Distribution Agreement

In presenting this thesis as a partial fulfillment of the requirements for a degree from Emory University, I hereby grant to Emory University and its agents the non-exclusive license to archive, make accessible, and display my thesis in whole or in part in all forms of media, now or hereafter now, including display on the World Wide Web. I understand that I may select some access restrictions as part of the online submission of this thesis. I retain all ownership rights to the copyright of the thesis. I also retain the right to use in future works (such as articles or books) all or part of this thesis.

Jolie Blair April 10, 2018

Examining the Trajectory of Empathy and Communication Skills of Emory University School of Medicine Medical Students

by

Jolie Blair

Douglas S. Ander, MD
Adviser

Department of Human Health

Douglas S. Ander, MD

Adviser

Jennifer Sarrett

Committee Member

Mary Lynn Owen

Committee Member

2018

Examining the Trajectory of Empathy and Communication Skills of Emory University School of Medicine Medical Students

By

Jolie Blair

Douglas S. Ander, MD

Adviser

An abstract of
a thesis submitted to the Faculty of Emory College of Arts and Sciences
of Emory University in partial fulfillment
of the requirements of the degree of
Bachelor of Arts with Honors

Department of Human Health

2018

Abstract

Examining the Trajectory of Empathy and Communication Skills of Emory University School of Medicine Medical Students

By Jolie Blair

Objective: Objective Structured Clinical Examinations (OSCEs) are used in medical education to assess learners' history-taking, physical examination, counselling, communication and empathy skills. Interactions with standardized patients (SPs) in medical schools simulates a 'real life' doctor-patient encounter. Physician empathy is critical, as it is associated with increased patient satisfaction, improved patient adherence, and enhanced quantity and quality of clinical data. Past research indicates that learners' empathy skills decline throughout medical school due to a multitude of factors including isolation and stress. The objective of this study of this study is to examine the trends in medical learners' communication and empathy skills directly assessed by SPs. Based on previous literature, we hypothesized that empathy skills would decrease overtime.

Participants and Methods: 114 learners from the Emory University Medical School Class of 2016 completed the End of Foundations (EOF) OSCE in 2013, End of Applications (EOA) OSCE in 2015, and Emergency Medicine (EM) OSCE, either in 2015 or 2016. These OSCEs correspond to years 2, 3, and 4 of the learners' medical school career. Communication and empathy items were selected from the Master Interview Rating Scale (MIRS) used in individual OSCE cases.

Results: Communication scores declined significantly throughout medical school. Empathy scores initially declined, but increased from Year 3 to Year 4, though not significantly. Male learners' communication scores were significantly lower than the females'. Male learners' empathy scores were higher than the females' though not significantly.

Conclusion: The data indicated an initial decline in empathy, yet it is unclear if empathy declines throughout medical school. Communication skills declined significantly through the three years studied. The MIRS checklist is a validated communication tool, and while it is not specifically designed to measure empathy, components of the checklist contain elements that allow for assessment of empathy skills. As patient-centered care and patient satisfaction are becoming increasingly important in the healthcare domain, physician communication and empathy play crucial roles in enhancing the doctor-patient encounter. Future research using validated tools to assess empathy will allow for better mapping of the trajectory of learners' empathy skills throughout medical school.

Examining the Trajectory of Emory University Medical Students' Empathy Skills Throughout Their Four Years

By

Jolie Blair

Douglas S. Ander, MD

Adviser

A thesis submitted to the Faculty of Emory College of Arts and Sciences
of Emory University in partial fulfillment
of the requirements of the degree of
Bachelor of Arts with Honors

Department of Human Health

2018

Acknowledgements

I would like to thank Gina Shannon and the other members of the Emory University Medical School's Clinical Skills Center for their mentorship, and for helping foster my passion for health simulations. Dr. Douglas Ander has been a wonderful adviser and has supported me throughout the entire honors process. I would like to thank Dr. Jennifer Sarrett and Mary Lynn Owen, my committee members, for their time and encouragement. I would also like to thank Dr. Amanda Freeman for answering my multitude of questions, and Donghai Liang for the many meetings and for helping with my statistical analysis.

Table of Contents

1 Introduction

1.1 An Introduction to Objective Structured Clinical Examinations (OSCEs)

First popularized in 1979, Objective Structured Clinical Examinations (OSCEs) have become widely popular in assessing learners' clinical capabilities in healthcare education (Gormley, 2011). OSCEs are defined as "'a timed examination in which medical students interact with a series of simulated patients in stations that may involve history-taking, physical examination, counselling or patient management'" (Wallace, Rao, & Haslam, 2002). The original concept of OSCEs was to create a more reliable and less biased form of clinical assessment. Learners who complete the OSCEs are assigned to the same tasks, and are graded using the same measurements. In addition to measuring knowledge base, OSCEs can also be used to assess learners' communication (Cömert et al., 2016) and empathy skills (O′Connor, King, Malone, & Guerandel, 2014).

The introduction of the use of standardized patients (SPs) to the medical school curriculum began in the early 1960s by Howard Barrows. These 'patients', who are actually actors, are standardized by training to show consistent behavior and verbal responses in an OSCE. The SPs' performances are consistent from learner to learner and from SP to SP. SPs are often trained to provide meaningful feedback in terms of objective and written reports, as well as verbal post-encounter feedback with the learner. When OSCEs employ SPs, the sequence of multiple stations with differing patients, clinical tasks and challenges are designed to resemble the 'real life' clinical environment the learners will eventually face (Adamo, 2003).

1.2 Definition(s) of Communication

Predictably, there is a vast range of definitions of communication. Four traditional explanations of communication involve interaction, encoding, a fidelity aspect, and the trading of

symbols though contradictions of the principles may result in a rejection of these four descriptions (Motley, 1990). Due to its flexibility and applicability among different disciplines, communication is defined depending on context (Rigotti & Rocci, 2006).

In today's healthcare context, patient-centered communication is key. Patient-physician communication is enhanced when physicians gain insight into their patients' values, perceptions, and needs through discussion, asking questions, and active listening (Levinson, Lesser, & Epstein, 2010). These communication skills are critical in fostering interpersonal doctor-patient relationships, informing patients, making collaborative decisions (Ha & Longnecker, 2010), and establishing patient self-management (Levinson et al., 2010).

1.3 Definition(s) of Empathy

Researchers are equally divided on a singular definition of empathy (Hojat et al., 2002). The concept of empathy is composed of behavioral, cognitive, and emotive elements, which pertain to a variety disciplines (Mercer & Reynolds, 2002; Nicolai, Demmel, & Hagen, 2007). Brown (2007) defines four attributes of empathy as being non-judgmental, being able to see the world through others' eyes, understanding other peoples' feelings, and communicating your understanding of those feelings.

In healthcare, physician empathy focuses on the cognitive element of gaining the patient's perspective and communicating the physician's understanding (Nicolai et al., 2007). Mercer and Reynolds (2002) define physician empathy as the ability to understand patients' feelings, situations and perspectives (and the associated meanings), to communicate this understanding, confirming its accuracy. Finally, based on that understanding, the physician takes collaborative action with the patient in a therapeutic and supportive manner. Though there are many

definitions of physical, or clinical, empathy, Mercer and Reynold's seems to be one of the most popular in the medical research community (e.g. Decety & Fotopoulou, 2015; Neumann et al., 2012; Sinclair et al., 2017).

Indicators of physician empathy include positive verbal interactions, longer physician-patient encounters, and nonverbal cues such as eye contact, gestures, and bodily posture (Hojat et al., 2011). Nonverbal communication can supplement, accentuate, or augments verbal communication. Nonverbal cues are ideal for expressing emotion and empathy (Griffith, Wilson, Langer, & Haist, 2003), positively affecting patient satisfaction with their clinical care (DiMatteo, Hays, & Prince, 1986).

1.4 Connection between Communication and Empathy

Though the relationship between empathy and communication is not clearly defined (Carma L. Bylund & Makoul, 2002), differences between the two are distinguishable. The physician-patient encounter, in itself, is a form of interpersonal communication (Carma L Bylund, Peterson, & Cameron, 2012). Empathy is an extension of this communication, but it must be accompanied by feeling. It is the absence, or presence, of feeling that determines whether a communicative encounter is empathetic or not (Carma et al., 2002). There are a multitude of communication challenges for physicians, but improving communication skills could help address these challenges, discover patient beliefs, and express respect for the patient. Empathy is vital in order to achieve these objectives (Winefield & Chur-Hansen, 2000).

1.5 Arguments for Physician Empathy

Empathy is essential to quality medical care (Bonvicini et al., 2009), and more medical institutions are becoming aware of the importance of physician empathy. The Association of

American Medical Colleges states that medical schools are expected to educate future physicians who are empathetic in caring for their patients (Hojat et al., 2002). The Institute of Medicine Report on Health Professionals and Training has also called on medical educators and organizations to strengthen training of communication and empathy skills in order to improve patient-centered care (Bonvicini et al., 2009).

Research indicates that physician empathy is associated with enhanced quantity and quality of clinical data, increased patient satisfaction, improved patient adherence and comprehension, and improved patient perception of the doctor-patient relationship (Bonvicini et al., 2009). Empathy has also been linked to a reduction of malpractice risk, improved moral reasoning, increased physician satisfaction, and enhanced physician attitudes, especially toward elderly patients (Hojat et al., 2002).

Additional studies demonstrate that physician empathy can lead to improved patient health (Bonvicini et al., 2009). A 2011 randomized controlled trial found that patients who perceived their physicians as empathetic had significantly decreased severity and duration of the common cold compared to the patients who received non-empathetic care (Rakel et al., 2011). A 2011 correlation study found that diabetic patients with high empathy scoring physicians were significantly more likely to have good control of their hemoglobin A1c and LDL-C compared to those with low empathy scoring physicians, indicating that empathy can be used as a predictor of optimal clinical outcomes (Hojat et al., 2011).

1.6 Arguments Against Physician Empathy

Though evidence shows that physician empathy is an important, and essential, tool for healthcare professionals, a small number of researchers argue that physician empathy is more

detrimental than beneficial. Bloom (2016) argues that empathy is “biased”, “innumerate” and “corrosive”. He reasons that although it may be helpful short term, empathy can lead to disastrous results in the future. It can push humankind to racism and narrow-mindedness while diminishing kindness and love (Bloom, 2016). Though Bloom makes abundant arguments against humans having empathy, in general, he makes no effort to support his claims with evidence.

Research has shown some negative consequences of compassion, which has been identified as ‘Compassion Fatigue’ (CF). Unlike Burnout, CF allows physicians to still care for their patients, but in a compromised way. CF is defined as the ‘cost of caring’, which is unique to professionals in helping environments. CF expresses itself suddenly as a stress response, inducing senses of isolation, confusion and helplessness (Slocum-Gori, Hemsworth, Chan, Carson, & Kazanjian, 2013). Although CF can result from caring too much, coping strategies can be employed to manage CF and reduce burnout. The consequences of CF should not be disregarded, but no direct connection between CF and physician empathy has been established.

1.7 Changes in Empathy Throughout Medical School

Past research consistently indicates a decline in empathy throughout medical school. Studies show increases in the learners’ empathy during the preclinical years (Years 1 and 2) of medical school (Chen, Lew, Hershman, & Orlander, 2007; Neumann et al., 2011). Empathy steadily decreases when clinicals begin, during the third year, as this is when the learners begin to interact with patients in a ‘real’ healthcare setting (Chen et al., 2007; Hojat et al., 2017; Neumann et al., 2011). Though this initial research suggests a decline in empathy throughout medical education, recent reexamination of the literature suggests a weak decline in mean

empathy ratings, especially due to the low response rates in these studies (Colliver, Conlee, Verhulst, & Dorsey, 2010; Ferreira-Valente et al., 2017; Roff, 2015).

1.8 Past Study Limitations

While there is an extensive amount of research on the trajectory of physician empathy throughout medical school, very few studies use SPs to measure learners' empathy skills. Most studies use self-reports of learners' perceived empathy. The studies that use patient perceptions only compare SPs' physician empathy scores to the learners' self-reported empathy ratings (e.g. Berg, Majdan, Berg, Veloski, & Hojat, 2011a, 2011b). Past studies use a variety of scales to measure empathy, but none employ the Master Interview Rating Scale (MIRS), a communication and empathy assessment measurement used in many medical schools across the nation. Finally, very few papers distinguish the relationship between physician empathy and physician communication, which could be vital in improving the patient-physician encounter.

The purpose of this study was to examine the trends in medical learners' communication and empathy skills directly assessed by SPs. Based on previous literature, we hypothesized that empathy skills would decrease overtime.

2 Methods

2.1 Participants

One hundred fourteen learners, 58 (51%) female, completed the End of Foundations (EOF) OSCE in 2013, End of Applications (EOA) OSCE in 2015, and Emergency Medicine (EM) OSCE, either in 2015 or 2016. Each of these learners completed all three measures, and the learner's performance on the OSCEs was followed longitudinally, though the data is de-identified. Original sample size was four hundred thirty-seven learners. Three hundred twenty-three learners with reported 'NA' scores for these exams were excluded from the data analysis. Self-reported gender of the learners was obtained from Emory University School of Medicine Registrar Office. No information on other learner demographics was supplied. Emory University Institutional Review Board determined that since this investigation examines the effectiveness of educational methods, no IRB review was required for this study.

2.2 Data Collection

During each of the OSCES, student cohorts had the same case while each learner completed each case in a randomized order. In each of the cases, learners had an encounter with an SP. SPs used the MIRS to rate learners' empathy and communication skills via LearningSpace (CAE, Sarasota, FL), an education management platform for medical education institutions. Items were scored using a Likert scale of 1-5 with descriptive anchors for 1, 3 and 5. MIRS is a revised version of the Arizona Clinical Interview Rating scale, and both are discriminately validated communication tools (Wagner, Pfeiffer & Harrington, 2011). An example of a MIRS item is as follows: Encouragement of Questions, where 5 = "*The Learner encouraged the patient to ask questions at the end of a major subsection and gave the patient the*

opportunity to bring up additional topics or points not covered in the interview", 3 = "*The Learner provided the patient with the opportunity to discuss any additional points or ask any additional questions, but neither encouraged nor discouraged the patient*", and 1 = "*The Learner failed to provide the patient with the opportunity to ask questions or discuss additional points. The Learner may have discouraged questions from the patient*" (*Standardized Patients*, n.d).

Emory University Medical School's Clinical Skills Center uses MIRS as a valid communication assessment tool. For each case within an OSCE, MIRS items are chosen that assess appropriate communication skills for that case. For this study, MIRS items were selected from each case assessment form that focused on specific communication and specific empathy skills. Number of communication-related and empathy-related scoring items varied by case and OSCE. (Figure 1).

2.3 Cases and Items

In an OSCE with multiple cases, the order of case progression for the learners was randomly assigned. Each case had a separate MIRS form, but the forms were composed of the same communication and empathy MIRS items.

A total of 7 cases were analyzed: 1 from EOF (Case A), 5 from EOA (Case B-F), and 1 from EM (Case G) (Figure 2). 2 to 3 items per case were selected for both communication and empathy respectively. The encounters between the learner and the SP, for the EOF OSCE, lasted 50 minutes, while the encounters for the EOA OSCE were 20 minutes, and 15 minutes for the EM OSCE. For each OSCE, the learners experienced the cases back-to back.

LearningSpace's scheduling software notified administrators when a SP was paired with a learner with whom they have had previous interactions, so it would not be possible for the SP to

encounter the same learner. SPs were trained for each case a week before the OSCE and continued to prepare for the case on their own time leading up to the event.

2.4 Measure of Communication

MIRS communication items were selected based on the Roter Interaction Analysis System (RIAS). This instrument codes statements and thoughts, made by patient or physician, into categories (Roter, Geller, Bernhardt, Larson, & Doksum, 1999) as a tool to analyze the communication between physician and patient through medical discourse (Roter & Larson, 2001). RIAS is considered a concurrent, internal valid (Price, Windish, Magaziner, & Cooper, 2008) and reliable (Sandvik et al., 2002) tool for assessing physician-patient dialogue. Independent assessment of whether a MIRS item met criteria based on RIAS was conducted. Each MIRS item used in the OSCE cases was reviewed and categorized to determine if the item met the criteria for inclusion. The criteria was determined based on the similarity between the MIRS items and the RIAS communication behaviors (Table 1). RIAS was used as a gold standard which select MIRS items met. MIRS items were chosen, as they further delineated the RIAS's criteria for questions relating to communication.

For example, MIRS Communication Item: Questioning Skills – Verification of Patient Information was selected, as it was similar to the RIAS behavior "Facilitation – Asking for Patient Opinions, Understanding or Paraphrase", which states "What do you think it is? Let me make sure I've got it right..." (Roter et al., 1997). Seven communication items were selected from MIRS, but only 4 appeared throughout the OSCEs.

2.5 Measure of Empathy

MIRS empathy items were selected based on the Jefferson Scale of Patient Perceptions of Physician Empathy (JSPPPE). JSPPPE is a 5-item instrument used to measure patients' perceptions of physician empathy (Kane, Gotto, Mangione, West, & Hojat, 2007). This scale is reported to be valid and reliable (Hojat et al., 2010), correlating significantly with the American Board of Internal Medicine patient rating scales (Kane et al., 2007). Independent assessment of whether a MIRS item met criteria based on JSPPPE was conducted. Each MIRS item used in the OSCE cases was reviewed and categorized to determine if the item met the criteria for inclusion. The criteria was determined based on the similarity between the MIRS items and the JSPPPE statements. MIRS items were determined 'empathetic' if they were similar to their JSPPPE counterparts (Table 2). MIRS items relating to empathy selected in an objective manner. JSPPPE was used to translate the MIRS items and was used to select the MIRS items associated with empathy.

For example, MIRS Empathy Item: Support Systems was deemed 'empathetic', as it correlated to the JSPPPE items that state "My doctor seems concerned about me and my family. My doctor understands my emotions, feelings, and concerns" (Hojat et al., 2010). Eight empathy items were selected from MIRS, though only 6 were available throughout the OSCEs.

2.6 Experimental Procedure

In order to maintain confidentiality, learner names were eliminated and replaced with ID numbers that were randomly assigned using a random integer generator. Communication and empathy scores from three high-stakes OSCEs were selected. One hundred fourteen learners from the MD class completed the EOF in 2013, EOA in 2015, and EM in either 2015 or 2016. Both EM exam 2015 and 2016 used the same version of the case and the same grading scale.

Cases were eliminated from analysis if they did not contain MIRS questions or if they were not completed by all the learners. Zero cases were eliminated from EOF. One case was eliminated from EOA due to lack of MIRS questions. Three cases were eliminated from EM due to incomplete scores. In total, 7 cases were chosen. All communication items were scored on a 1-5 scale. Empathy items from EOF and EOA were also scored on a 1-5 scale, but those from EM were scored on a 0-1 scale. Through multiple procedures and methods of analysis, it was determined that converting empathy scores from EOF and EOA to a 0-1 scale (where 1=0.0, 2= 0.25, 3=0.50, 4=0.75, and 5=1.0) was the most statistically sound option in order for empathy scores from all three OSCE to be consistent.

2.7 Statistical Analysis

Multi-response generalized linear mixed model (MCMCglmm) was used to assess communication scores, as this data was non-linear with mixed effects and ordinal distribution. Fit generalized linear mixed model (glmmPQL) was used to assess empathy scores due to the quasi-binomial distribution of the data. ‘R’ was the statistical software used. Statistical analyses were used to evaluate differences in items, education year and gender within communication and empathy scores. Case was not controlled for, and case differences were not analyzed, as case selection was based on the educational level of the learner.

3 Results

3.1 Communication Scores

Each of the 114 learners completed all three OSCES, and their communication and empathy scores were analyzed from each of the 7 cases. Communication scores significantly decreased over the learners' time in medical school in a step-wise fashion from year-to-year ($p<0.001$) (Table 3). The decrease in mean communication scores was significant from Year 2 to Year 3 ($p<0.01$), Year 3 to Year 4 ($p<0.01$), and Year 2 to Year 3 ($p<0.01$). Overall, there was a significant decrease in communication scores across the three years (Figure 3). Compared to Item A, Items B and C increased in communication significantly ($p<0.001$, $p<0.001$ respectively), meaning those items elicited a better response in communication from the learners.

Overall, the male learners' communication scores were significantly lower than the females' ($p<0.001$) (Table 3). Mean communication scores for female and male learners significantly differed at Year 3 ($p<0.01$) and Year 4 ($p<0.001$). There was no significant difference between male and female scores at Year 2 (Figure 4). Mean communication scores were not adjusted for case or item. Adjusted communication scores can be found in Table 3.

3.2 Empathy Scores

Empathy scores decreased over the learners' time in medical school in a step-wise fashion from year-to-year although not significantly ($p=0.3343$) (Table 4). The decrease in mean empathy scores was significant from Year 2 to Year 4 ($p<0.001$) and from Year 3 to Year 4 ($p<0.001$). There was no significant differences from Year 2 to Year 3 (Figure 6). Compared to Item A, Items C, D, E, and F resulted in less empathetic responses ($p=0.000$, $p=0.756$, $p=0.1752$

respectively). Overall, there was a decrease in empathy scores across the three years although not significant (Table 4).

Overall, male learners' scores were higher than the females', but it was not significant ($p=0.2085$) (Table 4). Differences in female and male empathy scores were significant at Year 3 ($p<0.01$), but not significant at Years 2 and 4 (Figure 5). Mean empathy scores were not adjusted for case or item. Adjusted empathy scores can be found in Table 4.

4 Discussion

The objective of this study was to examine trajectory of Emory University Medical School learners' communication and empathy skills. Using MIRS items completed by the SPs, learners' communication and empathy scores were collected at three pivotal points in medical school. Based on previous literature, we predicted that both communication and empathy skills would decline over the learners' time in medical school. We also hypothesized that females would exhibit better communication and stronger empathy skills.

Overall, we found that communication skills declined significantly throughout medical school. Learners' empathy skills decreased between Year 2 and Year 3, and increased from Year 3 to Year 4, though not significantly. While male communication scores were significantly lower than the females', male empathy scores were higher, though not significantly.

Past research suggests that empathy declines throughout medical school, especially during the learners' clinical years (e.g. (Berg, Majdan, Berg, Veloski, & Hojat, 2011a, 2011b). Recent reviews of the literature, however, suggests that no clear conclusions can be made in regards to changes in empathy throughout medical school. While most longitudinal studies reported a decline in empathy, most cross-sectional studies reported higher or similar empathy scores across the four years (Ferreira-Valente et al., 2017). Our findings are not consistent with past literature, nor do they support our hypothesis, as the trend in empathy skills through Years 2, 3 and 4 is inconsistent.

Contrary to our findings, past literature consistently reports that female learners score higher in empathy than their male counterparts (Berg et al., 2011b; O′Connor, King, Malone, &

Guerandel, 2014). Female physicians are more likely to use positive talk, positive nonverbal communication, and tend to spend longer with their patients compared to male physicians. While research suggests that female learners and physicians may be more empathetic, gender differences should not be the only focus when looking at physician communication and empathy (Bylund & Makoul, 2002). Patients' expectations of physician communication may differ based on the physician's gender. Patients with female physicians tend to volunteer more psychosocial and biomedical information than those with male physicians. Patients of female physicians usually play a greater role in building a doctor-patient bond and use more positive language; female physicians tend to facilitate relationships with their patients and use positive talk (Hall & Roter, 2002). Therefore, it could be that the SP's perception of how a male or female physician 'should' act influenced the way they scored the learners' empathy skills. Because females are inherently seen as empathetic, the male learners could have received higher empathy scores because they showed more empathy than the average male.

The changes in learners' communication and empathy skills usually occur during the third year of medical school called 'clinicals'. This is when the learners engage in clinical training, learn how to take histories, and perform medical examinations of real patience. The learners rotate through different departments such as pediatrics, emergency medicine, psychiatry, gynecology, and internal medicine (Hojat et al., 2017). Changes in communication and empathy skills may be due to hurried and fragmented doctor-physician encounters, and brief social relationships. Sadness, prolonged experiences of prolonged tragedies, chronic lack of sleep, long hours on the job, and depression are factors that can influence these changes (Spencer, 2004). Chronic stress from working with patients, other physicians, and healthcare institutions can also contribute to these changes in the clinical years of medical school (Adams, 2004).

4.1 Limitations

The study's limitations include analyzing scores from one medical school class at only three critical points, and not consistently over the four years. Also, the lack of consistency in the data made it difficult to get reliable, longitudinal results. For example, the scoring of the empathy MIRS had to be converted from a 1-5 scale to a 0-1 scale in order for all three OSCEs to be statistically analyzed. There were multiple methods of executing this conversion; while the technique used in this study was chosen as the best choice possible, other methods could result in different results. Some assumptions were made converting the MIRS items to another scale. These speculations have not been tested or validated by other reviewers. Selecting both communication and empathy MIRS items by myself, from the RIAS and JSPPPE, and without a third party, is also a limitation.

Each OSCEs had a varying amount of cases and was not consistent throughout the three examinations. Due to the lack of consistent data, many learners were excluded from this study, multiple medical school classes could not be analyzed at once, and analysis of data from medical school to residency was not possible. While MIRS is a validated communication tool, it has not been validated as an empathy tool. The study utilized some MIRS items as surrogates for empathy, but other studies used specific checklist items for measuring empathy.

4.2 Future Research

It is suggested that future research focuses on MIRS and scoring from standardized patients to measure physician communication and empathy. A more consistent and reliable definition of physician empathy is needed in order for empathy skills to be measured throughout medical school and beyond. Moving forward, medical education institutions might consider creating congruency throughout their OSCEs from cases to items to grading, so more valid

research and analysis can be done on these measures of learner competency. Future studies can use medical education tools, such as MIRS and SPs, to measure changes of communication and empathy from medical school to residency, and into the 'real' world.

5 Conclusion

The present summary aimed to examine the trends in communication and empathy skills through Years 2, 3, and 4 of medical school. We hypothesized, based on past literature, that empathy scores would decrease throughout the three OSCEs: EOF, EOA, and EM. The study indicates that communication skills decline throughout medical school. Although the empathy skills data did not demonstrate a significant decline, there was a trend towards decreased empathy. Differentiating between empathy and communication skills can be difficult, as they are intertwined in patient care. As a result, a change in communication could result in a change in empathy and vice versa. Medical schools could also provide specific courses that target medical learners' communication and empathy skills in order to enhance these critical tools. As patient-centered care, and patient satisfaction, is becoming increasingly important in today's healthcare world, doctor-patient encounters, physician communication, and physician empathy are becoming critical skills for physicians.

Communication, and potentially empathy, decline through the course of a learner's time in medical school. These declines need to be addressed if we are to graduate physicians with the necessary skill set for future medical practice.

6 Appendix 1: Tables

Table 1. Comparison of Master Interview Rating Scale (MIRS) Communication Items and Roter Interaction Analysis System (RIAS) Communication Behaviors.

MIRS Communication Items (*Standardized Patients*, n.d)	RIAS Communication Behaviors (Roter et al., 1997)
<u>(A) Questioning Skills – Types of Questions</u> Example: • Open-ended: *"Tell me about the pain. Tell me what makes the pain feel worse?"* • Direct: *"Is it a deep pain? Does the pain seem to travel around?"*	<u>Data Gathering</u> Example: • Open-ended: *"How have you responded to medication? What's happening with your son?"* • Close-ended: *"Did the shot help? Are you sleeping any better?"*
<u>(B) Questioning Skills – Verification of Patient Information</u> Example: • *"Can you explain what you mean by 'weak'? You said you were allergic to penicillin. How do you know that?"*	<u>Facilitation - Asking for Patient Opinion, Understanding or Paraphrase</u> Example: • *"What do you think it is? Let me make sure I've got it right-you said the pain is less than before, but still bad"*

(C) Lack of Jargon Note: • "One of the skills of an interviewer is the ability to communicate with the patient. It is necessary to substitute jargon or difficult medical terms with terms know to lay persons"	Biomedical information - Medical Condition, Therapeutic Regimen Example: • *"The medication may make you drowsy. You'll need to take the antibiotics every day for 10 days"*
(D) Encouragement of Questions Example: • *"If you have any questions at any time, feel free to ask. Before we move on, do you have any questions?"*	Facilitation - Asking for Patient Opinion, Understanding or Paraphrase Example: • *"What do you think it is? Do you follow?"*

Table 2. Comparison of Master Interview Rating Scale (MIRS) Empathy Items and Jefferson Scale of Patient's Perception of Physician Empathy (JSPPPE) Items.

MIRS Empathy Items (*Standardized Patients*, n.d)	JSPPPE Items (Hojat et al., 2010)
<u>(A) Eliciting the Narrative Thread or the Patient's Story</u> Note: • "The interviewer should encourage the patient to talk about his or her problem(s), in her or his own words. The interviewer listens attentively without interrupting"	<u>Concern</u> Example: • *"My doctor seems concerned about me and my family. My doctor asks about what is happening in my daily life"*
<u>(B) Patent's Perspective (Beliefs)</u> Note: • "It is very important for the interviewer to elicit the patient's perspective on his illness in order for it to be effectively diagnosed and treated	<u>Understanding</u> Example: • *"My doctor is an understanding doctor. My doctor asks about what is happening in my daily life"*

(C) Support Systems Example: • "*Is there anyone that you think can help you with the children until you're feeling better?"*	Caring Example: • *"My doctor seems concerned about me and my family. My doctor understands my emotions, feelings and concerns"*
(D) Verbal Facilitation Skills and Encouragement Example: • *I'm glad you're doing a breast self-exam every month... 'I see,' 'Go on,' 'Uh-huh,' 'Tell me more'"*	Understanding Example: • *"My doctor is an understanding doctor. My doctor understands my emotions, feelings and concerns. My doctor can view things from my perspective"*
(E) Non- Verbal Facilitation Skills Notes: • "The interviewer demonstrates appropriate non-verbal behavior, such as: eye contact, body language, facial expressions, reduction of physical barriers, physical contact"	Understanding Example: • *"My doctor is an understanding doctor. My doctor understands my emotions, feelings and concerns"*

(D) Empathy and Acknowledging Patient Cutes	Understanding
Example: • *"That must have been very difficult for you. I'll be working with you each step of the way"*	Example: • *"My doctor is an understanding doctor. My doctor understands my emotions, feelings and concerns. My doctor can view things from my perspective"*

Table 3. Communication Scores Data

	Mean of Posterior Distribution	95% CI	p
ITEM B	1.025	(0.48321, 1.60371)	<0.001
ITEM C	0.544	(0.26696, 0.85713)	<0.001
ITEM D	0.234	(-0.03168, 0.50043)	0.082
EDYEAR 3	-0.42386	(-0.69752, -0.13842)	<0.001
EDYEAR 4	-0.85878	(-1.39602, -0.29198)	<0.001
Male	-0.30726	(-0.50776, -0.09404)	<0.001

Note. CI = Confidence Interval; p = P-Value; ITEM = MIRS Item; EDYEAR = Education Year.

Table 4. Empathy Scores Data

	Beta Coefficient	95% CI	p
ITEM B	0.8019882	(1.217687, 0.2862899)	0.0002
ITEM C	-2.7700011	(-2.225915, -3.314087)	0.0000
ITEM D	-0.1620742	(0.01662429, -0.3407727)	0.0756
ITEM E	-0.0465973	(0.1278482, -0.2210428)	0.6006
ITEM F	-0.1659509	(0.073901, -0.4058028)	0.1752
EDYEAR 3	-0.0823299	(0.08476923, -0.249429)	0.3343
EDYEAR 4	1.1608884	(1.652838, 0.6689386)	0.0000
Male	0.1473729	(0.3757119, -0.08096608)	0.2085

Note. CI = Confidence Interval; p = P-Value; ITEM = MIRS Item; EDYEAR = Education Year.

7 Appendix 2: Figures

Figure 1. Communication and Empathy MIRS Items for Each OSCE Case.

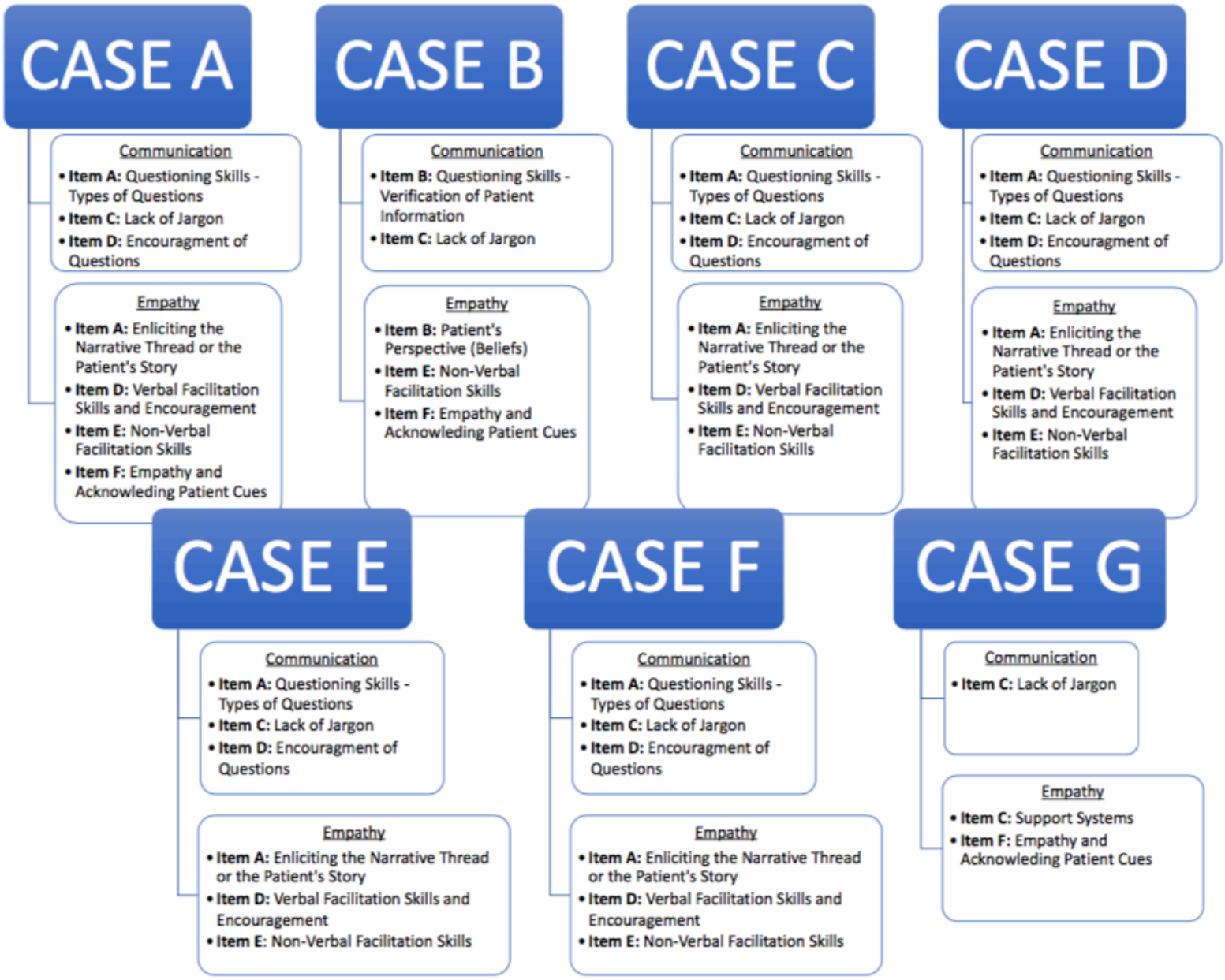


Figure 2. Overview of Cases and Case Descriptions for each OSCE. Each case has a communication component.

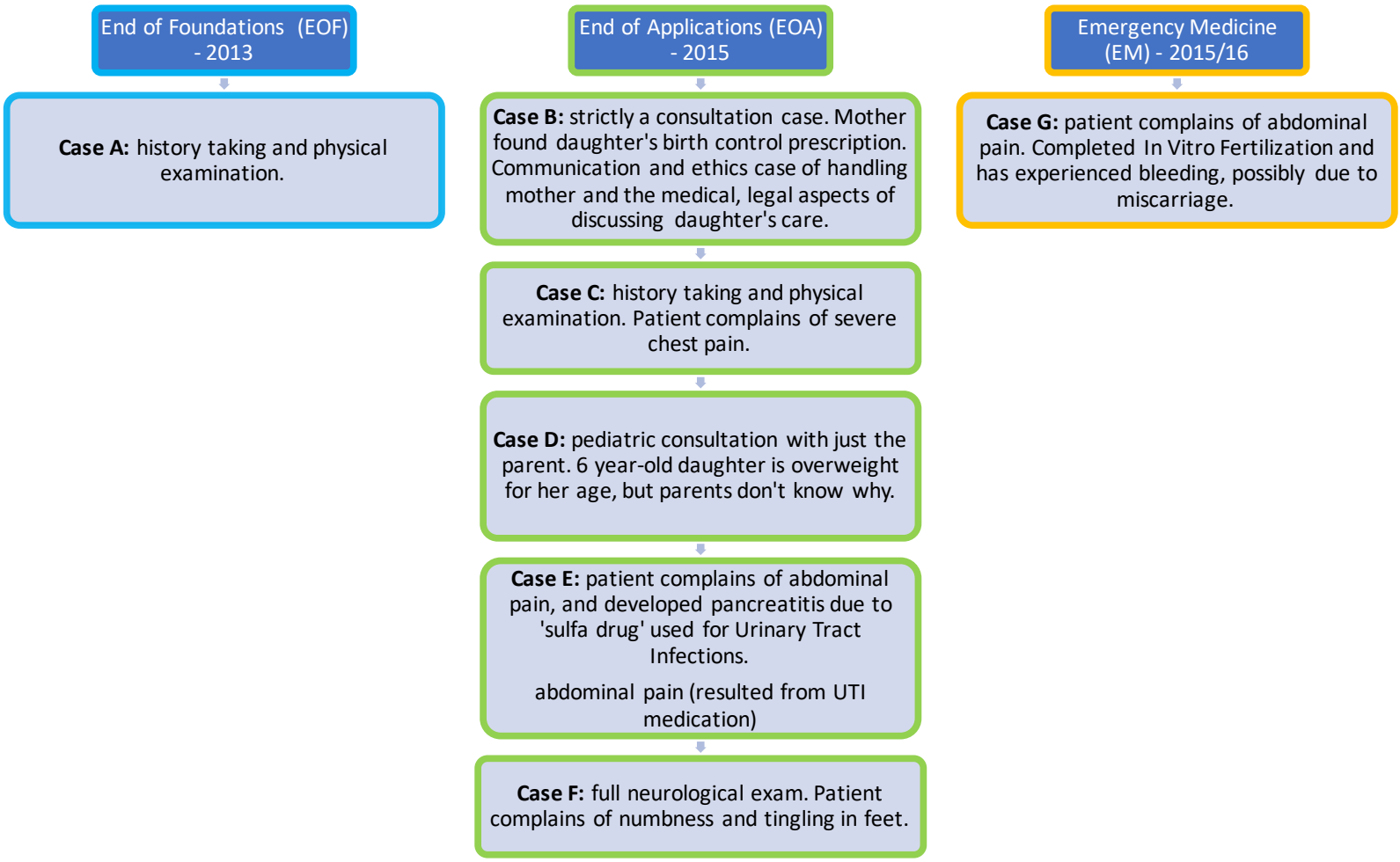
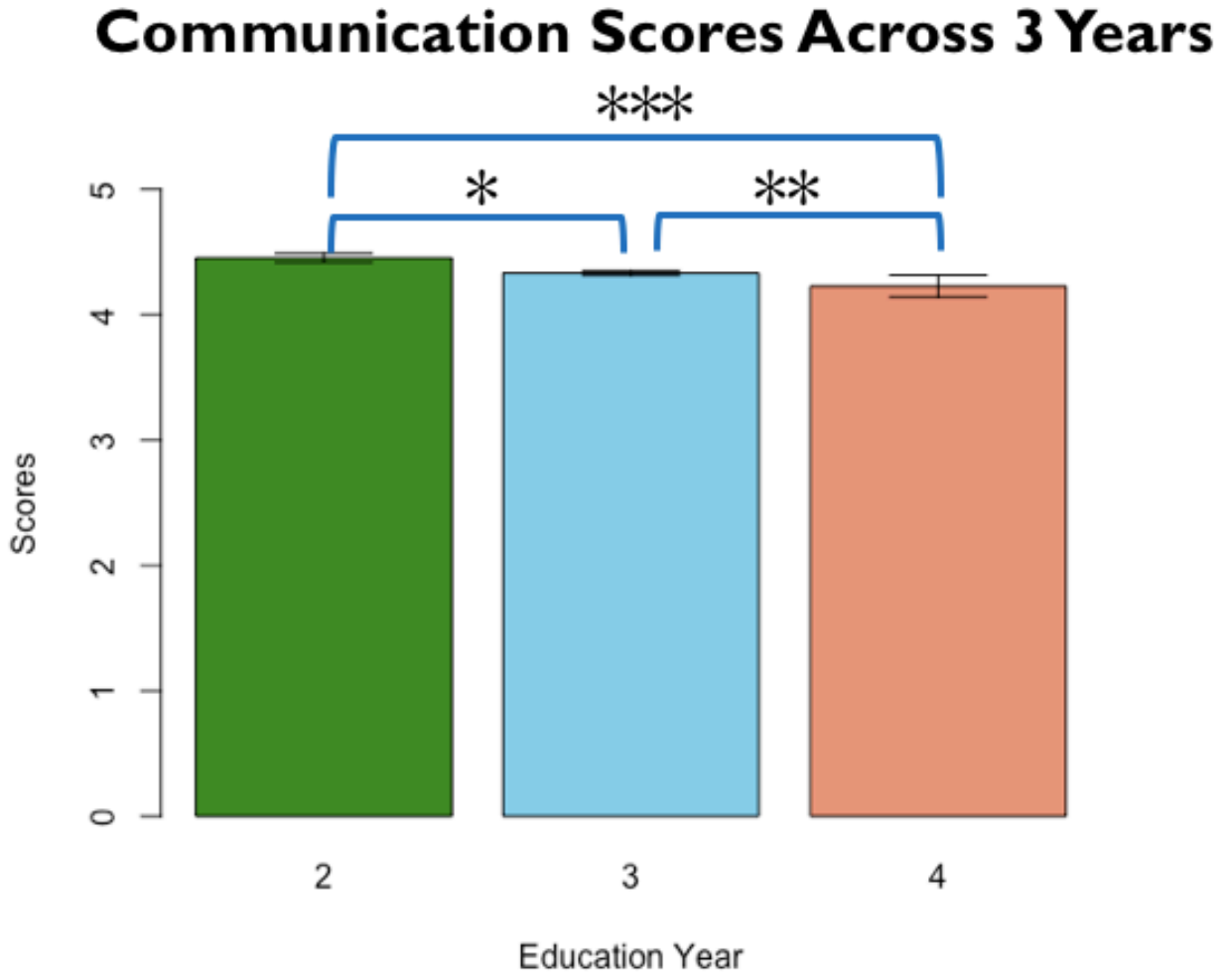
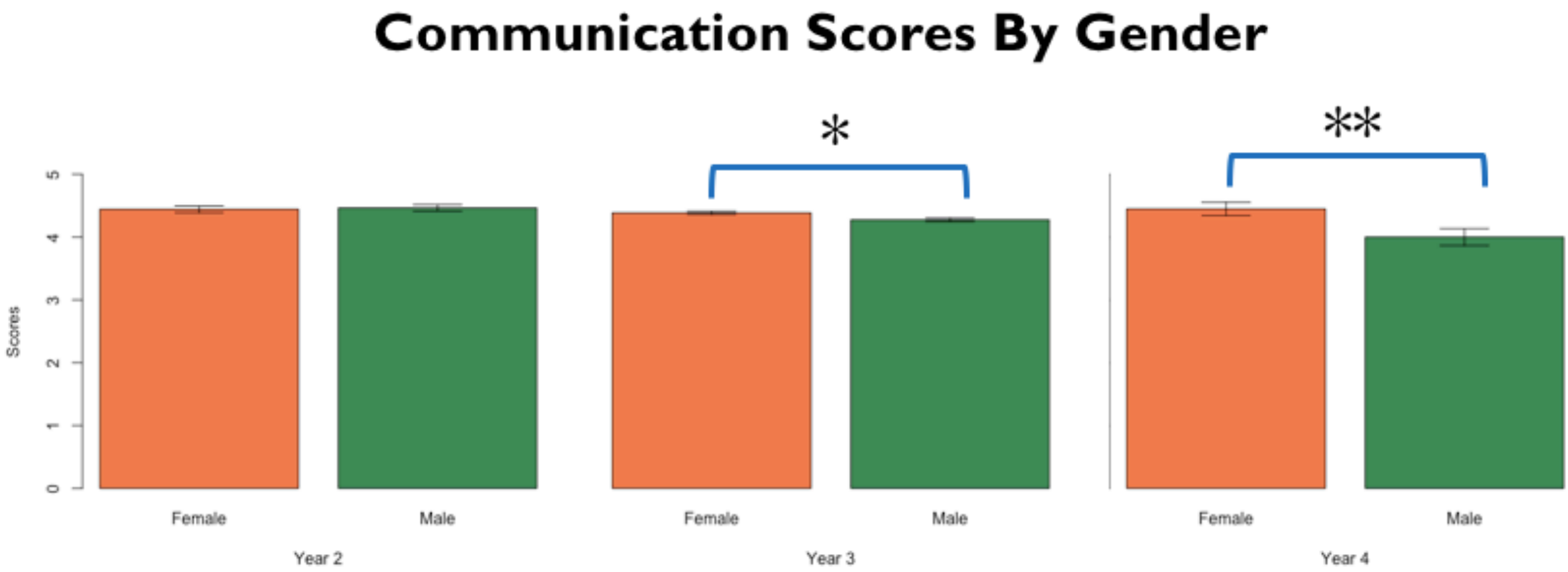


Figure 3. Comparison of Mean Communication Scores from EOF (Year 2), EOA (Year 3) and EM (Year 4) OSCEs. The decrease in mean communication scores was significant from Year 2 to Year 3 ($p<0.01$), Year 3 to Year 4 ($p<0.01$), and Year 2 to Year 3 ($p<0.01$). Overall, there was a significant decrease in communication scores across the three years.



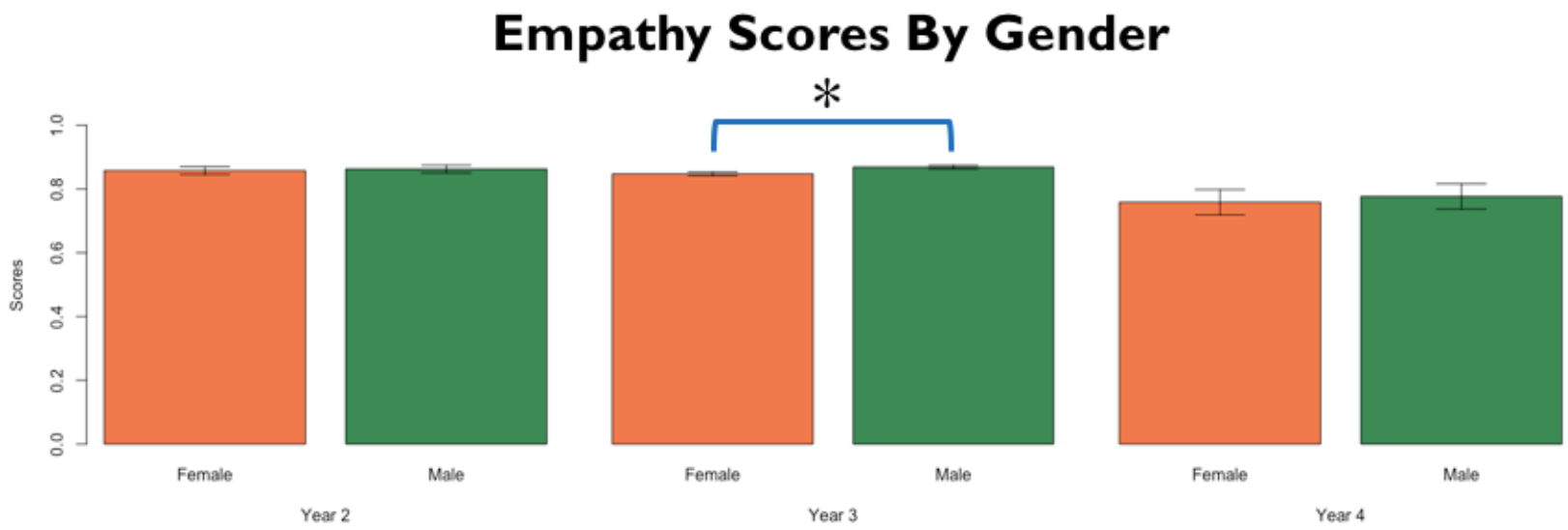
Note. * = $p<0.01$; **= $p<0.01$; *** = $p<0.01$; OSCE = Objective Structured Clinical Examination; EOF = End of Foundations; EOA = End of Applications; EM = Emergency Medicine.

Figure 4. Comparison of Mean Male and Female Communication Scores from EOF (Year 2), EOA (Year 3) and EM (Year 4) OSCEs. Mean communication scores for female and male learners significantly differed at Year 3 ($p<0.01$) and Year 4 ($p<0.001$). There was no significant difference between male and female communication scores at Year 2.



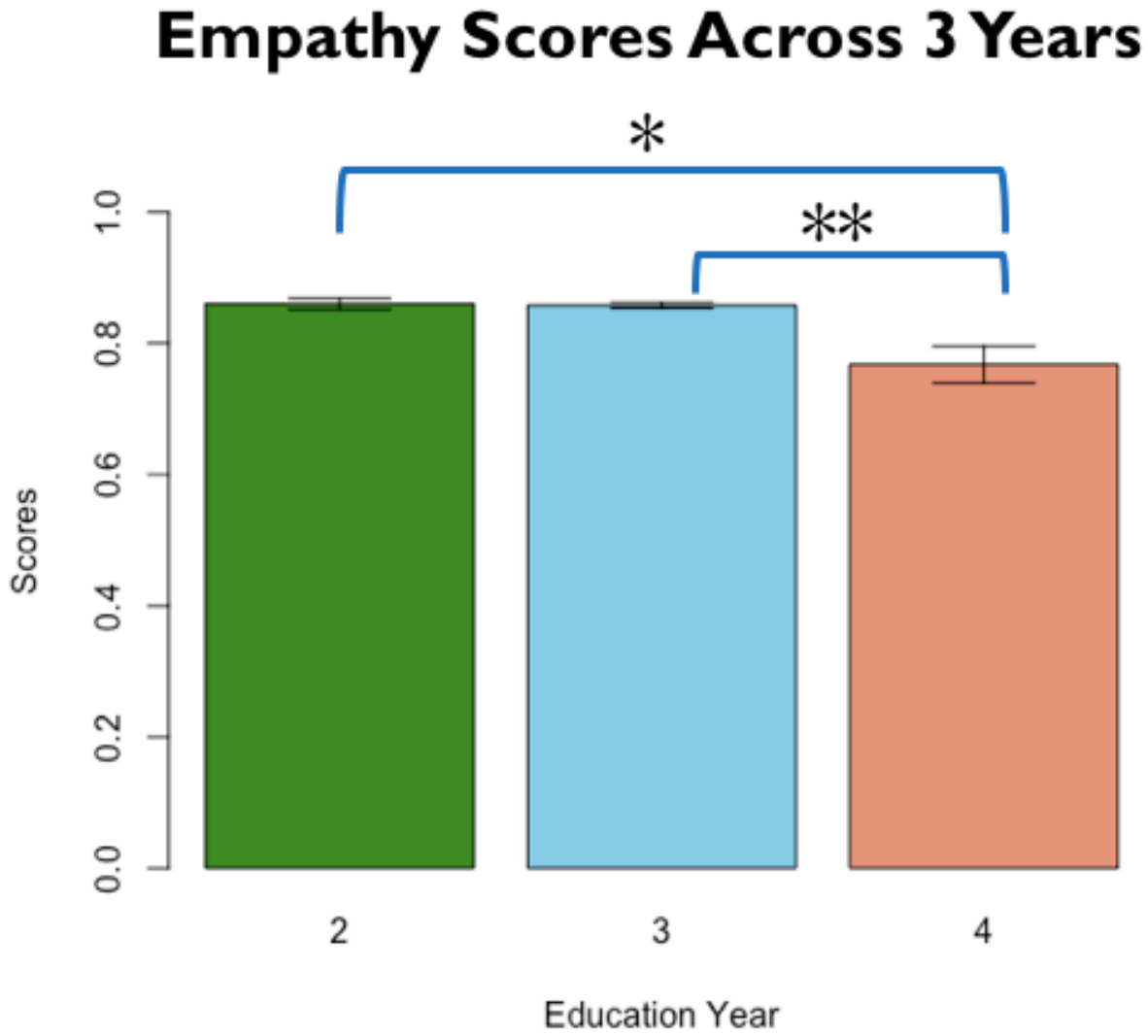
Note. * = $p<0.01$; **= $p<0.001$; OSCE = Objective Structured Clinical Examination; EOF = End of Foundations; EOA = End of Applications; EM = Emergency Medicine.

Figure 5. Comparison of Mean Male and Female Empathy Scores from EOF (Year 2), EOA (Year 3) and EM (Year 4) OSCEs. Differences in female and male empathy scores were significant at Year 3 ($p<0.01$), but not significant at Years 2 and 4.



Note. * = $p<0.01$; OSCE = Objective Structured Clinical Examination; EOF = End of Foundations; EOA = End of Applications; EM = Emergency Medicine.

Figure 6. Comparison of Mean Empathy Scores from EOF (Year 2), EOA (Year 3) and EM (Year 4) OSCEs. The decrease in mean empathy scores was significant from Year 2 to Year 4 ($p<0.001$) and from Year 3 to Year 4 ($p<0.001$). There was no significant difference in empathy scores from Year 2 to Year 3.



Note. * = p>0.001; ** = p>0.001; OSCE = Objective Structured Clinical Examination; EOF = End of Foundations; EOA = End of Applications; EM = Emergency Medicine.

8 References

Adamo, G. (2003). Simulated and standardized patients in OSCEs: achievements and challenges 1992-2003. *Medical Teacher, 25*(3), 262-270. doi:10.1080/0142159031000100300

Adams, J. (2004). Straining to describe and tackle stress in medical students. *Medical Education, 38*(5), 463-464. doi:10.1111/j.1365-2929.2004.01810.x

Berg, K., Majdan, J. F., Berg, D., Veloski, J., & Hojat, M. (2011a). A comparison of medical students' self-reported empathy with simulated patients' assessments of the students' empathy. *Medical Teacher, 33*(5), 388-391. doi:10.3109/0142159X.2010.530319

Berg, K., Majdan, J. F., Berg, D., Veloski, J., & Hojat, M. (2011b). Medical Students' Self-Reported Empathy and Simulated Patients' Assessments of Student Empathy: An Analysis by Gender and Ethnicity. *Academic Medicine, 86*(8), 984-988. doi:10.1097/ACM.0b013e3182224f1f

Bloom, P. (2016). *Against Empathy*. New York, NY: HarperCollins.

Bonvicini, K. A., Perlin, M. J., Bylund, C. L., Carroll, G., Rouse, R. A., & Goldstein, M. G. (2009). Impact of communication training on physician expression of empathy in patient encounters. *Patient Education and Counseling, 75*(1), 3-10. doi:https://doi.org/10.1016/j.pec.2008.09.007

Brown, B. (2007). *I Thought It Was Just Me (But It Isn't)*. New York, NY: Penguin Random House.

Bylund, C. L., & Makoul, G. (2002). Empathic communication and gender in the physician–patient encounter. *Patient Education and Counseling, 48*(3), 207-216. doi:https://doi.org/10.1016/S0738-3991(02)00173-8

Bylund, C. L., Peterson, E. B., & Cameron, K. A. (2012). A practitioner's guide to interpersonal communication theory: An overview and exploration of selected theories. *Patient Education and Counseling, 87*(3), 261-267.

Chen, D., Lew, R., Hershman, W., & Orlander, J. (2007). A Cross-sectional Measurement of Medical Student Empathy. *Journal of General Internal Medicine, 22*(10), 1434-1438. doi:10.1007/s11606-007-0298-x

Colliver, J. A., Conlee, M. J., Verhulst, S. J., & Dorsey, J. K. (2010). Reports of the Decline of Empathy During Medical Education Are Greatly Exaggerated: A Reexamination of the Research. *Academic Medicine, 85*(4), 588-593. doi:10.1097/ACM.0b013e3181d281dc

Cömert, M., Zill, J. M., Christalle, E., Dirmaier, J., Härter, M., & Scholl, I. (2016). Assessing Communication Skills of Medical Students in Objective Structured Clinical Examinations (OSCE) - A Systematic Review of Rating Scales. *PLOS ONE, 11*(3), e0152717. doi:10.1371/journal.pone.0152717

Decety, J., & Fotopoulou, A. (2015). Why empathy has a beneficial impact on others in medicine: unifying theories. *Frontiers in Behavioral Neuroscience, 8*(457). doi:10.3389/fnbeh.2014.00457

DiMatteo, M. R., Hays, R. D., & Prince, L. M. (1986). Relationship of physicians' nonverbal communication skill to patient satisfaction, appointment noncompliance, and physician workload. *Health Psychology, 5*(6), 581-594.

Ferreira-Valente, A., Monteiro, J. S., Barbosa, R. M., Salgueira, A., Costa, P., & Costa, M. J. (2017). Clarifying changes in student empathy throughout medical school: a scoping review. *Advances in Health Sciences Education, 22*(5), 1293-1313. doi:10.1007/s10459-016-9704-7

Gormley, G. (2011). Summative OSCEs in undergraduate medical education. *The Ulster Medical Journal, 80*(3), 127-132.

Griffith, C. H., Wilson, J. F., Langer, S., & Haist, S. A. (2003). House Staff Nonverbal Communication Skills and Standardized Patient Satisfaction. *Journal of General Internal Medicine, 18*(3), 170-174. doi:10.1046/j.1525-1497.2003.10506.x

Ha, J. F., & Longnecker, N. (2010). Doctor-patient communication: a review. *The Ochsner Journal, 10*(1), 38-43.

Hall, J. A., & Roter, D. L. (2002). Do patients talk differently to male and female physicians? *Patient Education and Counseling, 48*(3), 217-224. doi:10.1016/S0738-3991(02)00174-X

Hojat, M., Gonnella, J. S., Nasca, T. J., Mangione, S., Vergare, M., & Magee, M. (2002). Physician Empathy: Definition, Components, Measurement, and Relationship to Gender and Specialty. *American Journal of Psychiatry, 159*(9), 1563-1569. doi:10.1176/appi.ajp.159.9.1563

Hojat, M., Louis, D. Z., Maxwell, K., Markham, F., Wender, R., & Gonnella, J. S. (2010). Patient perceptions of physician empathy, satisfaction with physician, interpersonal trust, and compliance. *International Journal of Medical Education, 1*, 83-87. doi:10.5116/ijme.4d00.b701

Hojat, M., Louis, D. Z., Markham, F. W., Wender, R., Rabinowitz, C., & Gonnella, J. S. (2011). Physicians' Empathy and Clinical Outcomes for Diabetic Patients. *Academic Medicine, 86*(3), 359-364. doi:10.1097/ACM.0b013e3182086fe1

Hojat, M., Mangione, S., Nasca, T. J., Rattner, S., Erdmann, J. B., Gonnella, J. S., & Magee, M. (2017). An empirical study of decline in empathy in medical school. *Medical Education, 38*(9), 934-941. doi:10.1111/j.1365-2929.2004.01911.x

Kane, G. C., Gotto, J. L., Mangione, S., West, S., & Hojat, M. (2007). Jefferson Scale of Patient's Perceptions of Physician Empathy: Preliminary Psychometric Data. *Croatian Medical Journal, 48*(1), 81-86.

Levinson, W., Lesser, C. S., & Epstein , R. M. (2010). Developing Physician Communication Skills For Patient-Centered Care. *Health Affairs, 29*(7), 1310-1318. doi:10.1377/hlthaff.2009.0450

Mercer, S. W., & Reynolds, W. J. (2002). Empathy and quality of care. *British Journal of General Practice, 52*(Suppl), S9-12.

Motley, M. T. (1990). On whether one can(not) not communicate: An examination via traditional communication postulates. *Western Journal of Speech Communication, 54*(1), 1-20. doi:10.1080/10570319009374322

National Joint Committee for the Communication Needs of Persons With Severe Disabilities. (1992). *Guidelines for meeting the communication needs of persons with severe disabilities*. Retrieved from www.asha.org/policy

Neumann, M., Edelhäuser, F., Tauschel, D., Fischer, M. R., Wirtz, M., Woopen, C., . . . Scheffer, C. (2011). Empathy Decline and Its Reasons: A Systematic Review of Studies With Medical Students and Residents. *Academic Medicine, 86*(8), 996-1009. doi:10.1097/ACM.0b013e318221e615

Neumann, M., Scheffer, C., Tauschel, D., Lutz, G., Wirtz, M., & Edelhäuser, F. (2012). Physician empathy: Definition, outcome-relevance and its measurement in patient care and medical education. *GMS Zeitschrift für Medizinische Ausbildung, 29*(1), Doc11. doi:10.3205/zma000781

Nicolai, J., Demmel, R., & Hagen, J. (2007). Rating Scales for the Assessment of Empathic Communication in Medical Interviews (REM): Scale Development, Reliability, and Validity. *Journal of Clinical Psychology in Medical Settings, 14*(4), 367-375. doi:10.1007/s10880-007-9081-8

O′Connor, K., King, R., Malone, K. M., & Guerandel, A. (2014). Clinical Examiners, Simulated Patients, and Student Self-assessed Empathy in Medical Students During a Psychiatry Objective Structured Clinical Examination. *Academic Psychiatry, 38*(4), 451-457. doi:10.1007/s40596-014-0133-8

Price, E. G., Windish, D. M., Magaziner, J., & Cooper, L. A. (2008). Assessing validity of standardized patient ratings of medical students' communication behavior using the Roter interaction analysis system. *Patient Education and Counseling, 70*(1), 3-9. doi:https://doi.org/10.1016/j.pec.2007.10.002

Rakel, D., Barrett, B., Zhang, Z., Hoeft, T., Chewning, B., Marchand, L., & Scheder, J. (2011). Perception of Empathy in the Therapeutic Encounter: Effects on the Common Cold. *Patient Education and Counseling, 85*(3), 390-397. doi:https://doi.org/10.1016/j.pec.2011.01.009

Rigotti, E., & Rocci, A. (2006). Towards a definition of communication context. Foundations of an interdisciplinary approach to communication. *Studies in Communication Sciences, 6*(2).

Roff, S. (2015). Reconsidering the "decline" of medical student empathy as reported in studies using the Jefferson Scale of Physician Empathy-Student version (JSPE-S). *Medical Teacher, 37*(8), 783-786. doi:10.3109/0142159X.2015.1009022

Roter, D. L., Geller, G., Bernhardt, B. A., Larson, S. M., & Doksum, T. (1999). Effects of obstetrician gender on communication and patient satisfaction. *Obstetrics & Gynecology, 93*(5, Part 1), 635-641. doi:https://doi.org/10.1016/S0029-7844(98)00542-0

Roter, D. L., & Larson, S. (2001). The Relationship Between Residents' and Attending Physicians' Communication During Primary Care Visits: An Illustrative Use of the Roter Interaction Analysis System. *Health Communication, 13*(1), 33-48. doi:10.1207/S15327027HC1301_04

Roter, D. L., Stewart, M., Putnam, S. M., Lipkin, M., Jr., Stiles, W., & Inui, T. S. (1997). Communication patterns of primary care physicians. *Journal of the American Medical Association, 277*(4), 350-356.

Sandvik, M., Eide, H., Lind, M., Graugaard, P. K., Torper, J., & Finset, A. (2002). Analyzing medical dialogues: strength and weakness of Roter's interaction analysis system (RIAS). *Patient Education and Counseling, 46*(4), 235-241. doi:10.1016/S0738-3991(02)00014-9

Shapiro, S. L., Schwartz, G. E., & Bonner, G. (1998). Effects of Mindfulness-Based Stress Reduction on Medical and Premedical Students. *Journal of Behavioral Medicine, 21*(6), 581-599. doi:10.1023/a:1018700829825

Shochet, R., King, J., Levine, R., Clever, S., & Wright, S. (2013). 'Thinking on my feet': an improvisation course to enhance students' confidence and responsiveness in the medical interview. *Education for Primary Care, 24*(2), 119-124. doi:10.1080/14739879.2013.11493466

Sinclair, S., Beamer, K., Hack, T. F., McClement, S., Bouchal, S. R., Chochinov, H. M., & Hagen, N. A. (2017). Sympathy, empathy, and compassion: A grounded theory study of

palliative care patients' understandings, experiences, and preferences. *Palliative Medicine, 31*(5), 437-447. doi:10.1177/0269216316663499

Slocum-Gori, S., Hemsworth, D., Chan, W. W., Carson, A., & Kazanjian, A. (2013). Understanding Compassion Satisfaction, Compassion Fatigue and Burnout: A survey of the hospice palliative care workforce. *Palliative Medicine, 27*(2), 172-178. doi:10.1177/0269216311431311

Standardized Patients. (n.d.). Retrieved from https://med.emory.edu/excel/centers/clinical-skills-center/standardized-patients.html

Wagner, J. A., Pfeiffer, C. A., & Harrington, K. L. (2011). Evaluation of Online Instruction to Improve Medical and Dental Students' Communication and Counseling Skills. *Evaluation & the Health Professions, 34*(3), 383-397. doi:10.1177/0163278710380612

Wallace, J., Rao, R., & Haslam, R. (2002). Simulated patients and objective structured clinical examinations: review of their use in medical education. *Advances in Psychiatric Treatment, 8*(5), 342-348.

Winefield, H. R., & Chur-Hansen, A. (2000). Evaluating the outcome of communication skill teaching for entry-level medical students: does knowledge of empathy increase? *Medical Education, 34*(2), 90-94. doi:10.1046/j.1365-2923.2000.00463.x