Medical Professionalism for the 21st Century: An Examination of the Role of Pre-Professional Education

Jonathan de Olano
Michael Fost (mfost1@student.gsu.edu)
Dr. Ruth Parker
ABSTRACT:

Introduction: Medical professionalism education is an important component in training new physicians with ethical standards and high moral character. While there is a lot of emphasis placed on medical professionalism during medical school and residency training, there is no emphasis during pre-medical undergraduate education. Instead, pre-medical education has been criticized for negatively impacting future physicians in creating a highly competitive, dehumanizing, and non-altruistic culture. This Discovery project examines the impact of a formal curriculum on medical professionalism to undergraduate pre-medicine and pre-health students. Given the limited literature on the subject, the project also consist of semi-structured interviews with national leaders of the medical profession to qualitatively identify consistent themes regarding pre-professional education and its role in medical professionalism.

Research Hypothesis: Students who complete the “Medicine and Compassion” course and Italian cultural immersion will demonstrate higher scores on a validated instrument, the Global Perspective Inventory (GPI), reflecting improved self assessment of cultural competency, awareness of personal values, and acceptance and comfort in relating to others when they are compared to a cohort of similar students who complete an undergraduate on-campus semester course in Italian Studies.

Study Design: Qualitative component: semi-structured interviews lasting 30-45 minutes were conducted with six leaders in the medical field. These were transcribed and analyzed for themes regarding the role of medical professionalism in pre-medical education. Quantitative component: examine the GPI data from 2 Emory student cohorts, both of which completed pre- and post- course GPI assessment. The “intervention” cohort completed a course called “Medicine and Compassion.” The comparison cohort is a group of Emory undergraduate students tested on campus before and after a semester course in Italian Studies.

Results: Medical leaders describe medical professionalism education to be an exceedingly important component to medical education, and it begins prior to entering medical school. Undergraduate students who completed the course had an improvement of 6.7%, p value of 0.004, in GPI scores compared to the control cohort.

Conclusion: A formal curriculum in medical professionalism can positively impact growth among undergraduate pre-medical students. Further studies needed to determine impact in medical professionalism in medical school and residency.
INTRODUCTION:

As medicine has encountered growing skepticism by the general population, medical professional education has become a more important component in training future physicians. Whether it is the commercialism of medicine, physician scandals, or physicians’ placing personal interests over their patients’, there is growing mistrust between patients and their physicians. It is damaging not only to medicine but also to public health and the rest of the scientific community. Mistrust between medicine and society has led to adverse outcomes, including lower vaccination rates among elderly, decreased cancer screenings among the Hispanic population, and lower rates of advance care directives and hospice use among African Americans. The development of virtuous and professional physicians is important to redirect the growing skepticism in the medical field. Thus there remains a constant need for medical schools and residency programs to engage and teach medical professionalism.

The Charter on Medical Professionalism was developed in partnership between European Federation of Internal Medicine, The American College of Physicians-American Society of Internal Medicine, and the American Board of Internal Medicine to define principles and values of physicians in the practice of medicine. The three fundamental principles defined in the Charter, a commitment to the primacy of patient welfare, respect for patient autonomy, and a belief in social justice, all rely on a broad understanding of humanity, human behavior, and excellence in communication. At an educational level, the Charter has made authors challenge medical education to include the elements of the charter in medical school curriculums as well as look for attributes such as altruism in admissions decisions.

Numerous studies examine how different programs within residency and medical school education engage in medical professionalism, yet there are none that we were able to find from our literature review that examined medical professionalism education for undergraduate pre-medical students. It is important to consider not only training residents and medical students in medical professionalism, but also to focus on pre-medical undergraduate students as well. Residents and medical students have long work hours and demanding course work that may impede them from taking medical professionalism as seriously as they may need. Unprofessionalism may also be difficult to correct once in medical school. According to Brokaw and colleagues, medical students who are found to be unprofessional are more difficult to improve through remediation and have higher rates of expulsion. One way to improve medical professionalism would be to place more emphasis on undergraduate education and the recruitment process of future medical students.

Soon after the Abraham Flexner report in 1910, a premedical curriculum was established to better prepare students for medical school. Its core science courses included physics, chemistry, and biology, and the core course requirements have gone largely unchanged over the past century. Yet recently some courses in the core curriculum, including organic chemistry and physics, have been criticized for lacking relevance for clinical medicine. Others have contemplated the significance of a hidden curriculum within pre-medical education that affects what students know, how they know, and “who they are.” For a profession that values integrity, altruism, and professionalism, premed culture has been scrutinized for the opposite qualities. The
culture of premedical students, also known as “premed syndrome,” has been criticized for being highly competitive, dehumanizing, and lacking sociability.\textsuperscript{11} It has even been argued that undergraduate education negatively impacts the moral and professional development of future physicians.\textsuperscript{10}

While most studies of medical professionalism focus on medical school and postgraduate education, very little published literature has examined the preparation of medical students for professionalism. The curriculum prior to medical school can also influence how future doctors embrace professionalism and how they understand and display their moral character. As a result, authors such as Gross and Dale argue for a change within the premedical curriculum.\textsuperscript{10, 12} The American Association of Medical Colleges (AAMC) recently announced the first change in 21 years to the Medical College Admissions Test (MCAT). Two new sections will be included to focus on prospective medical students’ knowledge of psychological, social and biological foundations of behavior and also on their reasoning skills and critical analysis.

With these new changes taking place at the undergraduate level, it is important to engage in studying pre-medical education to improve medical professionalism of future doctors. The literature suggests that the premedical culture lacks professionalism, empathy and altruism, and may impact their professional development.\textsuperscript{10, 11} Work done for this Discovery project is the first of its kind by examining qualities that relate to medical professionalism in a cohort of undergraduate students contemplating careers in health.

If students are engaged in a curriculum that addresses components of medical professionalism prior to entering medical school they will be more attentive to the values of medical professionalism and hopefully more receptive to developing their own values that are well aligned with those of the profession. With 43\%\textsuperscript{14} of all premedical students eventually entering into medical school it would be a worthwhile endeavor to have a premedical curriculum incorporate components of medical professionalism.

As our hypothesis: Students who complete the “Medicine and Compassion” course and Italian cultural immersion will demonstrate higher scores on a validated instrument, the Global Perspective Inventory (GPI), reflecting improved self assessment of cultural competency, awareness of personal values, and acceptance and comfort in relating to others when they are compared to a cohort of similar students who complete an undergraduate on-campus semester course in Italian Studies.

### MATERIALS AND METHODS:

This project used mixed methodologies of qualitative and quantitative research to explore undergraduate education and its ability to teach students curricular components of medical professionalism. With no published reports on this topic, semi-structured interviews were used to examine critical themes from opinion leaders regarding medical professionalism to help guide quantitative research and complement quantitative data findings.
Qualitative Research:

For the qualitative component of the project, semi-structured interviews were performed with the following leaders in medicine:

Arthur Kellermann, MD, MPH Vice President, the RAND Corporation; Director of Health; Santa Monica, CA
Paul Schyve, MD Senior Advisor, Quality Improvement of the Joint Commission (1993-2011 Senior Vice President of the Joint Commission); Chicago, IL
Matthew Wynia, MD Director, Institute for Ethics, the AMA; Chicago, IL
Robert Copeland, MD an author of Charter on Medical Professionalism (chair emeritus President, the American College of Physicians board of regions); Lagrange, GA
Tom Lawley, MD Dean, Emory University School of Medicine (past President, AAMC)
Wright Caughman, MD EVP Health Sciences, Emory University

Interviews were performed in person and lasted 30 to 45 minutes. Each was recorded using an iPhone and later transcribed. Two interviews were not recorded due to lack of equipment but detailed notes were created directly from the interview. The following nine questions were asked during the interviews:

1. How do you define medical professionalism?
2. In 2002 The Physician Charter was developed by the Medical Professionalism Project and summarized that the fundamentals of principles of medical professionalism lied in: a. Principle of patient welfare, b. Principles of patient autonomy, c. Principle of social justice. Regarding the Charter, how has medical professionalism change over your career and over the past decade (or not) and why?
3. What do you expect in medical students regarding medical professionalism?
4. When does education for medical professionalism ideally begin? Why then?
5. Does pre-medical education hinder or foster ethical and professional behavior for future physicians? What needs to change?
6. For medical students, should medical professionalism be apart of the hidden or formal curriculum? Why?
7. Who do you most look up to in medicine? Why? What lessons have they taught you about professionalism? [Who was the 1st person in the context of medicine to make you see that it matters?]
8. Is there anything else we didn’t cover?
9. Who are you and what do you do?

Quantitative Research:

There are no standardized or validated tools for measuring medical professionalism in pre-medical students. As a result, the Global Perspective Inventory (GPI) was used as a proxy to measure quantitative student growth in domains related to medical professionalism. The Global Perspective Inventory is a validated instrument that examines holistic growth of college students. The tool was developed by Dr. Larry Braskamp of the University of Illinois, and purchased for one year’s use as an
educational research tool by Emory’s Italian Studies Program Director, Dr. Raggi-Moore. Since its development in 2008, the GPI has been administered to 18,000 students in over 100 colleges.

The GPI is comprised of three different scales that measure cognitive, interpersonal and intrapersonal dimensions of a student. The cognitive dimension accounts for a student’s ability to understand “what is true and important to know.”\textsuperscript{15} The intrapersonal dimension examines a student’s self identity, personhood, and emotional intelligence.\textsuperscript{15} Lastly, the interpersonal scale examines a person’s sense of social responsibility and “degree of engagement with others who are different from oneself.”\textsuperscript{15} These combine to form a questionnaire with 65 different items and use a 5-point Likert scale for each question. Given that the fundamental principles from the Charter on Medical Professionalism\textsuperscript{5} (i.e. patients’ autonomy, patients’ welfare, and social justice) require elements of the three scales measured by the GPI, it is the closest tool to measure medical professionalism in undergraduate students. Yet the GPI doesn’t directly measure medical professionalism and therefore is used as a proxy.

Two cohorts composed of Emory undergraduate students were obtained during the summer and fall of 2011 by Dr. Ruth Parker and Dr. Judy Raggi-Moore. Each completed pre- and post- course GPI assessment. The study required an IRB approval and signed consent by each of the participants. The “intervention” cohort of 37 students completed a six-week course called “Medicine and Compassion” which teaches components of professionalism. The intervention group was also apart of a cultural immersion Italian Studies course in Italy. The comparison control cohort was a group of 39 Emory undergraduate students tested on campus before and after a semester course in Italian Studies. Two additional cohorts were going to be obtained for the summer of 2012, but due to a lack of funding for the GPI they could not be performed.

Analysis of the data from the GPI was performed with aid of Michael Fost, a statistician in the Division of General Medicine. R was the statistical language used to perform the analysis for the quantitative component. A Q-Q plot and histogram plot were used to examine whether the data was normal. A t-test was performed to analyze the two cohorts using two tails with a p-value set at < 0.05.

RESULTS:

Qualitative data:

During the semi-structured interviews with leaders in medicine, several themes appeared and are summarized in Table 1. The first finding was the term “medical professionalism” had many different definitions among the interviewed. Some of the descriptions included: altruism, following an oath, “truthfulness and integrity,”\textsuperscript{16} privilege to serve,\textsuperscript{17} technical competence, “doing the right thing,”\textsuperscript{18} and “service beyond self.”\textsuperscript{19} These qualities were seen as important for maintaining a sense of mutual trust with society. Physicians have a responsibility to maintain ethical medical standards and place patient interest over their own.\textsuperscript{18}

Medical professionalism involves the entire health care community. As Dr. Caughman described, “professionalism […] goes beyond the patient and self and your colleagues, it extends to the next level in healthcare in general.”\textsuperscript{17} In a similar way the
Dean of Emory School of Medicine, Dr. Lawley, explains that “professionalism doesn’t start with the patient but doesn’t end with the patient, it also has to do with the relationships that we have with healthcare professionals.”

Another finding was the role of the importance of understanding individual physician’s role within the context of the healthcare system as a form of professionalism. As part of the Joint Commission, Dr. Schyve explained how “the concept of professionalism in medicine was focused on individual behavior […] we now understand in what we do in system terms and we are part of the system.” The obligation of the medical provider is not necessarily to the individual patient, but to the entire system in order to improve patient safety. According to Dr. Wynia at the AMA, the model of medical professionalism focused on the individual “has failed us.” The emphasis must shift to how each physician and healthcare provider is apart of the larger system, instead of the physician-patient model. Additionally, physicians should be trained to think in terms of systems through “training within teamwork.”

A common finding was when does medical professionalism begin to develop. All interviewees described the beginning of development occurred prior to entering medical school or residency. It was thought to begin during the early stages of their life, for example as “toddlers.” In the words Dr. Lawley: “It probably started at your mothers side and in kindergarten.” Echoing that sentiment, Dr. Art Kellermann, the Director of Health at RAND explains that medical professionalism begins by “age two or three, but at least by kindergarten […] I’m serious!” Furthermore, Dr. Kellerman worried that “if you don’t know [medical professionalism] when you get there, [medical school,] it’s too late.” Medical schools should reinforce professionalism to prevent students from being “abused or seduced out of it.”

Respondents differed with regards to pre-medical education and its role in the development of virtues desired for future physicians. Some were disturbed by premedical education and described it as being significantly flawed and outdated: “We are teaching a science curriculum for the early 1900s.” Others, like Dr. Copeland, were hopefully optimistic stating, “I personally think that liberal arts education is a moral enterprise.”

Another theme that was discussed was the role of the hidden and formal curriculum of medical professional education. All respondents acknowledged the need for both forms of curriculum. They described that during their education and training in the 70s and 80s there was no formal component to medical professional education, and yet were very adamant of it being incorporated. Interestingly, respondents remember moments in their education where the hidden curriculum was most impactful on their development as physicians. Dr. Kellermann, for example, described Dr. Paul Beeson at holding each of his patients’ hands at the bedside for over 30 minutes and later how he would “write a note about the person” with some medical recommendations added into the note. Dr. Copeland described his interactions with Dr. Tinsley Harrison and his ability to incorporate his love for literature and the arts when caring for patients. Additionally, both Dr. Copeland and Dr. Lawley described the importance of mentorship and role models for trainees’ education in professionalism.

Lastly, all respondents found that the topic of medical professionalism education to be exceedingly important in the training of future physicians. Collectively they stated that changes in the medical profession, healthcare, the rise in medical student debt, and the influence of conflicts of interest to be impacting professionalism standards.
Quantitative data:

The tested and control cohort involved 37 and 39 undergraduate students with mean ages of 19 and 20.2, respectively, who participated in the study. Demographic information of the students who participated in the study is shown in table 2. A Q-Q plot was done using the data to illustrate normal data distribution (see appendix).

The GPI evaluates based off a 5-point Likert scale. The average score for 65 questions demonstrated the average initial scores between the intervention and control group at 3.686 and 3.648, respectively. These were not statistically significant differences with starting scores. For the intervention group the score post course was 3.933, an increase of 0.247 or 6.70%. The score changes for the 1<sup>st</sup> and 3<sup>rd</sup> quartile were 0.100 and 0.425, respectively. On the other hand, for the control group the average final score was 3.603, with an average change of -0.045 or -1.23%. The 1<sup>st</sup> and 3<sup>rd</sup> quartile scores changes were -0.287 and 0.225, respectively. The standard deviation of the change in scores between the intervention and control group were 0.1956 and 0.4927, respectively. Using the Welch Two Sample t-test to examine the differences in scores between the two cohorts, \( t = 3.0418, \text{df} = 37.003, \text{p-value} = 0.004306, \) with a 95% confidence interval of 0.0975 and 0.4866.

The data from the GPI indicate that there was a statistically significant difference between the intervention cohort compared to the control cohort. There was a 6.7% increase in GPI score with a p value of 0.004. Additionally, the standard deviation between intervention and control were 0.196 and 0.493, respectively, illustrating not only a larger increase in overall scores but also a smaller variability in scores among those in the intervention cohort.

Given the statistically significant difference between males and females in the two groups, additional analysis was used to separate potential gender bias. The mean change in pre and post participation in the course by female students was 0.233 and -0.111 for interventional and cohort groups, respectively. The Welch Two Sample t-test for females resulted in \( t = 2.7478, \text{df} = 15.638, \text{p-value} = 0.01452, \) with a 95% confidence interval of 0.0782 and 0.611.

<table>
<thead>
<tr>
<th>Table 2:</th>
<th>Intervention Cohort</th>
<th>Control Cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of participants</td>
<td>37</td>
<td>39</td>
</tr>
<tr>
<td>Male</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Female</td>
<td>17</td>
<td>29</td>
</tr>
<tr>
<td>Age mean</td>
<td>19</td>
<td>20.2</td>
</tr>
<tr>
<td>Avg. Initial Score</td>
<td>3.686</td>
<td>3.648</td>
</tr>
<tr>
<td>Avg. Final Score</td>
<td>3.933</td>
<td>3.603</td>
</tr>
<tr>
<td>Avg. Change</td>
<td>+0.247</td>
<td>-0.045</td>
</tr>
<tr>
<td>% Change</td>
<td>6.70%</td>
<td>-1.23%</td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; Quartile</td>
<td>0.100</td>
<td>-0.2875</td>
</tr>
<tr>
<td>Median</td>
<td>0.2357</td>
<td>0.0250</td>
</tr>
<tr>
<td>Mean</td>
<td>0.2471</td>
<td>-0.0450</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; Quartile</td>
<td>0.4250</td>
<td>0.2250</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>0.1956</td>
<td>0.4927</td>
</tr>
</tbody>
</table>
males the mean difference was 0.291 and 0.0125 between the interventional and control groups, respectively. The t-test results for males was $t = 1.8058$, $df = 21.395$, $p$-value = 0.08504, and a 95% confidence interval of -0.0418 and 0.598.

Examining for gender bias showed that there was a statistically significant difference in scores for female participants in the two groups, $p$ value = 0.01. For male participants, on the other hand, score differences between the two cohorts did not attain statistical significance, $p$ value = 0.08. But due to the smaller male participant size, the study lacked enough power to determine statistical difference between the two, though they were approaching.

DISCUSSION:

In summary, leaders in medicine see medical professionalism as exceedingly important component of medical education. The qualitative findings from the semi-structured interviews illustrate the following regarding medical professionalism:

a. Medical professionalism is needed to maintain medicine’s contract with society.

b. Future physicians must understand medical professionalism within the context of the healthcare system.

c. Medical professionalism begins before medical school and it should be taught throughout their education—including undergraduate pre medical education, medical school, and residency—by both formal and hidden curriculums.

The findings from the quantitative portion of the study demonstrate that the intervention group of undergraduate students who participated in a course on “Medicine and Compassion” that formally incorporates curriculum on medical professionalism and a cultural immersion study abroad program had a 6.7% increase in their GPI scores compared to a change of -1.23% among the control group, with a $p$-value = 0.004306.

The first strength of the study was utilizing a mix methodology method for acquiring data. Qualitative data was used to both guide the quantitative data as well as highlight the quantitative results. A second strength was being able to quantify medical professionalism using a standardized instrument that compared our target population to a national database for undergraduate development. The GPI has over 18,000 college students from over 100 colleges to compare the data. The third strength was having a case-control study that demonstrated a very significant change in the intervention group compared to the control. The last strength to the study was the lack of literature in this field. This is the first study of its kind that specifically targets pre-medical education of professionalism.

There were a variety of weaknesses to the study as well. Having a small homogenous population study does not allow us to make generalizations for the pre-medical students across the country. The major confounding variable for the study was having two components to intervention group, which included a Medicine and Compassion course that occurred in the setting of a cultural immersion program. In order to isolate these two a further study would have to examine each component separately, in order to avoid this confounding variable. Lastly, a significant weakness to the study was
the lack of a validated tool to examine medical professionalism. The GPI is a validated instrument that has been used on college aged participants and captures some components of professionalism, such as intrapersonal and interpersonal development, but there is no validated instrument to measure professionalism directly. The only other tool for measuring medical professionalism in the literature is the “Clinical Conscientiousness Index,” or CCI. But unlike the GPI, the CCI was only used in a small cohort of 124 third year medical students. Thus, the GPI, while only a proxy, has a larger database to compare with our target population.

There are several significant implications to this Discovery project. Pre-medical undergraduate students are a potential target population for future studies to improve medical professionalism for future doctors. Gilliland and colleagues have examined predictors for students entering medical school and their performance in medical school and internship, such as tertiary comment reviews. Further studies could expand on qualities of successful medical students looking at GPI scores as well as undergraduate medical professionalism education. These would be particularly important to emphasize for recruitment for medical school. Larger case control and longitudinal studies in the field of pre-medical professional education could better prepare future physicians.
ACKNOWLEDGEMENTS:

I would personally want to thank Dr. Copeland, Dr. Raggi-Moore, and Dr. Labrecque for their encouragement, knowledge, and compassion.
LITERATURE CITED:


APPENDIX:

Histogram of Score Differences All Students

Normal Q-Q Plot for All Students