UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL CENTER

Erosion of Empathy in Medical Trainees

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Purpose

Patient care is a complex endeavor that involves largely the application of medical knowledge and communication skills. Medical literature has reported that the patient-physician relationship and the ability to communicate empathy have many benefits for health outcomes, physician well-being, and the community. Unfortunately, studies show that although reported empathy increases during the pre-clinical years, once a student enters the apprentice phase, those scores start to trend downward and continue to decrease during residency. Many hypotheses exist on why this attrition occurs and thereby provide a good starting point to create interventions. Our calling as medical educators is to foster an environment that teaches patient-centered care and arm our students with the ability to not only remain compassionate but ideally, increase their ability to respond empathetically.

Objectives

Define empathy.

Discuss potential benefits and risks of empathy in medicine.

Discover biological, personality and professional factors that influence empathy.

Understand how empathy evolves during the education of a physician.

Summarize literature on interventions aimed at cultivating empathy.

Biographical Sketch

Reeni Abraham trained at Texas Tech University for medical school. She then completed her Internal Medicine Residency training at Albert Einstein Montefiore in the Bronx. She stayed on faculty for two years as an Academic Hospitalist in the Jack D. Weiler Hospitalist Division. Travelling across the world, she worked in New Zealand for six months as an internist specialist at the Gisborne Tairawhiti Hospital, which serves the largest population of indigenous Maori in the country. Returning to her home state of Texas, she began working at UT Southwestern in 2009. She currently works for the Clements Hospital and Parkland Hospital Hospitalists groups and in Palliative Care Medicine. Her passions are medical education and specifically empathy in medicine and patient-physician communication.

Erosion of Empathy Protocol

Introduction

Over the last century, the landscape of medical practice has drastically changed. Medical technology has revolutionized the patient-physician relationship and the medical workplace. Previous CT scans can be reviewed at the patient's bedside; electronic health records can provide reminders for important health maintenance and caution when pharmacotherapies are ordered not in line with standard of care. There has been a growing emphasis on quality of care as well as increasing expectations of physician productivity. However as early as 1927, Peabody warned that rapidly growing scientific technology was drowning out the human perspective in the management of patients,[4] and in 2011 during a TEDtalk in Scotland, Dr. Abraham Verghese declared the greatest advance in medical technology in the 21st century would be the human hand.[5] No matter the technological advances, the medical community seems to always circle back to the heart of medicine, the patient-physician connection. For patients, an important component of connectedness with their physicians is their perception of their doctor's empathy.

Definition and Models of Empathy

Scientists have been fascinated with the concept of empathy and its clinical context for centuries, but given its complexity, many definitions and multi-dimensional models exist.[6] The plebian definition refers to the ability of an individual to feel what another person is experiencing – "walking in another's shoes" if you will.

Although most scholars would agree that there is no one definition that encompasses all of the nuances of empathy, the most basic description involves an understanding of a patient's perspective and communicating one's understanding.[7] It is argued that empathy is distinctly different from sympathy which is a sharing of emotions,[8] while others state sympathy is an aspect of empathy.[9]

Reviewing the medical literature, Morse[6] focused on the practitioner and found 4 basic components of empathy: emotive, a parallel to the definition of sympathy, is defined as imagining what another is feeling; the moral component is the motivating source behind empathy. Cognitive is the intellectual ability to identify with and understand patients. And finally, there is the communicating of one's feeling and understanding which is called the behavioral component.

Although Morse's model is helpful to breakdown empathy into observable competencies, it neglects to integrate the patients' experience. To this end, Barret-Lennard developed the "empathy cycle" with three phases. With reference to patients, phase 1 is cognitively understanding another's expression of their experience through attentive listening. Phase 2 involves communicating that understanding; while phase 3 is the patient's perception of the communication.

Mercer and Reynolds take it one step further and argue to be successful empathy must form a therapeutic alliance that ends in the process of shared decision making.

Many factors play a synergistic role in the patient-physician relationship to produce health outcomes. Not only does empathetic care through cognitive, emotional and behavioral measures along with physical care effect how a patient responds, but the patient's response due to previous experiences, cultural and spiritual beliefs, and their own emotional regulation effect how a physician provides this care (See Figure 1).[10]

Emotional attunement is debatable as a necessary component of empathy. Some say empathy is not sincere without it whereas others feel it is only the theatrical show needed not the actual emotional contagion.

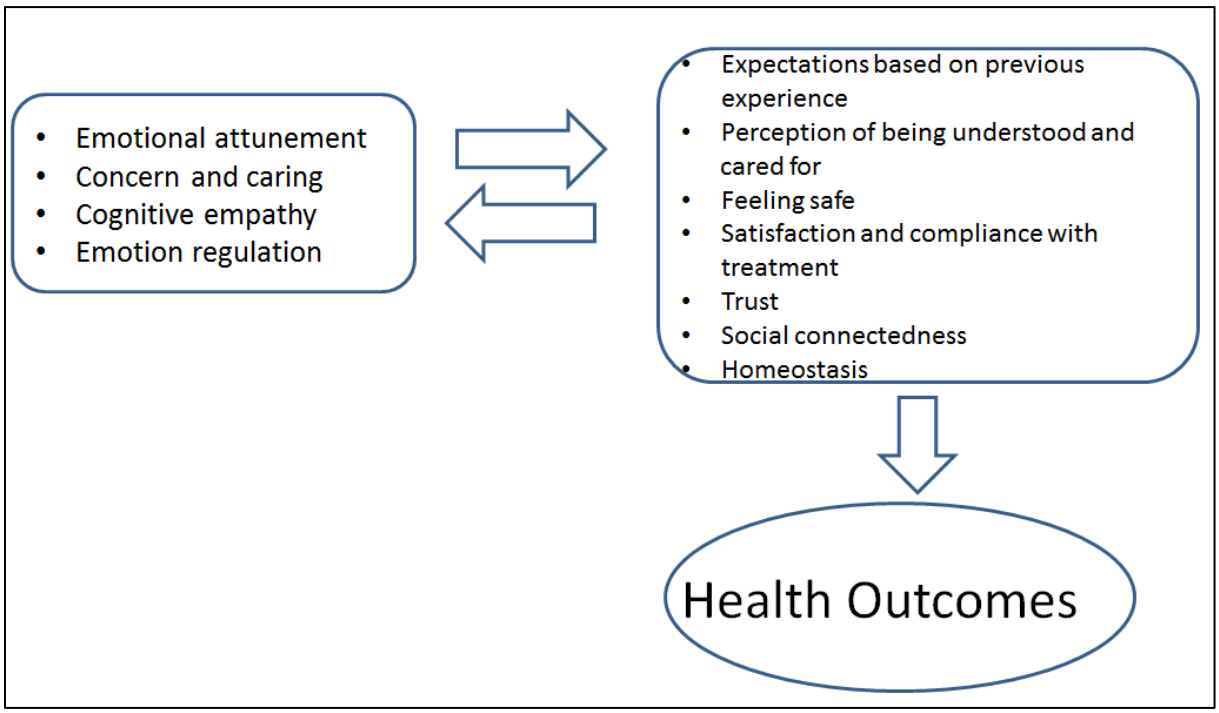

Figure 1: Framework of the Effect of Empathy in Medicine

Validated Measurements of Empathy

Given that empathy is a complex and difficult to define concept, the need to divide the process into its individual observable and measurable components is important to be able to develop validated assessment tools. In general, the cognitive aspect of empathy is referred to as Perspective Taking, emotive aspect is measured as Personal Distress, and the moral component is called Empathic Concern.

By the time of publication of Hemmerdinger's systematic review on empathy assessment tools, 36 reported measurement scales existed.[8] Empathy assessment tools generally come in three categories: self-rated (first person), patient-rated (second person), or observer rated (third person). After analyzing 1147 references, Hemmerdinger et al. deemed fifty studies to be relevant and 8 of those studies were shown to be validated and reliable (See Table 1).

Test	Type of Assessment	Notes
Medical Condition Regard Scale (MCRS)	1st person	This test assesses attitudes towards medical conditions. May be indicative of empathic understanding but not specifically an empathy test
Jefferson Scale of Physician Empathy (JSPE)	1st person	The most heavily researched test and specifically designed from scratch for the assessment of physician empathy
Davis' Interpersonal Reactivity Index (IRI)	1st person	Validity assessments were largely incidental to theory/model development. Not specific for physicians
Empathy Test (ET)	1st person	The ET was used as part of a larger screening and selection process for medical students
Empathy Construct Rating Scale (ECRS)	1st person	Scores correlated with BEES test. Not specific for physicians
Balanced Emotional Empathy Scale (BEES)	1st person	Scores correlated with ECRS test. Not specific for physicians.
Consultation and Relational Empathy (CARE)	2nd person	CARE draw heavily on nursing research and has been used in settings where empathy is explicitly treated as therapeutic
Four Habits Coding Scheme (FHCS)	3rd person	Correlations with patient evaluations are very poor

Table 1: Empathy Assessment Tools with evidence of reliability, validity, and internal consistency[8]

Benefits of Empathy

In society and nature, empathy has been shown to promote prosocial behavior. It helps protect the survival of our offspring and fosters communal relationships.[2]

In medicine, both the accrediting bodies of education for undergraduate and graduate medical trainees, as well as the Institute of Medicine, have called for a greater emphasis on patient-centeredness,[11] enhanced patient-physician communication, and teaching of empathy, but does empathy and communication improve outcomes for patients or benefit physicians? And what about its relation to the society at large?

Empathy and Patients:

Patient-physician communication has been widely studied in the field of clinical medicine and psychiatry. Despite general consensus that communication is the cornerstone to a therapeutic relationship, one study found that internal medicine physicians interrupt patients an average of 18 seconds into their history with biomedical questioning.[12] These interruptions switched the control from patient to physician. Those physicians, who let patients complete their stories in their own words, were able to hear more elements of the history suggesting improved diagnostic decision making. Further studies have shown that patients and physicians do not agree on their primary concern in 50% of visits and that 50% of psychosocial and psychiatric problems are missed all together.[13] In an ambulatory setting, patients who were allowed to state their medical problems in their own words and patients of physicians who provided more objective detailed explanation regarding illness and treatment had a significant decrease in blood pressure readings.[14] Furthermore, in psychiatric medicine, the patient-physician relationship independently influences outcomes regardless of pharmacotherapy and may even

be more important than the specific psychotherapy utilized.[15] Improved communications during history-taking and management discussion have been shown to decrease anxiety and psychological distress, reduce pain, increase overall health status, lead to more symptom resolution, and better blood pressure and glucose levels.[13]

The specific component of empathy within patient-physician communication has been suggested to affect these domains:

Anxiety and Personal Distress:

If patients perceive their general practitioner to be empathic, they feel less anxiety after their medical visit.[16] The same effect has also been shown in the oncology population.[17]

Satisfaction and Compliance:

Patients who perceive their physicians to be empathetic are more likely to be satisfied and refer their physician to family and friends (correlation factor 0.93 and 0.92 respectively).[18] Patients had increased rates of satisfaction, as well as compliance, if first, they felt a strong partnership with their physicians, secondly, perceived their physicians to communicate empathetically, and thirdly believed their physicians to have expertise in their field.[19]

Enablement:

Among complementary medicine and allopathic medicine practices, there was a direct positive relationship between empathy, patient enablement, changes in main complaint, and well-being, even amongst resource limited populations.[20-22] Furthermore, in an oncologic population, patients who rated their physicians to be more attentive and empathetic had increased self-efficacy, as well as improved satisfaction and decreased emotional distress.[17] Conversely, an increase in perceived physician stress, led to a decrease in patient reports of enablement.[23]

Health Outcomes:

Using qualitative methods, a study evaluating the experiences of patients who presented with a psychological problem revealed two major categories that patients identified as helpful in resolving their medical problems :[24] developing a working relationship and facilitating change. Within developing a working relationship, patients wanted their physicians to show interest and listen, show understanding and acceptance, and provide continuity. To facilitate change, patients felt physicians need to make sense of their problems, advise and facilitate decision making, and support action and progress.

A systematic review published by Di Blasi reviewed randomized controlled trials that looked at the effects of cognitive care and emotional care.[10] Cognitive care was defined as care that focused on influencing patients' expectations regarding their disease or management (ie, giving patient a clear diagnosis or positive prognosis); whereas emotional care was the manner in which the consultation was provided (ie, warm and friendly or firm and reassuring) with the purpose of allaying patients' negative emotions. Out of the 25 eligible trials, none looked at emotional care alone, but four evaluated 'positive

consultations' (cognitive care + emotional care) with the most consistent effect found when practitioners adopted a warm and friendly relationship with their patients (See Figure 2).

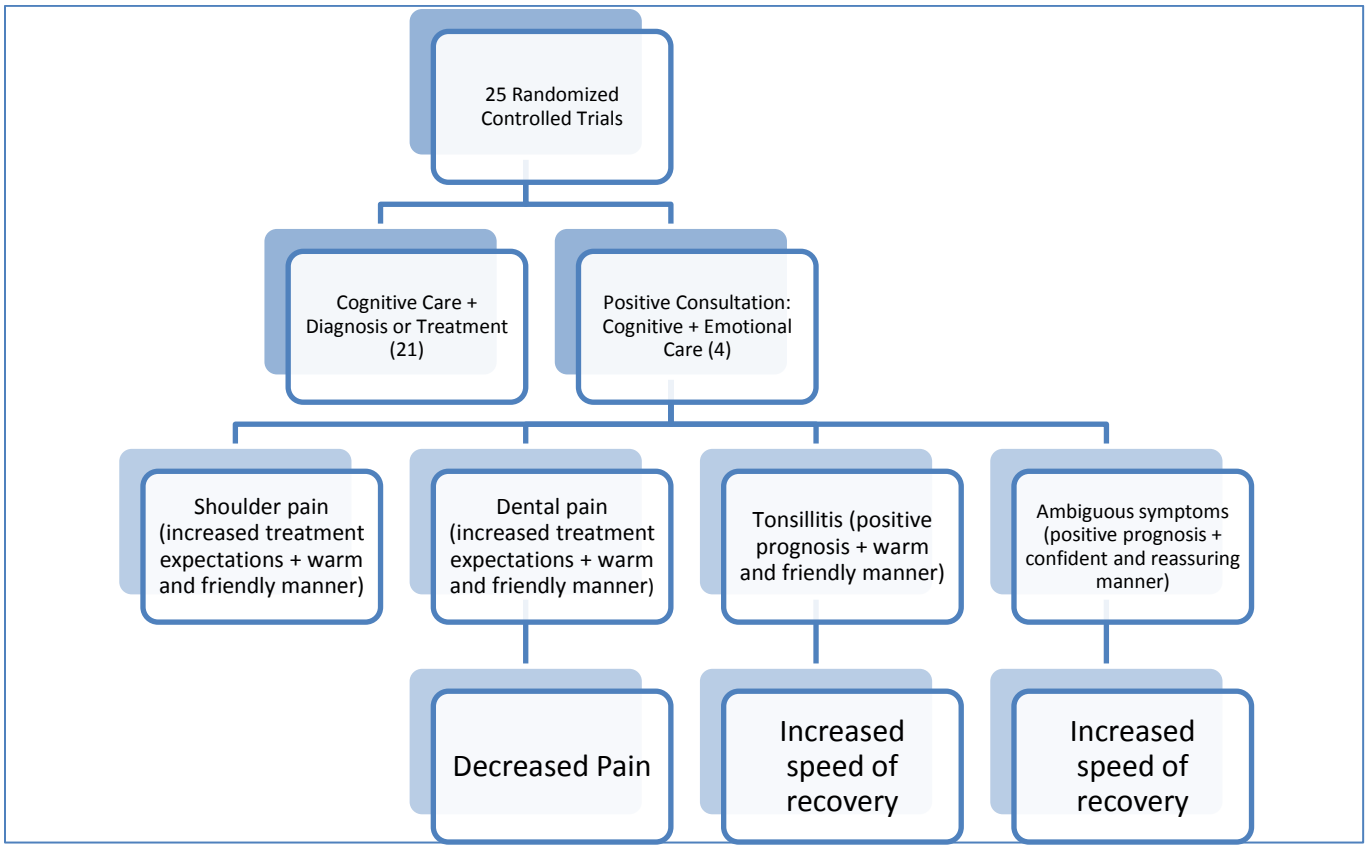

Figure 2: Influence of context effects on health outcomes: studies assessing the effects of 'positive consultations'[10]

In a university-affiliated family physician outpatient practice, physicians were classified into three groups based on their self-reported empathy scores (See Table 2).[25] Patients of physicians with higher self-reported empathy (JSPE) scores had significantly better glycemic control in their diabetics compared to those with low self-reported empathy scores. Similarly, physicians with lower empathy had a higher likelihood of uncontrolled diabetics. When comparing LDL-C control, comparable results were seen (See Table 3).

Groups	No. of physicians (no. of women)	Mean	SD	Range
High scorers	9 (5)	133.1	3.1	129–137
Moderate scorers	10 (6)	123.0	3.1	118–127
Low scorers	10 (5)	112.3	4.5	103–117
Total	29 (16)	122.4	9.3	103–137

* $F_{(2, 27)} = 77.0$, $P < .001$ (high scorers > moderate scorers > low scorers).

Table 2: Mean and Standard Deviation of the Jefferson Scale of Empathy Completed by 29 Participating Family Physicians, From a Study of Physicians' Empathy and Patients' Outcomes, Jefferson Medical College, 2009*[25]

Patient outcome	No. (%) of patients by levels of physicians' empathy		
	High (n = 205)	Moderate (n = 282)	Low (n = 404)
Hemoglobin A1c†			
<7.0%	115 (56)	139 (49)	163 (40)
≥7.0% and ≤9.0%	59 (29)	99 (35)	135 (34)
>9.0%	31 (15)	44 (16)	106 (26)
LDL-C‡			
<100	121 (59)	149 (53)	180 (44)
≥100 and ≤130	56 (27)	86 (30)	128 (32)
>130	28 (14)	47 (17)	96 (24)

* From a study of physicians' empathy and patients' outcomes, Jefferson Medical College.
† $\chi^2_{(4)} = 22.04$, $P < .001$.
‡ $\chi^2_{(4)} = 15.55$, $P < .001$.

Table 3: Frequency and Percent Distributions of the Hemoglobin A1c and LDL-C Test Results for 891 Diabetic Patients, Treated Between July 2006 and June 2009, by Levels of Their Physicians' Empathy[25]

When studying patients with the common cold, patients were randomized to no physician visit, standard visit (short encounter with limited eye contact and touch), and enhanced visit (incorporated PEECE techniques: positive prognosis, empathy, empowerment, connection, and education).[26] Patients who experienced enhanced visits were more likely to feel connected and like their physician. Patients of physicians who received perfect empathy scores had significantly shorter duration of symptoms (WURSS-21) as well as larger change in the biomarkers of inflammation,IL-8 and neutrophil levels (See Tables 4 and 5).

Characteristics	No Visit	Standard	Enhanced	*p-Value
Health status				
WURSS-21 (severity)	262.19 (214.18) $n=230$, (232.24, 292.15)	262.97 (206.03) $n=246$, (235.11, 290.83)	257.07 (224.33) $n=237$, (226.16, 287.98)	0.95
WURSS-21 (duration in days)	6.75 (3.50) $n=230$, (6.26, 7.24)	6.96 (3.36) $n=246$, (6.51, 7.42)	6.51 (3.58) $n=237$, (6.02, 7.01)	0.36
Psychosocial				
Empathy (CARE) scores	N/A	35.36 (9.58) $n=244$ (34.17, 36.56)	45.65 (5.19) $n=237$ (44.99, 46.30)	<0.001
Liking clinician	N/A	3.60 (0.91) $n=243$ (3.48, 3.72)	4.51 (0.65) $n=236$ (4.42, 4.60)	<0.001
Connectedness to clinician	N/A	2.88 (1.10) $n=243$, (2.74, 3.01)	3.95 (0.90) $n=236$, (3.84, 4.07)	<0.001
Objective markers				
IL-8 change	134.1 (3940), $n=221$, (−428.13, 696.24)	230 (6562) $n=234$, (−679.9, 1140)	628 (4767), $n=216$, (−60, 1316)	0.58
Neutrophil count change	−3.48 (181.40) $n=213$, (−29.85, 22.88)	11.95 (217.13) $n=224$, (−18.82, 42.72)	28.89 (169.77) $n=211$, (4.10, 57.68)	0.22
Length of visit	N/A	3:43 min (1:06) $n=233$	8:34 min (2:12) $n=224$	<0.001

* p-Values are based on one-way ANOVA for available data.

Table 4: Outcomes by treatment group (mean (std) followed by confidence interval)[26]

Empathy scores (CARE). Comparison between no visit, sub-perfect and perfect scores.

Characteristics	No visit ($n=236$)	Sub-perfect CARE score ($n=371$)	Perfect CARE score ($n=112$)	*p Values
Health status				
WURSS-21 (severity)	262.19 (214.18) $n=230$	270.58 (218.45) $n=369$	223.38 (97.14) $n=112$	0.04
WURSS-21 (duration)	6.75 (3.50) $n=230$	7.00 (3.46) $n=369$	5.89 (3.36) $n=112$	0.003
Feeling thermometer day 2	59.92 (18.04) $n=228$	57.88 (18.05) $n=363$	55.89 (18.74) $n=108$	0.31
Psychosocial				
Connectedness to clinician	N/A	3.10 (1.07) $n=366$	4.39 (0.74) $n=112$	<0.001
Liking clinician	N/A	3.80 (0.88) $n=366$	4.87 (0.37) $n=112$	<0.001
Objective markers				
IL-8 change	134.1 (3940), $n=221$	72 (4372.6) $n=343$	1585.5 (8884.2) $n=105$	0.02
Neutrophil count change	−3.48 (181.40) $n=213$	11.93 (200.58) $n=333$.	49.42 (177.68) $n=100$	0.09

* p-Values are only for testing the differences between perfect score and less than perfect score.

Table 5: Empathy scores (CARE). Comparison between no visit, sub-perfect, and perfect scores[26]

Empathy and Physicians:

Work Satisfaction:

In 2007, Neumann proposed a conceptual framework of patient-physician communication that illustrates how physicians can benefit from enhanced empathy with an increase in work satisfaction and decrease in burnout.[27] Later studies demonstrated that, in fact, specifically increased empathic concern and perspective taking (cognitive empathy) correlates to higher rates of compassion satisfaction.[3]

A study utilizing functional MRIs showed that physicians who had higher scores on perspective taking had higher satisfaction scores as well as activation of their reward centers (rostral anterior cingulate cortex) when treating patients in pain.[28]

Diagnostic Ability:

Amongst general practitioners, physicians who felt psychosocial aspects of patient care to be more important used more empathic and reassuring statements.[29] Moreover, they used fewer close-ended questions. These patients shared more information about psychological and social issues.

Malpractice Risk*:*

In medico-legal affairs, from reviewing deposition transcripts, plaintiff surveys and phone calls, the vast majority of malpractice lawsuits were found to be a result of the breakdown of patient-physician communication.[30]

Empathy and Society:

Neumann also proposed that improved communication also leads to decreased hospital stays and appropriate use of clinical testing.[27] A study performed on general practitioners used an audio tape to record standardized patient interviews. A third party observer reviewed the tapes and assigned a MPCC (measure of patient centered communication) score. Physicians who had higher MPCC scores had overall decreased diagnostic testing and total costs. Given primary care physicians cannot control hospital costs, inpatient costs were used as a surrogate to detect differences in severity of disease. Hospital costs were similar across the spectrum of MPCC scores solidifying that patient degree of illness did not contribute to the cost differences.[31]

Can Empathy Be Harmful?

Although previous studies have proven that empathy can enhance physicians' work satisfaction, can too much empathy potentially be detrimental to physician well-being? In clinical situations, physicians face emotionally taxing scenarios regularly, patients who are dying or are facing significant morbidity and social situations that seem irreparable. Are physicians being self-protective by not delving fully into their patients' stories? Many caregiving professions have shown that an empathetic person can become emotionally exhausted and suffer from compassion fatigue.[32] Influenced by a professional's innate empathic ability, skills at emotional regulation, personal experiences, stressors, and work/life balance, compassion fatigue can be caused by secondary traumatic stress or lead to burnout (See Figure 3) .[32] Investigating the neural origins of empathy can clarify the relationship between empathy, personal distress, and professional quality of life.

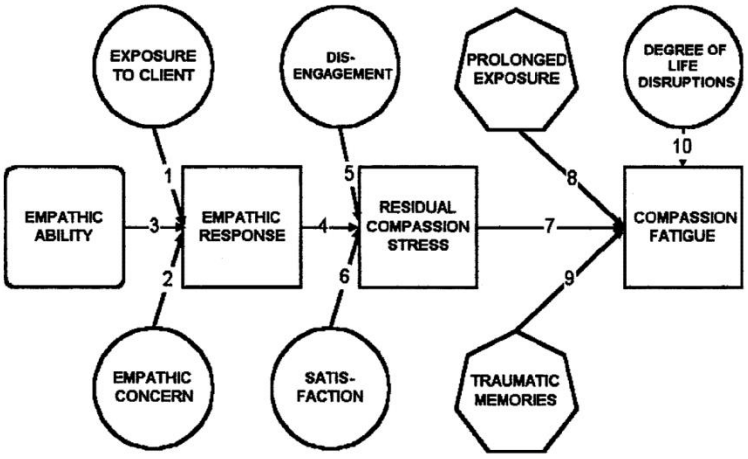

Figure 3: Compassion Stress and Fatigue Model[32]

Neurobiology of Empathy

Scientists' work with functional MRIs has given us the ability to map out the specific sections of the brain involved in the neural processing of empathy.[33] Many of the studies used to elucidate the neural pathways for empathy involve disgust and pain, given these are the easiest to trigger.

Functional MRIs and transcranial magnetic stimulation have uncovered motor and somatosensory areas of the brain that are involved in executing actions that are then reactivated when sensing a similar action performed by another. First discovered in monkeys, these pathways are called the mirror neuron system (MNS) (See Figure 4).

Comparing brain activity with subjects who had smelled an unpleasant odor to the same subjects watching an actor feign disgust after sniffing the contents of a glass, the same insular frontal opercular taste cortex (IFO) was shown to be affected. In patients who had injuries to this area of the brain, they were unable to feel disgust or recognize it in others.

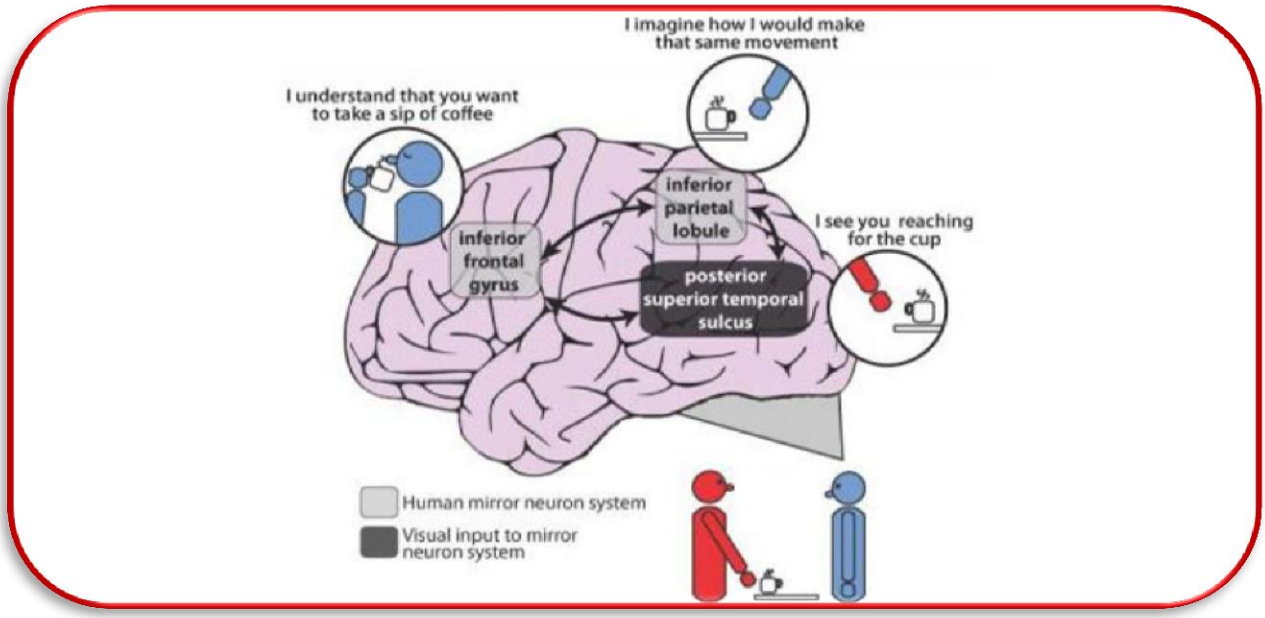

Figure 4: Illustration of Mirror Neuron System

With regards to response to pain, not only do people share affective stimulation but also motor and somatosensory activation found in the anterior cingulate cortex (ACC) region. Further evidence shows that cognitive perspective taking also correlates with activity in premotor and somatosensory areas during observation of actions.

Different factors have been suggested to modulate the MNS.[2] In some studies, the more a person attributes their own traits to another person and the more distress a person feels when witnessing discomfort, the less strong the empathic response is seen in the motor and somatosensory regions. In other words, increases in personal distress may affect their ability to take another's perspective. Both

anxiety and tension have also been found to dampen neurological signals within the mirror neuron system.[27] Experienced physicians have also been shown to down-regulate their pain response, not only from a higher cognitive perspective but beginning with the affective pathways or 'emotional contagion'.[34]

The subject of the experience also affects the neural response. If the person experiencing pain is a loved one or imagined to be a loved one over a stranger, the empathic response is stronger.[2] Additionally, studies have illustrated if the person who is experiencing pain is deemed unfair in character, the perceived pain is less, especially if the observer is male.[35] Many studies have investigated the effects of the gender of the physician on biases, however, Gleichgerccht et al. demonstrated that it if the patient was female, the physician of any gender perceived the pain intensity to be greater.[2]

As VS Ramachandran of the Center for Brain and Cognition in UC San Diego predicts, "Mirror neurons will do for psychology what DNA did for biology: they will provide a unifying framework and help explain a host of mental abilities that have hitherto remained mysterious and inaccessible to experiments."

Personal Attributes and Empathy

Through neural pathways, it has been shown that empathy can be rewarding but can also cause tension and anxiety. Two large scale studies done in South America (7,584 practicing physicians and a subset of 1,199 physicians within the same cohort) investigated specific components of empathy, as well as other factors of altruism and emotional processing, associated with professional quality of life (compassion satisfaction, burnout, and secondary traumatic stress).[2,3] Another study randomly selected 50 medical schools and sampled first-year medical students to determine what personal, dispositional, and socio-economic factors played a role on a student's attitude toward empathy, as measured by the JSPE.[36]

Measured Components Contributing to Professional Quality of Life:

Empathy:

Using the Interpersonal Reactivity Inventory, physicians were measured on three specific components of empathy: Empathic Concern (the ability to have feelings of warmth, compassion, and concern for other people), Personal Distress (the tendency to feel personal discomfort when confronted with an emergency or emotionally tense situation), and Perspective Taking (the cognitive ability to understand another's point of view).[2] The second physician study also had participants watch 12 video clips showing a person exhibiting a facial expression of pain, and subsequently asked them to rate the perceived pain intensity and their subjective level of personal distress.[2]

Alexithymia:

Alexithymia is an inability to describe one's feelings or emotions and is a characteristic seen in patients in the Autism spectrum. Three components are assessed on the Toronto Alexithymia Scale: Difficulty Describing Feelings, Difficulty Identifying Feelings, and Externally-Oriented Thinking (one's inclination to focus on the external world and avoid reflection).

Altruism:

To determine if helping others contributes to professional quality of life, physicians were surveyed to ascertain the relationship of total altruistic scores and the specific types of altruistic behavior, direct altruism (the subject of an altruistic act is specific, ie mentoring an at-risk child) or indirect altruism (the subject of the act is theoretical, ie donating blood).

Professional Quality of Life:

The Professional Quality of Life Scale V encompasses both the positive and negative aspects of medical practice: Compassion Satisfaction (enjoyment from doing one's job well) and two components of Compassion Fatigue, Burnout (feelings of hopelessness and dejection with decreased ability to do one's job) and Secondary Traumatic Stress (work-related exposure to distressing events). Compassion Fatigue is a phenomenon experienced by professionals who work in high emotionally demanding jobs. Similar to Post Traumatic Stress Disorder, it is the emotions that result from empathizing with someone who has gone through a traumatic experience.[32]

Results

Gender, Experience, and Practice Characteristics:

Evaluating the effects of gender on the specific components of empathy, women were shown to have statistically significant increased empathic concern in both the physician and medical student study, but that did not translate to differences in compassion fatigue or compassion satisfaction.[3,36] Also, physicians who experienced high compassion fatigue but little to no compassion satisfaction had more "on-call" shifts whereas those physicians who had high compassion satisfaction but little to no compassion fatigue worked the least number of "on-call" shifts.[3] Older and more experienced physicians rated patients' pain intensity significantly lower, a similar result as seen in a previous study when comparing experienced physicians to controls, but that did not correlate to reports of induced personal distress.[2,34]

To investigate the interactions between the various dispositions, multiple regression analyses were performed for its effects on compassion satisfaction, burnout, and secondary traumatic stress:

Empathy:

Empathic concern predicted all aspects of professional quality of life significantly, whereas perspective taking only predicted compassion satisfaction.[3] Both empathic concern and perspective taking positively predicted attitudes toward empathy in students.[36] Personal distress, as reported by the IRI, on the other hand, significantly predicted both domains of compassion fatigue but was inversely related to compassion satisfaction (See Table 6).[3] However, when comparing physicians' reports of induced personal distress after viewing the video clips, the more pain intensity a physician perceived, the more personal distress was reported by the physician.[2] Those physicians who reported a higher pain intensity had significantly higher scores on the IRI subscale of perspective taking. The physicians who expressed more tension when viewing a patient in pain, had significantly higher domains of perspective taking as

well as empathic concern. Physicians who experienced more compassion satisfaction had significantly higher reports of induced personal distress but no difference in ratings of pain intensity. There were no

		Compassion Satisfaction	Burnout	Secondary Traumatic Stress
R		.43	.32	.56
Adjusted R square		.18	.10	.31
F (8,1872)		51.7	26.3	106.5
P		<.001	<.001	<.001
Empathy	EC	$\beta = .12$, $p < .001$	$\beta = .11$, $p < .001$	$\beta = .13$, $p < .001$
	PD	$\beta = -.22$, $p < .001$	$\beta = .14$, $p < .001$	$\beta = .35$, $p < .001$
	PT	$\beta = .13$, $p < .001$	$\beta = -.03$, $p = .28$	$\beta = -.04$, $p = .10$
Alexithymia	DDF	$\beta = -.07$, $p = .04$	$\beta = .04$, $p = .24$	$\beta = .06$, $p = .03$
	DIT	$\beta = -.07$, $p = .02$	$\beta = .18$, $p < .001$	$\beta = .26$, $p < .001$
	EOT	$\beta < .01$, $p = .98$	$\beta = -.04$, $p = .08$	$\beta = .03$, $p = .23$
Altruism	ALT-D	$\beta = -.02$, $p = .35$	$\beta = .03$, $p = .23$	$\beta = .04$, $p = .07$
	ALT-I	$\beta = .19$, $p < .001$	$\beta = .08$, $p < .01$	$\beta = .04$, $p = .07$

Beta values are standardized coefficients.
EC = Empathic Concern, PD = Personal Distress, PT = Perspective Taking, CS = Compassion Satisfaction, BO = Burnout, STS = Secondary Traumatic Stress, DDF = Difficulty Describing Feelings; DIF = Difficulty Identifying Feelings; EOT = Externally-Oriented Thinking; TOT = Total Alexithymia score; ALT = Total Altruism score; ALT-D = Direct Contact Altruism; ALT-I = Indirect Contact Altruism.

Table 6: Multiple regression analysis on the positive (CS) and negative (BO, STS) aspects of Professional Quality of Life[3]

significant differences for physicians in the sub-categories of compassion fatigue on their perceptions of pain intensity or inducible personal distress. However, physicians who experienced both compassion satisfaction and fatigue as compared to those who experienced compassion fatigue alone, had significantly higher perceptions of pain intensity and even more statistically significant feelings of distress suggesting that there is a certain amount of emotional attunement needed to reap the benefits of empathy (See Figure 5).

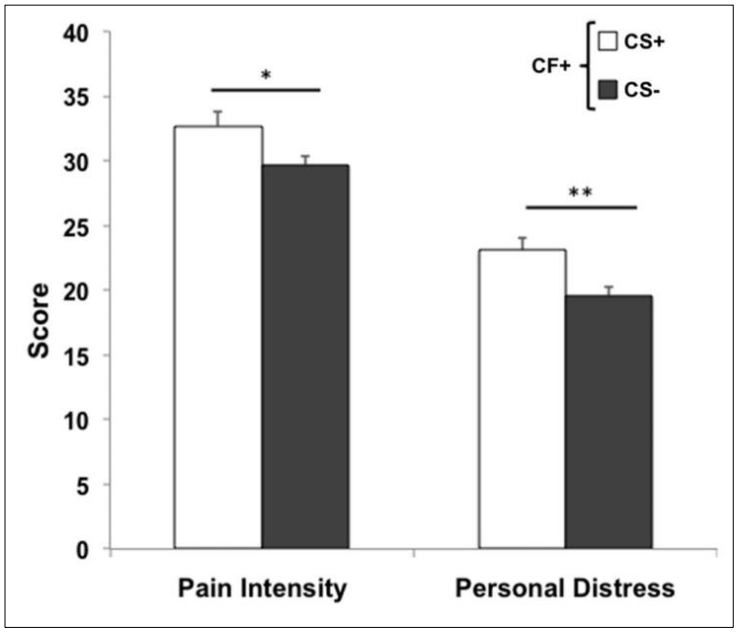

Figure 5: Comparison of pain intensity and personal distress in physicians who all had compassion fatigue (CF) but with or without compassion satisfaction (CS) (* p<0.05, ** p=0.01)[2]

Alexithymia:

Difficulty describing and identifying feelings both had a strong correlation with burnout and secondary traumatic stress. Externally oriented thinking did not have a significant correlation to either compassion satisfaction or fatigue (See Figure 6) .[3] When comparing the different effects of alexithymia on physicians professional quality of life, those who had no alexithymia had significantly higher compassion satisfaction scores and lower burnout and secondary traumatic stress scores compared to those with either borderline or alexithymia ($p < 0.001$). In regards to the effect on empathy, a similar effect was seen. Those physicians who had no alexithymia had significantly more empathic concern ($p = 0.01$) and perspective taking ($p < 0.001$) but less personal distress ($p < 0.001$). (See Figure 6)

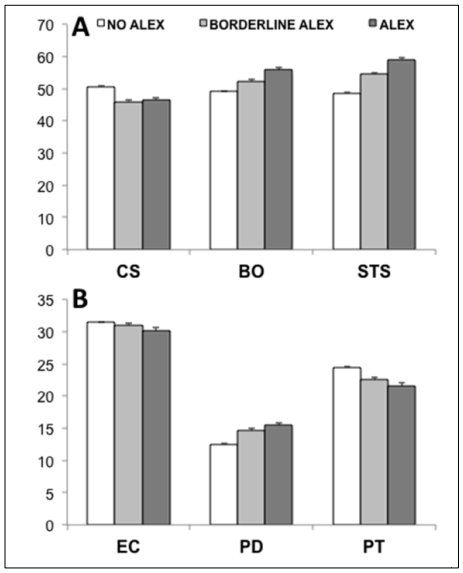

Figure 6: Comparison of (A) professional quality of life and (B) empathy across physicians who had no alexithymia, borderline alexithymia and alexithymia, as determined by their scores on the TAS-20.[3]

Altruism:

Indirect altruism, as opposed to direct altruism or total altruism scores, was the only factor found to have a significant correlation with professional quality of life, with a stronger effect on compassion satisfaction and smaller, but significant, effect on burnout. (See Table 6)

Sociopolitical Attitudes, Socioeconomic Status, Self-concept and Well-being:

For medical students, demographic factors such as an undergraduate degree in science, technology, engineering or mathematics, South Asian race, or male race had a decrease in JSPE scores.[36] If students were uncomfortable with uncertainty, close-minded, more elitist or believed in medical authoritarianism, they also had lower empathy scores. However, increased global self-esteem positively predicted higher positive regard for clinical empathy.

Empathy during Medical Training

A systematic review on studies measuring empathy trends in medical students and residents included 18 studies from the US, UK, and Poland.[37] 9 out of eleven studies in medical students revealed a decrease

in self-reported empathy during medical school. All seven of the studies involving residents showed a decrease in empathy. All of these studies were performed at a single-institution.

Various medical student studies have shown a significant decline in empathy once students entered their clinical clerkships.[1,38-41] Some studies have also demonstrated that women have higher baseline empathy scores than men,[38,40,42,43] but may have an increased rate of decline in empathy.[41,43,44] Students who choose people-oriented specialties have higher empathy scores than those who choose technology-oriented specialties (See Table 7).[38,40,41] Additionally, students who entered medical school through a 7-year program had lower empathy scores than students who matriculated through the traditional 4-year pathway.[1] Empathy has not been correlated with increased academic success or improved test scores.[39,44]

Table 7: People-oriented vs Technology-oriented specialties[1]

"People-Oriented" specialties	"Technology-Oriented" specialties
Internal Medicine	Pathology
Family Medicine	Surgery and Surgical Subspecialties
Pediatrics	Radiology
Neurology	Radiation Oncology
Rehabilitation Medicine	Anesthesiology
Psychiatry	
Emergency Medicine	
Obstetrics and gynecology	
Ophthalmology	
Dermatology	

In a longitudinal cohort study done at Boston University Medical School, Chen et al showed that medical student empathy did improve after enrollment.[1] However, self-reported empathy scores began to decline as they began direct contact with patients, resulting in a statistically significant decrease in empathy when comparing the beginning of the clerkship period to the end of medical school (See Figure 7). When the scores were divided up into tertiles, the rate of decline during the clerkship period was much steeper for the moderate and low scorers (See Figure 8).

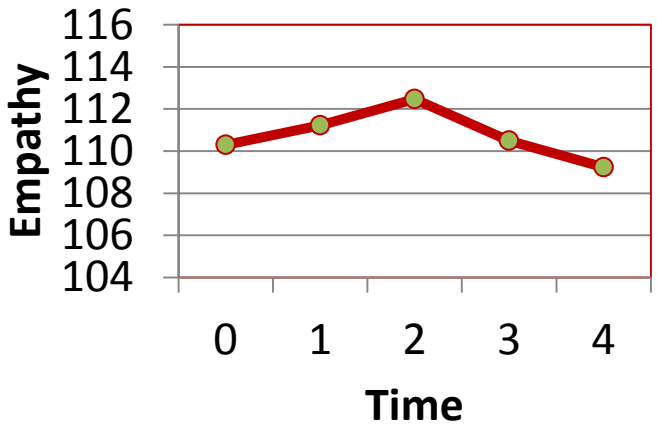

Figure 7: Student Empathy Scores Over Time[1]

All of the resident studies included in Neumann's review reported a decrease in empathy although some observed declines in empathy were not statistically significant.[37] These studies also looked at the relationship between empathy and professional quality of life, depression, and burn-out. Commonly, residents experienced more depression and burnout.[45-48] In one study, residents reported more depression, anger and fatigue, with levels peaking at 8 months into intern year and never returning to baseline.[45] Whereas residents that had a higher level of mental well-being had higher empathy scores.[49] Another study showed increased medical errors with residents who had more burnout or personal distress.[50] Similarly to the medical school population, medical knowledge as measured by the in-training exam had no correlation to empathy.[48]

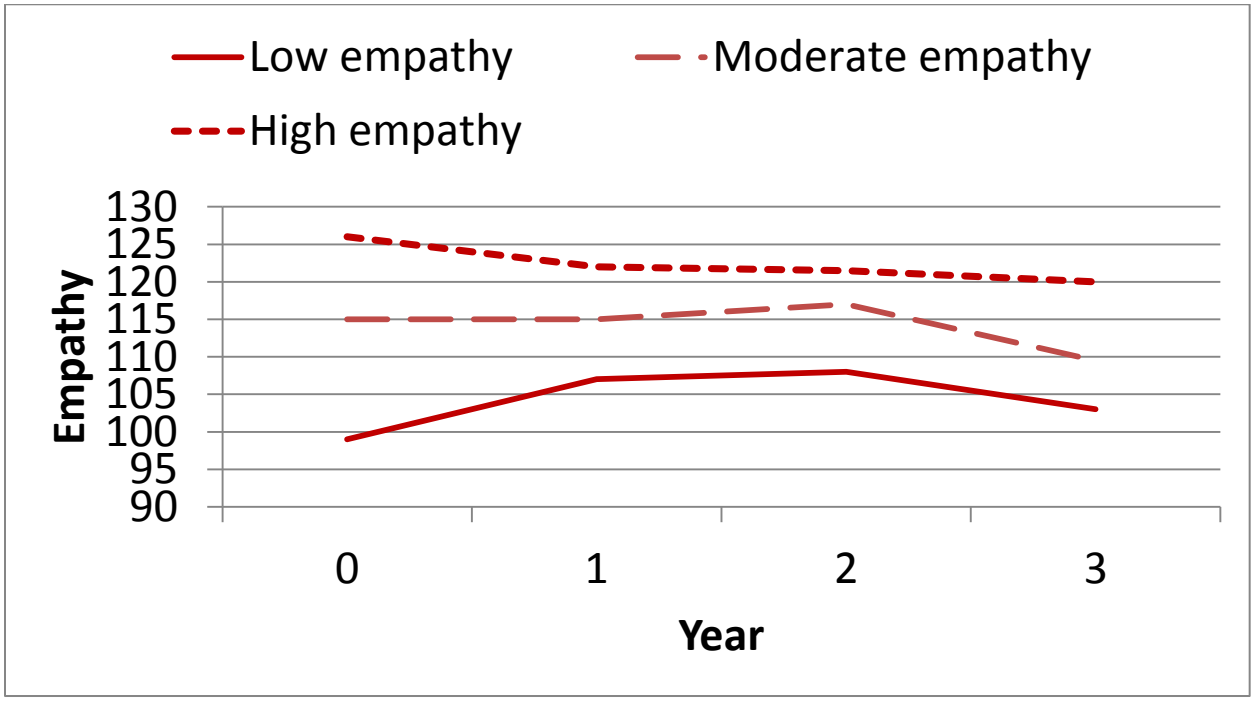

Figure 8: Empathy trajectories over time, by baseline levels of empathy (tertiles)

<u>Etiologies of Loss of Empathy</u>

In a study surveying over 1,000 medical students, decreases in emotive and cognitive empathy in men were due to depersonalization, whereas in women depression also contributed to a decrease in emotive empathy. On the other hand, a sense of personal accomplishment led to an increase in both emotive and cognitive empathy for both men and women.[51] In Neumann's systematic review, burnout, depression, low sense of worth, and decreased quality of life were all implicated as factors that led to decrease in empathy. Many hypotheses exist as to why medical students and residents experience distress during training and these center around the formal and hidden curriculum.[37]

Formal Curriculum:

Inpatient medicine is a different setting than practiced twenty years ago. The fragmented healthcare system may be a difficult learning environment.[1,40] Little time is left to process and delve deeply into a

patient relationship or the pathophysiology of their disease before a new patient must occupy that space. Moreover, very rarely do trainees have continuity of care with these patients. Secondly, technology has vastly changed the structure of healthcare interactions. Bedside interactions have been replaced with screen time, where trainees forage for data and possible diagnosis and management plans.[38] Our current model of apprenticeship involves pairing trainees with other trainees, who are suffering from similar stressors and may not be the ideal role models. This is further suggested by other countries who see a decline in empathy in their larger university students practicing in a similar structure but not in their smaller university students who work in silos or are paired with a more experienced mentor.[52] All of these scenarios are a stark reality to their own idealistic view of medicine and the Hollywood portrayal of the physician as superhero.[41]

Hidden Curriculum:

The hidden curriculum is defined as that which is implicitly taught but not explicitly stated. Many institutions have students compose reflection pieces on their experiences during their clerkships. One study analyzed their students' papers and found some common themes (See Table 8).[53] With regards to power and hierarchy , the mistreatment of students by mentors, including humiliation, gender-specific discrimination and sexual harassment, has been self-reported and is a nationally regarded issue.[41] Another potential cause of distress is the lack of social support in combination with a high workload. Students and residents work long and varied hours that leaves little time to visit family or spend time with their personal support groups.[37] Furthermore, perhaps trainees are simply protecting themselves against compassion fatigue in a vulnerable environment. This idea is bolstered by previously discussed studies illustrating a physician's natural mechanism to down-regulate the early, emotional sharing component of empathy**.**

Nine Common Themes
Power and hierarchy
Patient dehumanization
Hidden assessment
Emotional suppression
The limits of medicine
Emerging accountability
Balance and sacrifice
"Faking" it
Human connection

Table 8: Nine Common Themes found in Narrative 3rd Year Student Reflection Essays[53]

Interventions to Improve Empathy

A systematic review from 2015, initially reviewed over 1,000 articles and found 64 qualifying studies that investigated a quantitative change in empathy in trainees and practicing physicians.[54] Two-thirds of these studies found a significant increase in empathy. After dividing the studies into three tiers based on quality metrics, 14 out of 19 of the more rigorous trials (randomized with either validated and/or reliable measures) demonstrated a significant increase, with two trials with mixed results, and three trials with no change in empathy. The Tier 1 trials (randomized and used validated measures) had a heterogeneous population of medical students, residents, fellows, and physicians. Furthermore, they employed many types of interventions and used many different measurement reports. In the end, half of these Tier 1 trials showed a lasting effect, one to six months post-intervention.

Another review looked at not only quantitative measures but qualitative measures as well.[9] Fifteen studies were included and 7 of the 8 quantitative studies showed a statistically significant increase in empathy while all 6 of the qualitative studies reported an increase in empathy. These studies utilized different interventions focusing on different components of empathy such as behavioral, emotive, and cognitive, in addition to experiential studies and self-care. The results are summarized in the following tables (See Tables 9, 10, and 11).

Table 9: Quantitative studies focusing on behavioral interventions on empathy[9]

Aspect	Study	Participants	Intervention	Outcome Measure	Results	Effect Size of statistically significant changes
BEHAVIORAL	Kramer et al	RCT 40 students in 1st clinical yr	Interpersonal skill workshop given in 5 h over 5 wks	Observed 2 interviews (not validated)	Effect lasted at 6 and 12 months	Pre- to postint: 2.0 imm 2.4 at 6 mos 1.3 at 12 mos Control to int: 2.0 imm 2.1 at 6 mos 1.9 at 12 mos
	Evans et al	RCT 55 students in 1st clinical yr	11 hours of communication and skills workshop	IRI AES HRS subset	Only HRS subset showed change	Pre- to post int: 0.45 on HRS Control to int: 1.6 on HRS
	Poole and Sanson-Fischer	Longitudinal controlled 45 students in final clinical year who had intervention during preclinical training	16 h of audiotape-led communication skill workshop	AES	Effect lasted at 3 yrs	Pre- to postint 217.8 imm 6.5 at 3 years Conrol to int: 2.1 at 3 yrs
	Sanson-Fischer and Poole	Prospective controlled 112 preclinical students	16 h of audiotape-led communication skill workshop	AES		Pre- to post int: 9.1 Control to int: 6.1
	Winefield and Chur-Hansen	Pre-post comparison 107 preclinical students	3h of communication skill workshop	Written empathy test (not validated)		Pre- to post int: 1.7
	Fine and Therrien	Prospective controlled 43 self-selected preclinical students	12 h interpersonal skill workshop	Modified AES (not validated)		Statistically significant changes but not enough data to calculate effect size

IRI=Interpersonal Reactivity Index=Validated, written self-evaluation
AES=Accurate Empathy Scale=Validated, assessment by trained observer
HRS=History-taking Rating Scale=Validated, assessment by trained observer (spec to medicine)

Aspect	Study	Participants	Intervention	Outcome Measure	Results	Effect Size of statistically significant changes
EMOTIVE AND COGNITIVE	Shapiro et al	Modified cohort controlled study 22 self-selected preclinical students; randomized to experimental and control groups	8 h literature and medicine course	ECRS, BEES, Qualitative group interview	BEES showed benefit Qualitative analysis showed student's understanding of pt became more complex and detailed	Pre- to postint on BEES: 0.59
	Shapiro and Hunt	Case study of 69 self selected-students	Attend theatrical performance	Informal feedback		Increased empathy reported (qualitative study)
	DasGupta and Charan	Case study of 11 self-selected preclinical students	6 wk Reflective writing seminar	Qualitative analysis of written course evaluations		Increased empathy reported (qualitative study)
	Lancaster et al	Case study of 5 self-selected students in first clinical year	4 wk/16 h literature and medicine course	Qualitative analysis of written responses to course questions		Increased empathy reported (qualitative study)

ECRS=Empathy Construct Rating Scale=Validated, written self-evaluation
BEES=Balanced Emotional Empathy Scale=Validated, written self-evaluation

Table 10: Quantitative and qualitative studies focusing on emotive and cognitive interventions on empathy[9]

Table 11: Quantitative and qualitative studies focusing on experiential and self-care interventions on empathy[9]

Aspect	Study	Participants	Intervention	Outcome Measure	Results	Increased Empathy Reported
EXPERIENTIAL	Henry-Tillman et al	Pre-post comparison of 87 preclinical students; 59 other students were assigned to intervention but did not complete it	Accompany and assist patient during 1 clinical visit	Written survey (not validated) Qualitative analysis of group discussion	No significant change on written survey	Yes
	Wilkes et al	Case study of 9 self-selected preclinical students	Student hospitalization experience lasting 24-30h	Qualitative analysis of verbal responses		Yes
SELF-CARE	DiLalla et al	Cross-sectional survey 1181 students and physicians at various levels of training and practice	Empathy, spirituality, and wellness courses of unspecified length	ESWIM (written, not validated)		Empathy score higher for students who attended wellness courses or Empathy + Spiritual courses, Spiritual but no empathy = lower scores

ESWIM=Empathy, Spirituality, and Wellness in Medicine survey (specific to medicine, not validated)

In Conclusion

Empathy has many desirable benefits to patients, physicians, and society, but it is a complex and multi-dimensional construct. Physiologic and emotional responses are intertwined with our natural dispositions, empathic abilities, and environment to contribute to the development of compassion satisfaction and compassion fatigue. We do know that empathy positively contributes to our joy in practice. However, there are many obstacles common to all of us in today's world that can erode that joy. Measures to preserve a physician's compassion and joy do exist although much more research needs to be done. We, as medical educators, are responsible for providing our trainees with an environment that not only minimizes these obstacles but role models and builds the positive aspects of empathy.

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