	3.78	3.17
>65		4.54	4.54	4.00	3.38
Gender					
Female		4.61	4.61	4.16	3.45
Male		4.40	4.32	3.90	3.30
Race					
White		4.56	4.41	3.96	3.31
Black		5.00	5.00	4.00	3.00
Hispanic		4.71	4.71	4.50	3.64
American Indian		----	----	----	----
Asian		4.00	3.75	3.00	3.50
Other		5.00	5.00	5.00	3.00
Prior MS Involvement					
Yes		4.50	4.50	4.24	3.35
No		4.48	4.41	3.87	3.37
Length of Time at Renaissance Medical Group					
0 – First Visit		4.00	4.00	3.50	3.00
< 1 year		4.64	4.64	4.55	3.45
1 – 5 years		4.45	4.41	3.98	3.39
> 5 years		4.53	4.47	3.90	3.33
Interaction Involved Seeing a MS Alone Prior to a Physician					
Yes		4.51	4.46	4.00	3.36
No		4.20	4.20	4.20	3.40

The attitude that providing feedback would improve the patient care experience was significantly lower than hypothesized with a mean of 3.36. Figure 2 displays the overall mean attitude scores with corresponding 95% confidence intervals, as compared to the hypothesis “agree” attitude score of 4.

Assessing demographic differences in the mean scores resulted in some statistically significant results for specific attitudes. Patients of different gender had significant differences in their satisfaction with the level of medical student involvement in their care, $F(1, 86) = 4.20$, $p=0.0434$. Males had significantly lower mean score at 4.32 vs. females at 4.61. Different races had significant differences in their willingness to provide feedback, $F(4, 83) = 3.29$, $p=0.0149$. The mean score for each racial demographic was 3.00 for those identified as Asian or Pacific Islander, 4.00 for Black or African American, 4.50 for Hispanic or Latino, 3.96 for White or Caucasian, and 5.00 for Other. In addition, patients of different past medical student involvement had significant differences in their willingness to provide feedback, $F(1, 86) = 3.97$, $p=0.0495$. Respondents who had no prior medical student involvement in their care had significantly lower mean score at 3.87 vs. those that had prior medical student involvement at 4.24. No other statistically significant differences with $P<0.05$ were observed. Refer to Table 2.2.

Figure 2 – Patient Attitudes on Feedback vs. Hypothesis = 4



* Bars Indicate 95% Confidence Interval

Research Objective 3

Of the returned surveys, 89 were usable for Research Objective 3 according to exclusion criteria. Demographic breakdown is similar to Research Objective 1 and 2. Age is again nearly uniform ranging from 14.6% to 24.7% (or 13 to 22 respondents) in each of the 5 categorical age groups. Again, there were slightly more male respondents at 57.3% (51 respondents) vs. females at 42.7% (38 respondents). Again, respondents more strongly identified themselves as White or Caucasian at 76.4% (68 of 89). The second largest identified race was Hispanic or Latino at 15.7% (14 respondents). Only 7.9% identified themselves as Black or African American, Asian or Pacific Islander, or as Other. No one identified as American Indian or Alaska Native. The majority of respondents had not had prior medical student involvement in their care (61.8%). The majority of patients also had been receiving care at Renaissance Medical Group for 1 to 5 years (52.3%). A greater majority, 85.3%, had received care at Renaissance Medical Group for greater than 1 year. An additional characteristic of this population was whether or not the interaction involved seeing a medical student alone prior to the physician. Overwhelmingly, as intended in the study method, 96.6% of patients (86 of 89) interacted with a student alone prior to the physician. Refer to Table 3.

The purpose of Research Objective 3 was to determine pre-to-post interaction change in patient attitudes. Again, also looking for demographic differences. The mean response scores for each attitude question overall pre-exam and post-exam are displayed in Table 3.2. All post-exam scores were higher than pre-exam scores. However, the difference in scores for attitudes on comfort with MS of opposite gender and comfort with MS of different race were not statistically significant. The differences in pre-exam and post-exam scores on all other attitudes were significant with p values of 0.0155 or less. Figure 3 displays the pre-exam and post-exam mean attitude scores with corresponding 95% confidence intervals.

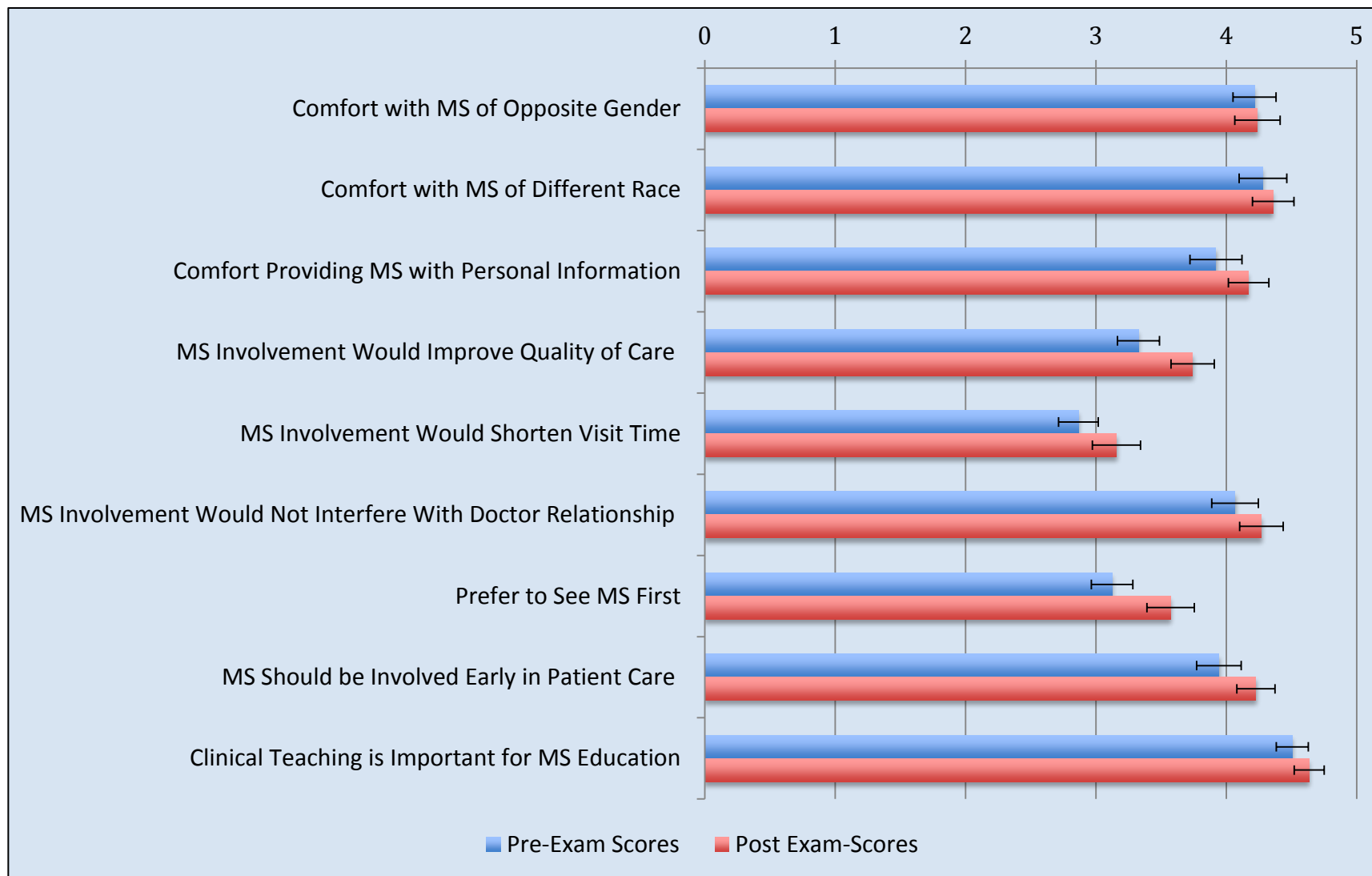
Table 3.1 – Overall Patient Demographics for Research Objective 3

Characteristic	No. Patients	%
Total	89	
Age		
18-34	22	24.7
35-44	21	23.6
45-54	16	18.0
55-64	17	19.1
>65	13	14.6
Gender		
Female	38	42.7
Male	51	57.3
Race		
White or Caucasian	68	76.4
Black or African American	1	1.1
Hispanic or Latino	14	15.7
American Indian or Alaska Native	0	0
Asian or Pacific Islander	4	4.5
Other	2	2.3
Prior Medical Student Involvement in Care		
Yes	34	38.2
No	55	61.8
Length of Time at Renaissance Medical Group		
0 – First Visit	2	2.3
< 1 year	11	12.5
1 – 5 years	46	52.3
> 5 years	29	33.0
Interaction Involved Seeing a Medical Student Alone Prior to a Physician		
Yes	86	96.6
No	3	3.4

Table 3.1 – Pre-Exam vs. Post-Exam Patient Attitudes

Question	Pre-Exam	Post-Exam	P-Value
Comfort with MS of Opposite Gender	4.22	4.24	0.7172
Comfort with MS of Different Race	4.28	4.36	0.1960
Comfort Providing MS with Personal Information	3.92	4.17	0.0001
MS Involvement Would Improve Quality of Care	3.33	3.74	0.0000
MS Involvement Would Shorten Visit Time	2.87	3.16	0.0005
MS Involvement Would Not Interfere With Doctor Relationship	4.07	4.27	0.0101
Prefer to See MS First	3.12	3.57	0.0000
MS Should be Involved Early in Patient Care	3.94	4.23	0.0001
Clinical Teaching is Important for MS Education	4.51	4.64	0.0155

Figure 3 – Pre-Exam vs. Post-Exam Patient Attitudes



* Bars Indicate 95% Confidence Interval

Assessing demographic differences in the mean score differences (from pre to post exam) resulted in some statistically significant results for specific attitudes. Different races had significant differences in their pre to post test responses on their comfort with medical students of the opposite gender, $F(4, 83) = 2.88, p=0.0276$. The mean pre-to-post exam difference for each racial demographic was -0.75 for those identified as Asian or Pacific Islander, -1.00 for Black or African American, +0.07 for Hispanic or Latino, +0.07 for White or Caucasian, and 0.00 for Other. Patients of different gender had significant differences in their pre to post test responses on quality of care, $F(1, 88) = 10.93, p=0.0014$. Males had significantly lower mean score differences at +0.20 vs. females at +0.71. Finally, patients of different age had significant differences in their pre to post test responses on visit time, $F(4, 84) = 4.09, p=0.0044$. For the 18-34 age group, the mean score difference was +0.77. For the 35-44 age group, the mean score difference was +0.10. For the 45-54 age group, the mean score was -0.06. For the 55-64 age group, the mean score was +0.35. For the >65 age group, the mean score was +0.15. No other statistically significant differences with $P<0.05$ were observed.

Discussion

Interpretation of Research Objective 1

When walking in the door, what is the perception of medical students? The answer is favorable. As observed in previous studies and as hypothesized, the patient population at Renaissance Medical Group had predominately positive attitudes toward medical students. However, somewhat surprisingly, these attitudes were overall positive prior to any medical student intervention. Only on visit time, did patients report to have low neutral attitudes. This is reasonable as medical student involvement is likely to lengthen the visit time, but this interaction is not perceived by patients to negatively affect their care.

While over all, patients had neutral to positive attitudes, some demographic differences are of note. Interestingly, patients of different gender had significant differences in their attitude toward providing personal information to medical students and in their attitude toward the importance of using patients for medical student education. While both had neutral to positive responses, surprisingly, males had significantly lower mean scores on these attitudes than females. This is the opposite of what was hypothesized, based on prior studies. On the remaining 7 measures, there were no significant gender differences, but perhaps going forward males need further education on medical students and reassurance on privacy of their personal information.

Also, in regards to the attitude on importance of using patients for medical student education, differences in age provided one of the more interesting results of the study. Again, all ages were in agreement that patients were important for medical student education (all mean scores were greater than 4). However, the results demonstrated that as the age category increased the mean attitude score decreased. It can only be theorized as to why this trend exists. Perhaps, younger populations are better educated on importance of medical student education? Either way, this insight is significant going forward.

The other significant demographic finding in Research Objective 1 was that different races had significant differences in their attitude on whether medical students should be involved early in patient care. Looking only at the two races well represented in this study (White and Hispanic), Hispanics had a significantly higher mean score than Whites. While an

interesting finding, this may not be easily extrapolated to other care settings or a particularly useful area of future intervention. See below for further discussion on the limitations of this study.

Interestingly, on every measured attitude, length of time at Renaissance Medical Group and prior medical student experience had no significant impact. Despite the fact 38.5% of respondents had no prior medical student involvement in their care, this population responded no differently than those that had. This implies that long-term changes in attitudes toward medical students may not be a function of either of these measures. It was originally hypothesized that patients with prior medical student experience and those who had received care longer from the provider would respond more positively. Also, in contrast to the study hypothesis, younger female patients did not have more neutral attitudes toward medical students than older males.

Interpretation of Research Objective 2

What do patients think of their overall medical student experience? Patients agree (Likert score of 4) that they enjoyed their experience with a medical student and are satisfied with the level of medical student involvement in their care. While a statistical difference for males and females was demonstrated on patient satisfaction with the level of medical student involvement in their care, this finding may not be useful as an area of intervention. Both had high scores with means above 4.3.

A major tenet of the study was the belief that patients would be willing to provide feedback. Overwhelmingly, they are. Patients do not overwhelmingly believe that providing this feedback would improve their patient care experience. However, at the very least, it does not seem that providing feedback would negatively affect their experience.

Interestingly, different races had significant differences in their willingness to provide feedback. Perhaps cultural differences may account for this difference? Or, in fact, the results may not be reliable, because the sample size for each race is so low (with the exception of the White population group). See further discussion below.

In addition, patients of different past medical student involvement had significant differences in their willingness to provide feedback. This may provide an interesting insight.

Those with no prior medical student involvement in their care had significantly lower scores with a mean of 3.87. Perhaps, patients with prior medical student involvement should be offered the opportunity to provide medical student feedback first.

Interpretation of Research Objective 3

Does the medical student interaction change patient perspective? Yes. As hypothesized, all post-exam scores were higher than pre-exam scores. However, the difference in scores for attitudes on comfort with MS of opposite gender and comfort with MS of different race were not statistically significant. Further evaluation of Figure 3, provides additional insight. For two of the attitude measures, MS involvement would improve quality of care and prefer to see MS first, the 95% confidence intervals for pre-exam and post-exam scores do not overlap. Thus, these are the two attitudes that demonstrate the greatest significant change from pre to post medical student intervention. At least at Renaissance Medical Group, without any pre-defined patient education plan, patients end their medical student experience with a greater desire to see a medical student first at their next visit and with a greater appreciation that medical student involvement improves their health care experience. This is profound and reassuring that the patient-student interaction in and of itself is improving patient attitudes toward medical students, even in the private practice setting.

The statistically significant demographic differences in pre-to-post test do not provide any additional insight.

Study Limitations

Setting and Patient Population

While the demographics reflect the make-up of Renaissance Medical Group, it would be difficult to extrapolate this data to other patient populations.

Minority populations are not well represented in this study. It would be difficult to make any specific conclusions about racial groups and their attitudes toward medical students, outside the study setting. Depending on the research arm, only 6.8% to 7.9% of respondents identified as non-White and non-Hispanic.

Study Instrument and Survey Administration

The survey length was designed for patient ease of completion and site acceptance without compromising a solid basis for comparison. However, this did limit the depth and number of questions, as was utilized in some prior studies.

The Likert scale itself is a way to objectify subjective attitudes and may not be easily reproducible. The same patient could have different answers on a later encounter and it is difficult to control for this.

As intended in the study method, 94.3%-96.6% of patients interacted with a student alone prior to the physician. However, this should have been 100%, according to the method, in order to truly study the influence of the medical student interaction, independent of initial physician oversight.

The data collection method had barriers to success. In the study method, participants who refused to participate in the study were to be counted by retaining a blank survey in a specified refusal folder. At the end of the study, these were to be counted. Unfortunately, this was not completed in a way to determine a count of potential study participants who refused to participate. Those who refused to participate may have also been those individuals with more negative or neutral attitudes toward medical students. Without participation of these individuals or at least a better understanding of their refusal, the results from this study could be skewed to more positive outcomes.

Another potential concern addressed in the study method was the avoidance of multiple submissions by the same patient. This was addressed by the survey question "have you completed this survey in the past", but obviously this required patient compliance. Other methods, such as identifying the respondent by name, would have eliminated this concern, but would have jeopardized the anonymity of participants. Such a method would have required the use of patient identifying data and prevented IRB exemption.

While the study attempted to limit influence by the practitioner and medical student, due to limitations in resources, the study was not well blinded. Patients were instructed to complete the survey in the waiting area, but medical students and the physician were aware that the study was taking place in the office.

Another limitation of the study method was that individual medical students were not accounted for, i.e. there was no medical student control. At least 4 medical students participated in the study, but the data collection method prevented them from being identified.

Data Points and Analysis

The original project design called for 300 surveys to be collected in order to obtain high statistical power and to supersede the number of data points collected in prior studies. A sample size of 300 provided a power of 80% with $p=0.05$, $\mu(\delta)=0.13$, and $\sigma=0.8$. Unfortunately, the desired sample size was not obtained over the 10-month period. The limiting factor in obtaining the desired number of surveys was most likely a result of the number of patients medical students saw over the study period. 300 was likely an overestimate in the study design.

However, enough data were collected to provide objective results and obtain statistical significance for the primary study objectives. The post-hoc power was significantly lower, due to the decreased sample size, at approximately 50% (with $p=0.05$, $\mu(\delta)=0.13$, and $\sigma=0.8$).

Significant time was devoted to determine the best method of statistical analysis. There are various arguments about how Likert data should be identified, as interval and normal vs. interval vs. ordinal. In order to obtain means and confidence intervals, the data in this study were considered to be interval and normal. However, it can be argued that for better data interpretation, methods such as the Wilcoxon signed ranks test and Kruskal Wallis test should be used in place of the paired t-test and one-way ANOVA, respectively. Some prior studies considered the Likert data as interval and normal, while others considered the data as interval.

Targets for Intervention

In regards to changes in family practice, this study does provide a basis for areas of improvement. For example, patients answered neutral that medical student involvement would shorten the time it takes to complete a visit. Patients should be reassured that even if the visit takes longer, the quality of care afforded by medical student involvement would be better.

This study demonstrates that patient attitudes can be changed by medical student

intervention. At Renaissance Medical Group and other private practices, a pre-constructed patient education plan can further improve these attitudes, such that patients leave their visit with a better appreciation for medical education and a greater desire to be seen by a medical student.

Male patients and older patient populations could be provided further education on medical student interaction. In addition, they could be afforded additional reassurance on the privacy of their personal information. Cultural considerations could also be taken into account with medical student interaction.

As previously discussed, patient feedback could be used to augment student education, without detriment to the patient care experience. A standardized feedback method could be developed for the benefit of medical students. If such a feedback method were in place, future studies could better evaluate if patients have a more positive outlook on their clinical experience, when they are more involved in the student's education.

Future Research Directions

Moving forward, this study can also be useful as a basis for further research. As previously mentioned, the pre-post patient medical student interaction has not been adequately looked at in prior studies. As was done in this study, pre-to-post exam changes in patient attitude needs to be further evaluated. A future study could look at particular visit situations in the private primary care setting and how the view towards medical student interaction changes. For example, data could be collected in order to distinguish if the visit type was a well-woman exam vs. a medical refill vs. etc. To meet IRB exception status, this type of data were not collected in this study, but could be looked at in the future. There may be specific patient care experiences where a patient has lower or even negative post-test change in their attitudes toward medical students. During certain visit situations, it may be more significant for the provider to reinforce to the patient the importance of medical student involvement. This has been studied in certain practices, particularly Obstetrics and Gynecology, but not in depth in the private family practice setting.

After understanding the design constraints and limitations of this study, future studies could also be better constructed. A repeat or future study could be better constructed to limit bias, by blinding it to the practitioner and the medical student. As discussed, a subjective measure like attitude is difficult to study objectively. While the survey method and Likert scale provide the potential means for this, future studies could look at more quantifiable data. For example, patient fall-out could be studied as a function of medical student interaction.

Conclusions

Family Medicine is the portal of entry to the health care system and makes significant contribution to patient care and medical education. As the healthcare system changes, primary care will need to grow to meet demand and medical student education will need to accompany this growth. With the need to educate more medical students, patient-student interactions will undoubtedly increase.

While patients overall have positive attitudes toward medical student interaction in their care, there are areas for improvement. And as the healthcare system changes, putting potential strains on patients, practitioners, and students, it is important that patients maintain this willingness and desire to participate in medical student education.

Ultimately, this study serves as a starting point. This study identifies areas where patient education may be valuable in changing attitudes. This study also provides direction for future research, which will be essential to determine where and how the student-patient relationship can be maintained and improved upon.

While this and future research can provide the data for areas of intervention, the weight rests on the shoulders of the Family Medicine specialist. The Family Physician is instrumental in the relationship between the patient and student. The point of intervention and education is in the patient room with the physician and medical student at bedside. Only there, can patient education be directed to ensure continued patient participation in medical student education.

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Appendix A – Survey

A Survey to Evaluate Patient Attitudes Toward Medical Students

Thank you for taking the time to help the University of Arizona College of Medicine-Phoenix with this research study. Your responses are valued and your participation is appreciated.

This survey consists of two parts. Please complete questions 1 through 7 in the waiting room prior to being seen by the clinical staff. After finishing your visit with the clinical staff, please return to the waiting room and complete questions 8 through 12.

Please do not write your name or any identifying information.

If you have any questions about completing this survey, please ask the staff at the front desk.

1) Have you completed this survey in the past?

Yes

No

If “Yes”, please return your survey at this time to the front desk in the marked box without answering any additional questions.

2) My age is:

18 to 34

35 to 44

45 to 54

55 to 64

65 and over

3) My gender is:

Male

Female

4) My race is:

White or Caucasian

Black or African American

Hispanic or Latino

American Indian or Alaska Native

Asian or Pacific Islander

Other _____

5) Medical students have been involved in my healthcare in the past

Yes

No

6) I have received healthcare from Renaissance Medical Group for

0 years - This is my first visit

<1 year

1-5 years

>5 years

7) Please answer the following in regards to your feelings about medical students.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I would be comfortable interacting with a medical student of the opposite sex.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would be comfortable interacting with a medical student of a different race.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would be comfortable providing a medical student with personal information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Having a medical student involved in my care would improve the quality of care I receive.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Having a medical student involved in my care would shorten the time it takes to complete my visit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Having a medical student involved in my care would not interfere with the relationship I have with my doctor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would prefer to see the medical student first.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medical students should become involved in patient care early.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clinical teaching using patients is important for medical student education.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Thank you for completing the initial portion of this study. Please keep this packet with you, during your visit. Finish the remaining questions after completing your visit with the clinical staff.

After completing your visit with the clinical staff, please return to the waiting room and finish answering the remaining questions.

8) Did you interact with a medical student today?

Yes

No

If “No”, please skip to question 12.

9) Did you interact with the medical student alone prior to seeing the doctor?

Yes

No

10) After your interaction with the medical student, please answer the following in regards to your feelings about medical students.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I would be comfortable interacting with a medical student of the opposite sex.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would be comfortable interacting with a medical student of a different race.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would be comfortable providing a medical student with personal information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Having a medical student involved in my care would improve the quality of care I receive.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Having a medical student involved in my care would shorten the time it takes to complete my visit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Having a medical student involved in my care would not interfere with the relationship I have with my doctor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would prefer to see the medical student first.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medical students should become involved in patient care early.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clinical teaching using patients is important for medical student education.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11) Please answer the following about your medical student interaction today.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I enjoyed the experience with the medical student.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was satisfied with the level of involvement of medical students in my care.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would be willing to provide written anonymous feedback to the medical student.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Providing written anonymous feedback to the medical student would improve my visit experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12) Any additional comments:

Thank you for taking part in this study.

Please return your completed survey to the front desk in the marked box.

Appendix B – Recruitment Letter

Dear Patient,

I am writing to tell you about a research study being conducted at Renaissance Medical Group. I am letting all of my patients over the age of 18 know about this research project, in case they would like to participate.

Scott Kaser, a medical student at the University of Arizona College of Medicine Phoenix, is studying the interaction between patients and medical students in the clinical setting. Medical student education requires frequent interaction with patients; however, patients may or may not directly benefit from the involvement of medical students in their care. This research study is designed to assess the current state of the student-patient relationship from the patient perspective.

Participation would involve the completion of one anonymous survey, lasting about 5-10 minutes. The survey asks demographic questions (age, sex, race, etc.) and questions about your feelings toward medical student participation in your healthcare.

An Institutional Review Board responsible for human subjects research at The University of Arizona reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.

You will not receive any benefits as a result of your participation in this research study. We hope that the results will help us understand the patient-student relationship better, and improve student education and patient care in the future.

If you would like to participate, please complete the attached survey. Your participation is voluntary. Whether you participate or not will have no effect on the medical care you receive here at Renaissance Medical Group. If you do not want to participate, please return the attached blank survey to the front desk staff or to the marked box at the front desk. You may keep this letter if you have additional questions. Thank you for considering this request.

Sincerely,

Dr. Andrew Carroll, MD
Renaissance Medical Group
(480) 282-8336

Scott Kaser, Medical Student
University of Arizona
College of Medicine Phoenix
scottk@email.arizona.edu

Appendix C – Study Instructions for Staff

When a medical student is participating in patient care:

- Please offer a blank study packet to every patient, over the age of 18
 - *“Would you be interested in taking part in a voluntary research study exploring patient attitudes toward medical students?”*
 - *“All of the study information and material is located in this packet. Please read over everything thoroughly. If you would like to participate, please complete the survey.”*

If a patient does not want to participate:

- Please place a blank packet in the file labeled “Blank Surveys of Participants That Decline Study” - (this will help determine an accurate response rate)

Please help participants place all completed surveys in this return box in the file labeled “Completed Forms”

To Save Money:

- Please save extra patient letters in the appropriate file for future packets
- Please save spare paperclips

Please keep the box locked when not in use

Appendix D – IRB Approval



Human Subjects
Protection Program

1618 E. Helen St.
P.O. Box 245137
Tucson, AZ 85724-5137
Tel: (520) 626-6721
<http://oecr.vpr.arizona.edu/irb>

HSPP Correspondence Form

Date: 11/30/11

Investigator: Andrew Carroll, MD

Department: Renaissance Medical Group

Advisor: Stuart D. Flynn, MD

Project No./Title: 11-0856-00 Patient Attitudes Regarding Medical Student Involvement in a Primary Care Setting

Current Period of Approval: 11/30/11–no expiration

Submit the "FORM: Continuing Review Progress Report" no later than 45 days prior to the end of the approval period listed above.

IRB Committee Information

Administrative Action

Administrative Review – New Project

FWA Number: FWA00004218

Documents Reviewed Concurrently

F207 Application for COM-Phoenix Scholarly Projects (signed 09/30/11)

F107 VOTF (signed 10/19/11, revised 11/14/11)

Recruitment Materials:

Dear Patient Letter (received 11/14/11)

Data Collection Instruments:

A Survey to Evaluate Patient Attitudes Toward Medical Students

Prospectus:

COM-Phoenix Scholarly Project Prospectus (edited 11/14/11)

UA Student Scope of Work (received 11/14/11)

Other (define):

Study Instructions for Staff

Confirmation of NDI Submission (Kaser)

Carroll CV

Kaser CV

Flynn CV

Determination

Approved as submitted effective 11/30/11

Comments

- **PHI Authorization Form not required.** No Protected Health Information (PHI) is being collected in this study.

Regulatory Determination(s)

- **Exempt Approval 45 CFR 46.101(b)(2):** Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior.

11/30/11

Sheryl Wurl, PhD

Date

Director, Human Subjects Protection Program

Reminders: No changes to a project may be made prior to IRB approval except to eliminate apparent immediate hazard to subjects.

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T116: HSPP Correspondence Form
Form version: 08/19/2011

Appendix E – Data and Written Comments from Survey Respondents

Original data in excel format is available upon request.

Comments (unedited except where needed to remove identifiable information):

- I like him
- Student was very polite, interested in what I had to say and was very thorough.
- He did a great job very professional! Many students forget to watch their hands, and he did not. He was very nice and approachable. He will make a great doctor some day!
- Very thorough with questions - listened. Very personal and friendly.
- "Student" was very observant and listened and questioned us on all aspects. Very enjoyable and I think would be a good diagnostician.
- Very personable, made me (patient) feel at ease and that my care was paramount and important to the future doctor. Well Done - A good doctor that really cares about his patients.
- Very nice, engaging student.
- Thank you.
- She did a fine job ask questions that was good!
- None at this time
- Student asked good/approp questions - Friendly. Seemed interested in pt. Good listener.
- She is very friendly, seems to know relevant information. It's helpful to have Dr. Carroll see me, because I feel he asks specific questions to uncover root causes, or confirm it may not be something more serious. I appreciate being thorough in diagnosing what may or may not affect me.
- Medical student was very pleasant and efficient. Enjoyed my interaction.
- Student made me feel comfortable and answered my questions
- Easy to talk too, start off by asking why I came in. Asked about medical condition.
- I really enjoyed meeting with the medical student. She was really thorough in her exam and explained what was going on in a manner we could understand. I really hope she gets hired on in this office. She is really great!!!

- Medical Student was warm - compationit. Maid good eye contact and listen very very well.
- Very wonderful bedside matter. Felt she was concerened with me and wanted to help. She informed the doctor fully of what was wrong.
- Having the medical student interact w/ patients provides good expierence to both patient and student
- Very professional. Thank you!
- Good bedside manner - very comfortable w/ patient
- None. Hand sanitizing not adequate.
- All positive.
- I found the medical student helpful. They asked more questions than my doctor usually does. I felt listened to. I did also want the doctor there too. I found it helpful to have both together.
- The medical student appeared comfortable as well as knowledgable. I enjoyed the experience.
- *I believe it is critical for a student to become familiar with a practicing physician to help learn how the whole office operates.*
- Seem really interested in my problems.