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THE IMPORTANCE OF SOCIAL SCIENCE IN BIOMEDICAL EDUCATION

by

Kathryn Asalone

A Thesis Submitted in Partial Fulfillment  
of the Requirements for a Degree with Honors  
Zoology

The Honors College

University of Maine

May 2017

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## ABSTRACT

This study proposes an intervention in undergraduate education that could enhance doctor-patient interactions. This intervention would provide evidence, to pre-medical students, that social science training is important during medical school. Semi-structured interviews were conducted of six doctors from hospitals in the Maine. The goal was to determine whether or not taking more social science courses during an MD's undergraduate education would result in better reported doctor satisfaction with their patient interactions. The interview questions were designed to encourage doctors to explain how they interact with patients and coworkers and to describe their undergraduate education. This information and the impressions that they made during the interview were evaluated to determine what their average doctor-patient interaction might look like. The information was analyzed under the context of their undergraduate education to uncover an early intervention to help create better doctors. A rubric was used to examine the interviews and to score aspects of the doctor's main goals in patient interactions. It could not be determined whether or not more social science courses in undergraduate education would lead to better physicians. However, this information could be used to propose a new course that would aid in the training for particular skills that would lead to better patient interactions. Further research should be done using a larger sample size to identify more trends.

## DEDICATION

This research is dedicated to my grandfather, William J. Smart, and the doctors who made the last month of his life as comfortable as possible.

## ACKNOWLEDGMENTS

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## INTRODUCTION

In 2015, 83.6% of adults and 93.0% of children in the United States had contact with a physician (CDC, 2017). Through a medical office visit, patients will interact with secretaries, medical technologists, nurses, and doctors. Due to the multiple ways patient-practitioner communication influences the patient, interactions with the doctor are some of the most important. An open and comfortable communication stream leads to greater patient disclosure. Full disclosure aids in the doctor's ability to make a proper diagnosis, the patient's willingness to follow the medical advice that is given and the patient's willingness to take medication as prescribed (Ha *et al.*, 2010). A method of care that encourages a positive patient-physician relationship is called "patient-centered care" (Levinson, 2010).

### The New MCAT

Patient-centered care outlines the importance of quality communication between practitioners and patients. Whether practicing patient-centered or other methods of care, interpersonal communication is a vital skill for adequate medical treatment and patient satisfaction. In a study exploring the effects of an interpersonal communication course on doctors' performance, it was found that doctors who went through this training had higher patient satisfaction and the atmosphere was a more positive one for both the doctor and the patient (Roter *et al.*, 1998). Studies such as Roter *et al.* show that doctor performance is enhanced with better interpersonal communication skills. These ideals are reflected in the recent changes in the Medical College Admission Test (MCAT). In 2015, the MCAT gained a new section called Behavioral Psychology. The idea behind this new

exam structure has five main goals seen in table 1. One of the new goals is to test the understanding of the implications social behavior has on health (Schwartzstein *et al.*, 2013).

**Table 1**

Goals for the new MCAT structure. Information taken directly from *Academic Medicine* and formatted in table (Schwartzstein *et al.*, 2013).

<b>Goal 1</b>	Test natural sciences competencies.
<b>Goal 2</b>	Test foundations for learning about the human and social aspects of medicine.
<b>Goal 3</b>	Test scientific inquiry and research skills.
<b>Goal 4</b>	Communicate the need to read broadly in the humanities and social sciences.
<b>Goal 5</b>	Balance testing in the natural, social, and behavioral sciences and critical analysis and reasoning.

This change in the MCAT begs the question, are pre-medical undergraduate classes preparing students adequately for the MCAT and, ultimately, their futures? Prichard examined the new section for the MCAT with the intention of determining a course that would give the students the knowledge they need to do well on the new exam. This author suggested that Neuroscience courses would provide the pre-med majors with the required competencies for the new MCAT (Prichard, 2015). Neuroscience classes are highly interdisciplinary which leads to deeper understanding of how biology and psychology work together. Neuroscience courses can inform students to appreciate how important psychology is to a person's health.

### Intersection of Social and Biomedical Science

A study was done to see how receptive biomedical scientists were to social science. Biomedical scientists apart of a peer review board were participants in semi-structured interviews to obtain data on this topic. Biomedical scientists show mainly

negative attitudes towards social science and social science research (Albert *et al.*, 2008). In the medical field, health is thought of, first, as a physiological event. Social effects on health take a backseat to the physiological determinants of health (Albert *et al.*, 2008). However, some major health issues, i.e. smoking, are shaped by social factors such as advertisements or peer-pressure.

Socioeconomic factors can also play a large role in health behaviors (Glass *et al.*, 2006). A good example of this is lack of fresh fruit and vegetables and other healthy foods in some parts of the country. If these foods are at a high demand with a low supply the prices are going to skyrocket. If the people who are living in these areas, or even areas that have a large supply but high pricing, and do not have the income to support the higher cost of food, their nutrition suffers. A doctor's understanding of how social factors can affect a patient and their lifestyle choices can aid in proper diagnosis, prognosis and treatment development. However, in order to compel the patient to fully disclose to their physician there must be a feeling of security in the doctor-patient relationship. This trust stems from a quality line of communication.

### Patient Satisfaction

Patient-centered care outlines ways to best improve doctor-patient trust. Two of the major takeaway points are compassion and self-awareness (Stewart *et al.*, 2014). If a patient feels as though their physician cares about their health outcome, it is more likely that the patient will take the advice of the doctor. It is also important that the physician is self-aware because interactions can be affected by a physical reaction to comments made by the patient (Levinson *et al.*, 2010). The effects of physical reactions on doctor-patient

relationships mean that a physician needs to know how to control their body language and facial expressions to remain professional. Good communication also affects patient satisfaction.

One study on patient satisfaction by Jackson *et al.* found that doctor-patient communication had the largest effect on satisfaction right after the visit. When patients were surveyed at two weeks and three months out, satisfaction was largely based on if the treatment was effective or not (Jackson *et al.*, 2001). What this study did not consider was that doctor-patient communication influences behaviors such as following doctor's orders (Haskard *et al.*, 2009). If patients are not listening to what the doctor told them to do, their symptoms may not improve leading to the perception that the treatment does not work.

The standards set by patient-centered care (Table 2), if followed by physicians even in hospitals that do not adopt this model, will result in more positive doctor-patient relationships which leads to better treatment outcomes. This method of care requires a great deal of communication skills; being able to listen to the concerns of the patient and to hear what they desire from their care. Another goal of patient-centered care is to bridge the potential socioeconomic differences between doctors and patients (Epstein *et al.*, 2010). This disconnect can cause many issues when trying to solve a health problem that stems from a social backdrop. If a person does not have the money to afford healthy foods, it may be insensitive for the physician to tell the person that one of the best ways to feel better is to eat more whole foods. The best thing the doctor could do would be to work out a feasible plan within the patient's budget.

**Table 2**  
Main tenets of patient-centered care (Shaller, 2007)

<i>Tenets</i>	<i>Comments</i>
<i>Dignity and respect</i>	Could also say compassion and sympathy. This involves listening to the goals/ wants of the patient.
<i>Information-sharing</i>	Giving patient all options with unbiased information.
<i>Participation</i>	Decision making is not just for the doctor, the patient and their family are involved.
<i>Collaboration</i>	Patients can also be involved in policy making to make the medical visit better next time.

In a study conducted by Hojat *et al.*, it was shown that when empathy was exhibited in a doctor-patient relationship, there were better outcomes of the treatment. In this study, the researchers determined the correlation between a physician's score on an empathy test and the outcome of diabetic patients' health. Physician's who had higher empathy scores had patients with a higher likelihood to have better control of their LDL-C and hemoglobin A1c levels (Hojat *et al.*, 2011). Empathy indicates to the patient that the doctor cares about them which may increase their receptiveness to treatment plans and to disclose more information that will help the physician fully understand the context of the medical issue (Hojat *et al.*, 2011). Their findings are important to any health issue that is being addressed, but especially for behavioral health issues. Behavioral health issues can be very personal and trusting the doctor is key to being willing to speak freely about the struggles that are being experienced.

### Patient-Centered Care

With patient-centered care a physician should look at the whole person and not just the physiological side of health. This method of care emphasizes the development of particular skills or practices. These skills include shared-decision making, patient-

physician relationship building, and meeting the patient where they are (Bernabeo *et al.*, 2013). This last point is a very important one that ultimately effects the first two. In order for the patient to be able to make an informed decision on their care, the treatment options must be explained first. This is when a doctor's understanding of their patient's knowledge level is imperative. If a doctor states a bunch of medical terms and the patient does not know what they are saying, it will make it difficult for them to make the best decision. Meeting someone where they are aids in relationship building because this method can come off as less judgmental, especially when a behavioral health issue is involved. A doctor's understanding of what the patient is willing to do and isn't willing to do can help them to take baby steps to the end goal.

Can patient-centered care be taught? How can doctors be trained on the skills needed for patient-centered care? Teaching in this area can range from specific training to hidden curriculum in course work and the goals and policies of the institution. A basic skill of caring can be fostered by demonstrating. What this means is that some medical schools pair the teaching of relationship-building with the building of relationships at and between all levels, i.e. student and faculty. The study that found this was looking at teaching professionalism in medical school (Christianson, 2007). Data were collected from the students through examinations and self-reflections at mid-semester and end of semester. The resulting effects of greater professionalism were very similar to the goals of patient-centered care. These effects included quality communication between doctor and patient, showing empathy, and addressing the concerns of the patient (Christianson, 2007).

In the study done by Levinson *et al.*, they examined training that may aid in patient-centered communication. Physician's communication skills were measured using multiple methods including; interviews of patients, observations of doctors, and health outcomes of patients (Levinson *et al.*, 2010). The researcher outlined effective ways to teach these skills; by using a systematic method where students practice and then are given feedback on how to improve (Levinson *et al.*, 2010). The two studies looked at possible interventions that only went as far back as medical school, nothing before. It is hypothesized that classes that were taken in doctor's undergraduate education will influence their communication skills.

This study is interested in a potential intervention in undergraduate education for biomedical students. Interviews of doctors in the Northeast were conducted to obtain data concerning the effects of social science courses in biomedical undergraduate education. An understanding of behavioral science aids in proper diagnosis and treatment, but does it also aid in communication skills? Can early education in social sciences influence the way doctors communicate when they are in the field? It is hypothesized that a greater undergraduate education in social sciences will help doctors to understand human behavior and therefore have better communication skills.

## MATERIALS AND METHODS

Doctors in hospitals in the Northeast were contacted to participate in a thirty-minute to one-hour long semi-structured interview (Bourgeault, 2010). Approval from the Institutional Review Board (IRB) was obtained for this study before data collection began. The sample size consisted of six doctors: four females and two males. The interviews were recorded on a Sony ICD-BX140 and then transcribed using *VoiceBase*. Data analysis was run through *NVivo*. The data obtained from this program was combined with observations such as body language and a close reading of the interviews.

### Recruitment

Participants were recruited in different ways. First, calls were made to departments in a local hospital and family practices. In the hospital, the details of the study were discussed with the assistant for the department. If they thought doctors would be interested, an email would be sent to the assistant. The email would contain more information about the study along with the informed consent. From there, the assistants would send out emails to the doctors in the department. The assistant helped to set up an interview time with any interested doctors. For security reasons, the direct emails or phone numbers to the doctors were not given. This disconnect turned into a challenge, and only two participants were obtained using this method. After the interview, participants were asked to spread the word around to their coworkers to use the snowball effect to gain more participants. Unfortunately, this was also ineffective.

When family practices were called, the office manager was in charge and they were not often in and did not respond to voicemails. This lack of response proved to be a significant struggle in this study. Unless a doctor is known personally, there is no way to

access their email or phone number. Doctors are also so busy that they rarely respond to emails that are not about their patients. The other four participants were recruited through networking. While discussing the difficulties of obtaining participants, people began reaching out to doctors they know and giving them information about the study.

Networking turned out to be the most effective way to recruit participants.

The sample size was set to be six to ten participants based off the *SAGE Handbook of Qualitative Methods in Health Research* (Bourgeault, 2010). In this book, the authors discuss that six to ten participants in a semi-structured interview is enough to obtain redundancy in the data. Redundancy means that enough information has been gathered, that nothing new could be found (Bourgeault, 2010). People in the same job can have very different interpretations of situations, however, they may handle them the same way.

### Data Collection

Semi-structured interviews (Bourgeault, 2010) were selected as the method of data collection because main points around each doctor's undergraduate education and their experiences as a doctor could be discussed in depth. Semi-structured interviews allow questions that would draw out further conversation on a subject or expand upon an idea that the doctor brought up to be asked. The order of the questions was flexible, if the conversation was moving in the direction of a later topic, the interview would be adjusted to follow the stream of conversation.

The questions were created with the intentions of gaining insight into the doctor's undergraduate education, typical day at the hospital, normal interaction with a patient, and traits or skills they like coworkers to have. The semi-structured interview questions

can be found in Appendix A. The important points to hit when discussing the MD's undergraduate education were; their major, what they took for social science classes, and if they felt prepared for medical school. The dialogue was opened up by asking about what their typical day looks like. This set the stage for questions about patient interactions and coworker interactions. Questions about patient communication were created to learn how each doctor approaches difficult situations and what they think their most gratifying experience was with a patient.

Discussions about the participant's co-workers were designed to investigate what they thought were the most important traits to have in the medical setting. These data were not used in the analysis of the interviews. The data collected through these responses did not lead to new or useful information about the doctor being interviewed. Overall, the interviews were used to determine if the MDs felt prepared for medical school, what they thought could have prepared them better, how they interact with patients, and what skill they use most or look for most in co-workers.

### Data Analysis

In order to transfer the audio off of the recorder and on to the computer in an MP4 file, an auxiliary cord was used. The auxiliary cord was plugged into the headphone jack of the recorder and the microphone jack of the computer. An application, on a Windows laptop, called *Windows Voice Recorder*, was used to copy the recordings. Those MP4 files were then downloaded to a site called *VoiceBase* (Bachtiger, 2010). This website is a transcription service that uses the recordings to give a computer-generated transcription. All of the sound files were downloaded to the website and machine transcriptions were

returned within minutes. This application will not transcribe any filler words such as uh and um.

The transcriptions were not perfect and were manually edited to ensure that what was said was accurately reported in the transcript. Since *VoiceBase* produces computer generated transcripts, if participants spoke too quietly or mumbled, the statement would not be transcribed or would be incorrect. Fortunately the program provided an easy way to edit where if a word was right clicked, the recording would be played for that word.

The data was partially analyzed using *NVivo*, a qualitative data analysis program. This program gave a simple platform to code the interviews, visualize the words that were used the most in the interview and the frequency of the most used words in the interview. *NVivo* was used to examine the word frequencies and pick out the top-three content-heavy words. Content-heavy words are words that carry more significance to this study than words like “know.” Word frequency was combined with observations made during and after the interview about body language and first impressions of the doctor.

A rubric (Table 3) was also made to analyze the important concepts through the interviews. This was done by listening, reading, and annotating the interviews to find common themes. The eight themes that were mentioned frequently or stressed as being important were included. The transcripts of the interviews were then read again and each participant was rated zero to four on each of the constituents. During this process, the important concepts and points were taken out and highlighted.

## RESULTS

**Table 3**

Constituents examined around patient interaction. A scale of 0-4 was used to rate each subject on the level to which these areas were discussed in the interview.

0= Did not discuss. 1=Mentioned. 2=Moderately discussed. 3=Value. 4=Stressed.

<i>Constituents:</i>	<i>Subjects</i>					
	<b>#1</b>	<b>#2</b>	<b>#3</b>	<b>#4</b>	<b>#5</b>	<b>#6</b>
<i>Communication</i>	4	4	3	4	4	4
<i>Listening to Patient</i>	2	4	1	4	2	1
<i>Body Language (Patient)</i>	4	0	0	3	0	2
<i>Body Language (Doctor)</i>	4	2	3	3	0	0
<i>Education of Patients</i>	2	4	2	4	4	4
<i>Compassion/ Sensitivity</i>	2	3	1	2	2	2
<i>“Meet People Where They Are At”<sup>1</sup></i>	1	4	1	4	3	4
<i>Care for Patients</i>	4	4	2	3	3	4
<b>Total</b>	23	25	13	27	18	21

<sup>1</sup> Includes an understanding of their patient’s current education level to guide conversation when explaining health care. This also includes, realizing that when a patient is sick, they are stressed and at their worst.

**Table 4**

Each subject's undergraduate educational background and experience during undergraduate.

<i>Subjects</i>	<i>Major</i>	<i>Interdisciplinary (Y/N)</i>	<i>Approximate # of Non-Science Courses</i>	<i>Meeting People from Different Backgrounds (Y/N)</i>	<i>Desire to Have Taken More Social Science Courses</i>
1	Biology with Dance and Chemistry Minors	Y	At least 7	Y	N
2	Environmental Biology	Y	At least 5	N	N
3	Mathematics	Y	At least 6	Y	N/A
4	Chemistry and Physics	N	At least 3	N	Y
5	Biology- Cell and Molecular focus	N	At least 1	N	Y
6	Sociology, German, and Women Studies	Y	Almost all were not science courses	Y	N/A

**Table 5**

Word frequency data was used to determine the content-heavy words that were used the most during the interviews. This excludes common words such as; know, like, thing, get, etc.

<i>Subject</i>		<i>First</i>	<i>Second</i>	<i>Third</i>
<i>Average</i>	<b>Word</b>	Patient	People	Work
	<b>Percent</b>	1.62%	1.48%	0.73%
1	<b>Word</b>	Patient	People	Interaction
	<b>Percent</b>	1.56%	0.91%	0.62%
2	<b>Word</b>	People	Patient	Care
	<b>Percent</b>	1.89%	0.98%	0.96%
3	<b>Word</b>	Patient	People	Work
	<b>Percent</b>	3.26%	1.52%	1.09%
4	<b>Word</b>	Patient	People	Medical
	<b>Percent</b>	2.29%	1.54%	0.98%
5	<b>Word</b>	Patient	Family	Time
	<b>Percent</b>	1.76%	1.50%	1.17%
6	<b>Word</b>	People	Medical	Understand
	<b>Percent</b>	2.22%	1.51%	1.18%

### Communication and Listening:

All the participants saw communication as a key skill in the medical field. Communication can span from patients to coworkers to family members of patients. When asked what the most important skill used day-to-day, one doctor responded, “Well, I think communication skills are probably the most important” (Subject 6). This subject discussed using quality communication skills to educate their patients about what is going on with their medical issue and how they are going to fix it. All the participants either stressed or valued communication in their interactions with patients (Table 3). The one subject that valued communication, rather than stressed it, had one of the most interdisciplinary undergraduate educations (Table 4). This connection indicates that the courses being taken during undergraduate studies are not teaching communication skills.

Listening to patients is imperative, this is the best way for a doctor to know what the patient wants from their care. This skill was not something that each of the participants at least mentioned but was not as critical to some as it was to others (Table 3). Participants stated that listening is a necessary skill to have not only to determine the goals of the patient but also to learn about the patient. One doctor stated, “I was taught that you’re going to do a lot better by sitting back and just asking a patient why they are there and just shutting up and listening to what they tell you” (Subject 4). This method was something that the doctor said ended up saving them time in the long run. It is also a more personal way to obtain the information needed and makes the patient feel like they are heard and feel comfortable with the physician and their relationship.

### Body Language:

The body language of the doctor can have ramifications for the doctor-patient relationship. Body language can either build up or tear down trust between patient and doctor. One participant was discussing a resident they once had saying, "... he made a point of going to the room, introducing himself, sitting down, and talking to the patient. Being at eye level and not standing up looking down upon, you could see that there was a connection forming" (Subject 4). Another aspect of body language that other doctors discussed was the change in relationship that could occur with negative body language that suggests frustration or that the doctor is rushed. A doctor can pick up on these cues from observing patient body language as well.

A patient's body language can tell a doctor a lot about how the patient is feeling and how open they are to the doctor. Participants who discussed this noted this as a huge help when trying to educate the patient and gauge the relationship. The doctors look for signs of being confused or frustrated and will adjust how they are presenting the information as needed. One doctor noted, "Being able to read people and understand that they are already hyped up..." (Subject 1). This is key when entering the room to note the state the patient is in, this will allow the doctor give back the proper tone and body language to calm the patient. Another doctor mentioned how their ability to read body language helps them to know what the patient wants before they say anything. However, patient body language was not discussed as often as doctor body language (Table 3). This skill was noted as being very useful to those that talked about patient body language. The importance of this area suggests that there should be more education or training about understanding patient body language.

### Education of the Patient and “Meeting People Where They Are At”:

Educating patients so that they can make an informed decision is one of the main jobs of a doctor. This also includes the difficult task determining the education level of the patient and how to educate at that level. One doctor discussed an interesting strategy of using common examples to help the patient understand the condition. The participant said, “You put a patient on a blood thinner that they could bleed to death from and you’re trying to relate to that” (Subject 3). This doctor went on to talk about how a common occurrence that happens in our culture should be used, in this case it was shaving since, in the US, most men and women shave and have most likely cut themselves before. Making sure the patient understands the risks and benefits is very important in proper treatment. Education of the patient was a key skill that all the participants discussed (Table 3). Not all doctors approach educating their patients in a similar way to subject 3. Different methods are okay; however, some basics could be taught early on so that doctors could have a foundation moving into medical school.

“Meet people where they are,” can take on many meanings. In this case it is an understanding of the emotional state of a person, their education level, and the steps they are willing to take for their health. This was an important area for many of the doctors. When discussing stressful situations, participants noted that, sometimes the way their patients are acting is since they are at the hospital and they may not act like this under normal circumstances. Subjects also realized the need to meet the education level of the patient. They may have to go more or less in-depth in an explanation depending on what the patient knows about the issue being addressed.

Another aspect of this statement is the willingness to take certain steps to become healthy. This is most important in behavioral health issues. One doctor, when talking about obesity said, “I think asking the family for ideas, ‘well what do you think would work, I am not living in your house.’ ... Meet them where they are” (Subject 5). This idea was also reflected by other participants, trying to find out what the patient, and those around the patient, are willing to do in order to become healthy. Subjects talked about taking baby steps and offering the resources that could help make this process easier.

#### Compassion and Sensitivity and Care for the Patient:

This was addressed in a number of different ways by the participants. It was not something that was largely focused on in the interviews but each subject did at least mention it. This can be hard in the medical setting, to some extent doctors need to be hardened so that they can make the difficult decisions if that time comes. This also plays a role in communication and relationship building with patients. Compassion and empathy help to build better doctor-patient relationships. One doctor mentioned the importance of compassion and sensitivity despite time constraints. They said, “I think it’s trying to fit that [empathy] in those small spaces. You don’t have an hour to sit there and go through everything with the patient but at the same time you want to be sensitive and compassionate” (Subject 1). The participant is stressing how a doctor must explain everything to the patient in a short amount of time but does not want to leave the patient feeling as though the conversation was rushed or completely lacking feeling. Another piece of compassion and sensitivity is seeing a patient as a person. For all the participants, person was either their first or second most used content-heavy word (Table

5). This is significant because patient is linked to the hospital, disease, diagnosis, and treatment. Whereas people is a general term, showing that these two participants see their patients as people first, not the disease they are trying to treat.

Care for patients expands past the medical treatment that is given. It includes caring about a person on an emotional level. One doctor stated that, “I decided over time it’s probably one of our [doctors’] very important roles, is to help families have that experience [hospital visit] be as atraumatic as it can be” (Subject 2). This exhibits caring on a deeper level for each person that enters the hospital. For this participant, a deeper caring was important to the experience their patients have. “Care” was this participant’s third most used content-heavy word (Table 5). When having difficult conversations, this doctored noted how they would bring in people who could sit with the patient and their family after the doctor leaves to ensure the family has support and can fully understand what the doctor said.

Analysis based off the close readings of transcripts can be found in appendix B.

## DISCUSSION

### Data Analysis

After analyzing the information from the tables and close readings of the interviews, it was determined that the understanding of human behavior and communication skills may not be enhanced by a greater number of social science courses taken as an undergraduate. The data collected through this research was inconclusive, but anecdotal information gained during the interviews suggest that the development of interpersonal communication skills occurs throughout a lifetime, in experiences outside of the classroom that exceed the scope of this study. However, all the doctors cited lessons learned in their undergraduate education that have stuck with them through their professional careers leading to the suggestion of a new course being added to the pre-medical curriculum.

The doctor who has the highest score, subject 4, did not have a largely interdisciplinary undergraduate education. However, this participant is located at a hospital that does extensive holistic training. Subject 4 did state that much of their understanding in human behavior came from training on the job. They did also cite an undergraduate psychology course that is still reflected upon when trying to determine behavioral health issues. This is an example of how the doctors use their experiences from social science courses in undergraduate studies. This example suggests that it may not be the quantity but the quality of the education received.

On the opposite side, subject 3 scored the lowest and claimed to have had a classic liberal arts education. This subject discussed the many non-science courses and non-premedical student interactions they had. This doctor appreciated the education that

was gained in the liberal arts side regarding how to interact with people and the general background information. But this doctor was very stiff and difficult to talk to; it was hard to carry on a conversation and ask questions. This helps to show that having large numbers of courses outside of natural sciences does not equate to better communication skills. This also helps to show that experiences outside of the classroom may be needed to develop these skills.

The results of the other participants were similarly neutral, though there were a few statements that did stand out which helped to identify the importance of certain skills. The first was from subject 5 who had the second lowest score. When asked how many social science classes they took, they noted that they took one sociology course. They went on to state that they wished they had taken more social sciences during their undergraduate education. Subject 6 was a sociology, German, and women's studies major and expressed that their undergraduate education taught how to think and how to interact with the world. Subject 6 viewed this as more useful than a traditional science heavy education. Subject 1 felt that the arts that were taken as an undergraduate helped them to be more insightful and reflective which is an important quality to have in the medical profession. Finally, subject 2 had a large background in different religions, based on the vast numbers of religion courses taken during undergraduate studies. These courses help in cultural competencies and allow this doctor to see from many perspectives. The doctors also focused on some key skills used during patient interactions.

The information gathered through the interviews indicates that there may be a correlation with self-awareness. Many of the doctors were very aware of their patient interaction style. They were able to clearly state what a normal interaction looks like.

Observations and experiences with these doctors supports their self-reported techniques. Although patient interactions look much different than interviews, the interpersonal communication skills are the same.

The participant that stood out as the most closed off was participant 3. Although this subject took many courses outside of the natural sciences, conversation was very flat and uncomfortable. This observation plus the discussions with other doctors throughout the study lead to the conclusion that a new class should be required in the biomedical curriculum. This course would be focused on teaching undergraduates skills such as self-awareness, cultural issues and how to speak “like a human.” The learning goals can be found in appendix C.

Each of these goals would be a different unit in the class. This course will not only be designed to teach the skills but also educate how the skills can influence the patient’s experience with them. For each learning goal, the course will: introduce skill, teach clinical importance, exhibit good and bad examples, and finally practice. During practice, people will come in to act as patients for the students. The instructor will give feedback to each student on ways to improve. This approach allows for a give and take in the classroom and gives students the tools they need before entering the field.

### Current Research

Much of the current research does not look at direct ways to make doctors better. The research has discussed different methods that lead to better patient satisfaction, but they do not pave the way for this kind of care. The current research implies that training will occur later. Levinson *et al.* examined what training interventions may lead to better

communication; however, they only looked as far back as medical school (Levinson *et al.*, 2010). The point of this study was to see if there are factors from the start of higher education that will help to prepare and create more compassionate doctors who are able to communicate well with their patients. The study was meant to fill the hole and to discover if interventions as early as undergraduate education could aid in better patient-communication.

In the paper written by Prichard, neuroscience courses were a suggested way for pre-medical students to gain the necessary competencies for the new MCAT (Prichard, 2015). Neuroscience may not be enough according to the findings of this study. To create an intervention during undergraduate work, a new course is proposed. This course would be focused on teaching students valuable interpersonal skills. The structure of the class will reflect the method of teaching communication skills outlined in Levinson *et al.* In this article, the training was highly interactive including practice and feedback afterwards (Levinson *et al.*, 2010). This style allows students to try the skills they have learned in class and get constructive criticism on what they can do to improve. This is beneficial because a person may believe they are speaking in a caring and patient tone, however, they may sound annoyed and impatient.

### Limitations

One major limitation of this study was recruitment of doctors. Without knowing a doctor personally and having their personal contact, it is difficult to make first contact directly. What is meant by this is that there are gatekeepers: secretaries, office managers, department assistant. There is no way to access a telephone number or email address for the doctors. Everything is done through other people. This made it very difficult to

explain the purpose of the study to the doctors. It also made it difficult to pique the interest of the doctors in order for them to take the time out of their day to do the interview.

Another limitation of the study was that, for the most part, the doctors who participate in this study care. What is meant by this is that these doctors took time out of their very busy schedules to sit down for an interview. If these doctors care enough to take the time to be involved in a research study that has no direct benefit to them, that says something about the types of people they are, ones who takes the time to help others. Doctors that may not be as patient or as understanding of patients were not interviewed for this study. This means that the whole spectrum of doctors was not explored.

One issue that was not fully addressed in this study was the constraint of the doctor's time. Many of the participants mentioned this as being an issue, however, some noted that if the patient needed to sit and talk for a few hours, that they would make the time to do it. Other participants on the other hand, focused on the fact that they did not have enough time in the day to do all the things they needed to do. This may be another area to explore in terms of a potential shift in patient interactions when no time constraint is present. This will help to distinguish if there are problems in the training or in the amount of time spent with the patient.

All the doctors who were interviewed went to different medical schools. This added variation in the kind of training they received. Some doctors mentioned how they received ample training in patient interactions, however, that was not common in medical schools at the time. If a doctor had an undergraduate education that was not interdisciplinary or had no social science courses but received quality patient interaction

training in medical school, then they may see no need for a change in their undergraduate education. While another doctor may have had an extremely interdisciplinary undergraduate education but their medical training did not focus on patient interactions so they may rely fully on the education they received in undergraduate studies. If all the doctors went to the same medical school, comparisons about undergraduate education would be much more concrete especially with many medical schools shifting their training.

One doctor noted that they help to teach third year medical students saying, “You want to build a rapport with patients and you don’t build rapport with patients by telling them where you went to medical school and spouting medical facts. You build a rapport with people by talking to them like normal human beings” (Subject 3). This participant discussed how they would act like a patient and any time the student used medical terms, the patient’s reaction or demeanor would change, in hopes to train the medical student to speak like a human being. Medical training is shifting at different rates, it is important to have consistency in this training to understand the full impact of undergraduate studies.

### Future Studies

In future studies this research should be done with a larger sample size to gain a wider variety of educational backgrounds. To examine this topic further, medical students who have just entered residency should be interviewed. This method may give a better idea of how the undergraduate social science classes did or did not have an impact.

Interviewing after residency begins would give insight into how prepared residents felt

through medical school and if knowledge gained in medical school or undergraduate were more or less useful when starting residency and interacting with patients.

Groups of doctors who went to the same medical school should be examined to take out the variable of different training at that level. Many of the doctors discussed that they had a good medical school training and felt prepared for patient interaction after, but believed that others may not have had training like such. But studying doctors who attended the same medical school, it may be easier to see difference that could correlate to nature of their undergraduate education. In this study, there were many variations of where the doctors attended undergraduate school, medical school, and residency; this creates speculation for where the training for patient interaction occurred.

In this study, social science courses in undergraduate education could not be directly linked to better patient-satisfaction or communication skills. Much of the knowledge of behavioral health was gained when they started their careers or through their upbringing. At the same time, all the doctors cite lessons they learned through undergraduate work that they still carry with them today. These lessons lead to a proposed curriculum change for pre-medical students.

This change adds at least one sociology course that covers basic interpersonal communication skills that are needed as a doctor. This interactive course will teach students the key skills doctors use in patient interactions. The course will emphasize the importance of each skill while giving students an opportunity to practice the skill and gain feedback. As changes have been made to the MCAT, undergraduate students will be taking more social science courses to prepare for the new behavioral psychology portion

of the exam. The new suggested course will not only help to prepare them for this section of the MCAT but will also be useful in their practice.

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## APPENDICES

Appendix A. Semi-Structured Interview

Q1: What does a typical day look like for you?

Q2: How does a normal interaction with a patient go?

- a. How much time do you spend with them?
- b. What is the most gratifying experience you have had with a patient?
- c. What has been the most frustrating, or challenging experience you have had with a patient?
- d. Do you feel like your medical training prepared you for these interactions?  
Why?

Q3: Without using any names, is there any particular co-worker you enjoy working with most and why?

Q4: Again without using names, is there any particular co-worker you find most challenging to work with and why?

Q5: How did your understanding of human behavior develop?

Q6: Tell me about your undergraduate education.

- a. Where did you attend undergrad?
- b. What was your major?
- c. Did you take classes to prepare for the MCAT or for medical school?

Q7: How many social science classes did you take?

a. Did you find them useful? Interesting?

Q8: Did you feel like you were prepared for medical school?

a. What do you think you could have used, in terms of classes?

Q9: On a day to day basis, what skills that you learned in your training do you feel you use the most?

## Appendix B. Analysis of close readings of interview transcripts

### Subject 1

Subject 1 was slightly off-putting at first; they had a hard-outer shell. The subject seemed unapproachable, but once the interview began, conversation and questions flowed naturally. Subject 1 majored in biology but minored in dance. This doctor did not take many psychology courses, other than the basic introduction to psychology course. When asked if more social science classes would have helped prepare them for medical school, this subject said that they felt like they were not needed. However, understanding the basis for human interaction may be helpful for others, in this doctor's opinion. Subject 1 believes that most knowledge of human behavior and interactions developed through life, through experiences from childhood to professional career. Subject 1's experience in dance was very significant. The dance minor was not added on until much later in undergraduate school when this doctor was feeling like they needed something else. The premedical track was described as being "very isolating," which can cause a person to miss out on a lot of things. Subject 1 was thankful for the dance minor because it gave them the opportunity to learn how to express themselves in different ways. This also gave subject 1 a lot of exposure to different kinds of people that may not have experienced otherwise. Dance also helps to teach how to pick up on other people's nonverbal cues.

Body language was one of the biggest things that subject 1 discussed as an important skill to have in a health profession. It was noted that they read people to determine what their level of knowledge is. This can give subject 1 a good idea of how in depth they need to be in the explanations of health concerns and treatment plan options. This doctor also expressed how body language is used to examine the patient and their

mood before they start talking. This helps set the stage for how this doctor feels they need to act around that patient, if they need to be more direct or in-depth. This participant believes that it is a doctor's job to advise and guide the patients to the best of their abilities to give the best care that is right for the patient. Subject 1 finds it important to give power and control to the patient. It is important that the patient is happy with the care that they have received. Subject 1 expressed that the most frustrating interactions with patients are ones in which the medical team can't do what the patient expects from them due to a general lack of knowledge about what is occurring in the patient's body.

For subject 1, the skill used the most on a day-to-day basis is communication and being able to read people. Not only was this the skill that was pointed out when asked, but these were also the skills that were discussed most through the whole interview. Body language, reading people, communication, and listening were all important for forming a relationship with her patients.

### Subject 2

During the first impression, subject 2 was slightly intimidating because it was very easy to see that they were confident and extremely intelligent. When the interview started, the subject was very easy to talk to and it was clear they have a passion for people. Subject 2 majored in environmental biology in undergraduate and took very little in terms of social science courses. However, their education was enhanced by art and religion courses. Subject 2 felt as though undergrad taught them to think critically and to meet people from all walks of life. They did not feel prepared for medical school in terms of psychology, and they felt like medical school did not do enough to teach

socioeconomic issues. This was an issue that the subject believed would be too far removed to teach in undergraduate. Through the interview it was mentioned a few times that there should be more psychology and psychiatry education around how social issues affect health. This subject felt as though their understanding of human behavior came from life experiences and in their time in their profession.

This subject believes that patients should have as much information as they can if they want it. The doctor stressed that meeting the patient where they are is extremely important. If a patient is not ready to take the next step for their health they will not put in the effort that is required to truly be healthy. Meeting a person where they are is also important when dealing with end of life. Subject 2 felt that if they are providing care to someone that is not going to last much longer no matter what, they feel that the care is something they are doing to the person rather than for them. While at the same time this doctor believes that one of the most important roles of a doctor is to ensure that the hospital visit is as atraumatic for the patient and the patient's family as possible. How this doctor makes sure this happens is by taking the extra time with patients. This subject has had a lot of personal experience with the medical field and has found it is doctors who take the extra time to explain the procedure or the treatment plan that make the most impact. They have found by doing that the family of patients benefit from having someone to talk to which is difficult when everyone they know is going through the same thing. This doctor talked about how they will sit with patients and family members or find someone to sit with them if they need the extra support. This doctor said that it is important to be human as well as a doctor.

Subject 2 touched on the issue of lack of access to health care and how horrifying it is that not everyone has access to the care they need. In the interview, the subject discussed how it is handled when there is a patient who cannot afford the care. The doctor noted that there are systems in place to help the patient's pay for their care. Subject 2 tells their patients that whether they pay or not is not known to them. This doctor came off as extremely socially aware. However, on a day-to-day basis, this doctor expressed that the technical skills they learned is what they use most. But subject 2 went on to describe the importance of pre- and post-op care education.

### Subject 3

Subject 3 was very stiff and down to business. Through the interview they were very direct and plain spoken. This is also how this doctor described their interactions with patients. This doctor studied mathematics for their undergraduate degree and expressed that it was a classic liberal arts education. This subject spent a lot of time with education majors since many people in mathematics were going in to education. This doctor has also seen from coworkers and residents, that those with a varied educational background do better with patient interactions. The doctor sited the success to the fact that they have a better understanding of cultural history and medical history.

This doctor discussed that it is important to educate the patient and gain their trust. Subject 3 gives patients the time to ask questions which allows this doctor to understand where the patient is coming from and where their education level lies. This subject also stressed talking to the patients like they are people and be able to talk to them as a human and not in doctor speak. The doctor typically has an agenda with the patients

but also sees the importance of hearing their concerns for their health. This doctor noted that the most important skill that is used day-to-day is communication and being a good listener.

#### Subject 4

Subject 4 was very welcoming and approachable. This doctor made very good eye contact and had open body language. For an undergraduate major, subject 4 studied chemistry and physics and did not take much in the way of social science. Though, they did mention one psychology course that they took, and this was something that this subject looks back on when trying to figure out potential behavioral problems that may be occurring. However, this class was not enough in this doctor's opinion, especially not enough to prepare them for the patient interactions of medical school and through their career. This doctor also did not feel like enough training was received in terms of psychiatric illnesses. A bulk of this subject's understanding of behavioral psychology developed through training in their career.

When subject 4 is treating a patient, they try to look at the patient's whole environment in order to give the best treatment and something that they will be able to afford. This doctor also works to impress upon the patient how important their health is. To determine where a person stands on how much a person wants to be as partner in their health, the doctor will ask questions to gauge the patient's knowledge level and readiness to change. From there the doctor tries to stay open-minded and adjust to the needs of the patient. Relationship building and trust is key to the way this doctor practices. Part of relationship building is listening, which is something this subject found was a key skill.

This doctor mentioned that you can learn a lot from a patient by “just shutting up.” The skills this subject said they use the most day-to-day would be listening, being observant of body language, and working together.

### Subject 5

Subject 5 was very friendly and had a laid-back feel due to body language. Through the interview it was clear to see that this doctor is very thoughtful. Subject 5 focused on biology and more specifically cell and molecular biology in undergrad. This doctor did not take any social science course, however, expressed a desire to have taken some while in undergraduate. This doctor felt like there was not enough education in medical school on child development and had wished these classes had been taken during their undergraduate schooling. Subject 5 did feel like undergraduate school taught them how to deal with people. This doctor’s understanding of human behavior stemmed mainly from their training in medical school and in residency.

Subject 5 tries to make sure that the needs and wants of the patient are met, however, finds it difficult when the patient wants one treatment that will not do anything to help in the current disease state. This is challenging because this doctor wants to ensure that their patients are pleased with the treatment that is being administered, but they cannot prescribe an anti-biotic for a cold. This doctor tries to educate patients and families to increase the wellness of the patient so they can understand the importance of lifestyle changes for their health. Building relationships is one thing that helps this doctor to educate and meet the patients where they are in order to find a do-able solution for any health issues that could be treated by making a behavioral/environmental change. Subject

5 cited multitasking and time management to be the most important skills that are used day-to-day.

### Subject 6

Subject 6 came across as very welcoming but professional and intelligent. Their undergraduate major was sociology, German, and women's studies. This doctor worked in public health before deciding to go on to medical school. They focused on medical sociology for this line of work. After a stint in public health, the subject wanted to have the skills to be the one giving the treatment, to be the doctor. The undergraduate education, however, served as a way to learn how to think and about the world which in the subject's words are "just as important as the background sciences." This doctor believed that their undergraduate education was beneficial because it helped them to understand people and human interactions. The foundation for understanding human behavior stemmed from their undergraduate education but also from parents and life.

When this doctor goes in to see a patient, they first introduce themselves and go through an explanation of what is going with the patient to ensure they understand what has happened with their care up to this point. Subject 6 finds this important because doctors do not always communicate well or in a way that the patient understands. This subject enjoys using their communication skills to find out what the patient's goal of the care is and to implement that in the best way possible. This doctor will spend as much time as needed with the patient to make sure that they understand what is going on and is satisfied with the treatment. This doctor finds it important to know the patient's knowledge level because this helps in explaining at the correct level for the person.

The most important skill that is used day-to-day is communication and understanding people. This doctor said that the reason, they believe, people do not like doctors is because they do not get the connection to the physician that they desire. This doctor said, “What is missing in medicine often, I think, is an understanding of people.” Subject 6 also discussed how after looking at a patient, by their body language/ facial expressions, they already know what the patient needs. These sorts of interactions are ones that this subject believes are hard to teach.

### Appendix C. Learning Goals for New Course

1. Self-Awareness- this will be an important skill through the whole course which will allow you to learn from mistakes and improve for the future.
  - a. Body language- understand the importance of doctor's body language and the effect it can have on patients. Be aware of and control body language.
  - b. How to speak to patients- notice your tone of voice, sound sympathetic and knowledgeable.
2. How to read people- this can help you understand how a person is feeling before you begin to speak to them. This will also help determine if you need to change your approach while talking to a patient.
  - a. Non-verbal cues- pick up on body language such as; fidgeting, sweating, facial expressions, etc.
  - b. Tone of voice- notice if the patient is worried, content, distraught, confused, or if their mood changes.
3. Relating to others- this will help connecting to patients and building up a trust.
  - a. Cultural context- understand different cultures what may be important to them in terms of their medical care. Also understand where they are coming from in order to honor their cultural norms.
4. Teamwork- this skill is not only important for a positive work environment but also for ensuring that the patient taken care of.
  - a. Call in others to help with difficult conversations- give more support to the patient even after you have left the room.

- b.** If a patient does not respond to you, recommend another doctor- know when you are not clicking with a patient and recommend another doctor so that the patient can get the best care possible.
- 5. Being a human- during medical school you will learn to speak like a doctor, however, it is important to never forget how to have a conversation with someone who does not have the same level of education.



### AUTHOR'S BIOGRAPHY

Kathryn Asalone was born in Bangor, Maine on August 23, 1995. She was raised in Hampden, Maine since she was nine years old and graduated from Hampden Academy in 2013. Majoring in zoology, Kathryn has a minor in neuroscience. She has been a member of Sophomore Eagles, All Maine Women, and the Honors College Student Advisory Board. She is a member of Alpha Lambda Delta and Phi Beta Kappa. She received the Carolyn E. Reed Pre-Medical Fellowship for her thesis research.

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