

## Original Research

# Empathy, Arrogance and Social Desirability Among Medical Students in Puerto Rico: An Exploratory Study Post-Hurricane María

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## ABSTRACT

### Introduction

Medical and psychological literature finds that empathy is crucial in the doctor-patient relationship, and that in the last 30-years there has been a decrease among college students, particularly medical students. After the passing of Hurricane María in Puerto Rico, many medical professionals migrated, leaving the island with fewer specialists to teach the remaining medical community. This is the first such study conducted with medical students in Puerto Rico. It examines the perception of empathy from the medical student perspective amidst the particular historical context of a national emergency.

### Method

Three instruments were used: The Jefferson Scale of Empathy (Student Spanish Version) (JSE-S), Arrogance Scale (AS) and Social Desirability Scale. A Non-Experimental Correlational Exploratory study was carried out with 200 medical students (55.5% female; 44.5% male), who were coursing third (45.5%) or fourth year (54.5%), from three major medical schools on the island. The students signed informed consents and also answered sociodemographic questions.

### Findings

The JSE-S demonstrated an acceptable internal consistency reliability ( $\alpha=0.79$ ) with 11 items and three underlying factors. Female students showed higher empathy scores than their male counterparts ( $M=73.96$  vs.  $M=70.22$ ,  $p=0.001$ ). The JSE-S and the AS were inversely correlated. Results support that social desirability is not statistically significant as a moderator between empathy and arrogance. Significant differences were found on arrogance scores pertaining to medical specialty and on religious background. Empathy and arrogance were unrelated to age, coursing year, income or university of precedence.

### Conclusions

Raising awareness about the importance of empathy through positive role modeling, interpersonal dynamics and valuing the doctor-patient relationship through the formative years of medical school is recommended.

### Keywords

Empathy; Jefferson Scale of Empathy; Medical students; Puerto Rico; Arrogance; Social desirability.

## INTRODUCTION

Historically medicine, is universally considered a noble profession, even a “sacred calling”, to serve the needs of the ill and even face mortality in the hope of extending life. Physicians have been recognized as educated scholars who are dedicated to

serve their communities.<sup>1</sup> “There is a concern among educators that clinical training may have an adverse effect on medical residents’ and students empathy”.<sup>2</sup> Part of the ethic in medicine, and what should be emphasized during a student’s medical training, is to “learn the qualities of humility and ethical behavior from the professors whom they admire and wish to emulate”.<sup>1</sup> The literature suggests that physicians’ interpersonal

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skills are critical to establish positive and trustful physician-patient relationships<sup>3</sup>; having empathy towards one's patients contributes to better emotional communication and pro-social behavior.<sup>4</sup>

The new globalization informatics era has created greater public awareness of health and medicine, and with it, the emergence of the health care management system. Is it possible that this emphasis on the business aspect of medicine has diminished the humane doctor-patient relationship?

The physician has become a 'provider' and the patient a 'health consumer...' this distancing of the doctor from the patient breeds a kind of 'system arrogance,' in which the patient is no longer seen as a human being but simply as a job to be done cost-effectively.<sup>1</sup>

Could it be possible that the business model of medicine has managed to create the "zeitgeist" of redefining not only the physician's role in medicine but also, how high of a value he or she perceives to have in comparison to others? "Every age develops its own peculiar forms of pathology, which express in exaggerated form its underlying character structure".<sup>5</sup> Social critics and psychological theorists argue that contemporary culture, notably, North American society, has become excessively narcissistic,<sup>5</sup> competitively individualistic<sup>6</sup> and consumption-focused,<sup>7,8</sup> highlighting the ideology of rampant capitalism. Such dispositions are fostered by the social, historical, political and economic context in which people are embedded.<sup>9</sup> Thus, it is likely that physicians who project the images of "scholars", "saviors" and "providers" are not exempt from internalizing such dispositions.

Is it possible that even among these dedicated individuals that look out for the health and well-being of others there may be ones who are cold, arrogant and even self-centered? Do medical students consider themselves empathetic during their training? Does the rigorous medical training entitle them to become more arrogant? Is it possible to be both empathetic and arrogant at the same time? Do such dispositions have any influence on forming relationships that can affect the patient's outcomes? Does social desirability influence being empathetic or arrogant? These are some of the questions that we attempted to address in this exploratory study. There is no known study of these constructs, and their relationships among medical students in Puerto Rico. The larger intent of this study is to increase awareness that empathy is important in the medical profession.

## LITERATURE REVIEW

Current college students are not as empathic as students from the 1980's decade or even the 1990's, and the largest decrease in empathy has been registered after the year 2000.<sup>10</sup> A cross-temporal meta-analysis was conducted on American college students from 72 samples that examined empathy among 14,000 students throughout the last thirty years, between 1979 and 2009. The result shows that college students are 40% less empathetic than their peers, twenty or 30-years-ago.<sup>10</sup> This is alarming because it means that college students are becoming less empathic. The development of

empathy is one of the most important attributes that can lead to effective communication between doctors and their patients.

Research has also shown gender differences with higher levels of empathy found in females compared to male medical students.<sup>2,11-13</sup> It has also shown that students who were more focused in people-oriented specialties scored higher empathy levels than those who were more in technology-oriented specialties.<sup>2</sup> The author's argue that career preferences that change during the first three years of school may be partially influenced by change in empathy, but more studies are needed to confirm this. There are two necessary conditions to induce empathy: perceiving other people's needs and adopting their perspectives.<sup>14</sup> In the medical context for empathy to be effective it must be perceived by the patient.<sup>15</sup>

Some studies have shed light on the patient's perspectives towards the physician's behavior. A qualitative study in which telephone interviews were conducted with 192 patients who were seen in 14 different medical specialties at Mayo Clinic, asked participants to mention their best and worst experiences with a physician. The results showed that "the ideal physician is confident, empathetic, humane, personal, forthright, respectful and thorough".<sup>3</sup> On the other hand, the "worst physician" shows the opposite characteristics, such as being "...insensitive, (display) disrespectful behavior... and dismiss the patient's input".<sup>3</sup> Taking cues from this, medical schools would be best advised to train future physicians to display behaviors that can lead to satisfied patients, and to better outcomes.

The term "arrogant" is a sociological concept and a personality trait that people perceive in others, a notable characteristic of the western culture.<sup>16,17</sup> Arrogant people are those who perceive themselves as better than others or superior to all others, either for reasons of overvaluation of themselves or for their success in various personal or professional areas.<sup>16</sup> In the medical context arrogance can be manifested in diverse ways such as "lack of respect, consideration, and good manners toward patients, nurses and other staff; failure to pause and listen, being abusive or critical of subordinates, sometimes even in patient's presence".<sup>1</sup> It is important for physicians to be aware that they may project arrogance while intending to project competence,<sup>18</sup> by presuming to know everything, ignoring common sense, making rash decisions and neglecting to consult with co-workers.

## Justification and Objectives

This study examined the relationship between empathy and arrogance among medical students in training. It's the first study, to our knowledge, conducted in Puerto Rico with this specific population using measures that were valid for Puerto Rico. After Hurricane María during 2017, a massive migration to the United States occurred. According to the U.S. Census Bureau, during the year 2017 over 130,000 people migrated from Puerto Rico to the United States.<sup>19</sup> Moreover, Puerto Rico had been going through a decade-long recession, and during that time many physicians left for the mainland motivated by higher salaries and better benefits. Students also left during that time with the hope of having more options for medical subspecialties.<sup>20</sup>

In the aftermath of María, and with fewer physicians available many professionals had their hands full with an overflowing schedule.<sup>21</sup> It would be expected that more than ever under such traumatic circumstances physicians would be empathetic towards their patients. Is it possible that a certain type of arrogance flourished because time was more limited, and their short interactions may have had aversive effects on the patient-physician relationship?

The objective of this study was to get to study the physicians in training one year after Hurricane María in terms of how they perceive themselves and the level of empathy they show towards their patients.

The first objective was to validate the Jefferson Scale of Empathy (Student-Spanish Version) that would allow the scale to be used in the student population to measure empathy. The second objective was to identify if the arrogance scale (AS) negatively correlated with the Jefferson empathy scale (JES-S). The third objective was to identify if social desirability was a moderator between empathy and arrogance. Finally, the fourth objective was to determine if the sociodemographic variables presented any differences among the levels of arrogance and empathy in the medical student sample. Examining these constructs and their relationships may lead to the promotion of self-care, (how one projects towards others) as well as enhance interpersonal and doctor-patient relationship.

The hypotheses were based on the literature examining empathy and arrogance. For this study, medical students were chosen to be assessed from different cohorts, particularly third and fourth-year students, because at this stage they would be attending to patients.

## EXPLORATORY HYPOTHESIS

### First Hypothesis (H1)

The JSE-S and the AS will be inversely correlated; higher the score on the Jefferson Scale of Empathy, lower the score in the arrogance Scale. Second hypothesis (H2): Social Desirability will significantly moderate the relationship between empathy and arrogance. Third hypothesis (H3): Females will score higher on Empathy compared to males. Fourth hypothesis (H4): males will score higher on arrogance compared to Females. Fifth hypothesis (H5): Technology-oriented specialties will score higher on arrogance compared to people-oriented specialties. Sixth hypothesis (H6): People-oriented specialties will score higher on empathy compared to technology-oriented specialties.

## METHOD

### Sample

The sample consisted of 200 students enrolled in a medical program, in their third or fourth year. Table 1 shows demographic information across the three campuses. The participants were at

least 21-years of age, a resident of Puerto Rico for at least the last three years, able to read and understand English and Spanish and had a minimum of a Bachelor's Degree. In terms of specialty interest, 118 were "undecided", 72 reported interest in "people-oriented" specialties and 10 were in pursuit of "technology-oriented" specialties. The difference between the "people-oriented" and the "technology-oriented" specialty areas depends on the amount of time and interaction that is required of them to have with patients. It is most likely that a family doctor, for example, might spend more time with a patient than a surgeon or a radiologist that might have brief and isolated casual interaction. Medical specialty focus is shown in Table 2, based on previous literature.<sup>22</sup>

### Procedures

The research proposal was submitted to Institutional Review Board (IRB) at Carlos Albizu University and to the other participating Universities. Upon fulfilling the board's requirements and receiving approval, permission was granted by the Dean of Students, who provided an endorsement letter that allowed access to the students. A convenience sample of medical students was obtained from three medical Schools in Puerto Rico. Contact information was obtained through the university they attended. Each participant was informed of the voluntary nature of the study and the non-binding nature of his or her agreement to participate.

Each participant was personally visited at their Medical School Campus. The approach was made through some of the professors who opened the space after class for the administration of the survey to those students that were interested. Each participant was provided a thorough explanation regarding the purpose and the content of the survey. This information was transmitted orally that, reflected the content of the informed consent that they signed. It was explained to the participants that the purpose of the study was to explore the levels of empathy, arrogance and social desirability among medical students in their third and fourth year, and examine if there was any relationship among the variables. Participants were informed of the confidentiality regarding their participation, and were provided a window of ten minutes for asking questions about the study. To ensure confidentiality, each survey formed a "packet" and was distributed in a designated and appropriately labeled envelope. Once finished, participants stored their completed surveys inside envelopes. In a separate folder, signed consent forms were collected. Students completed the survey in their respective classrooms. The total time to complete the survey was about 20-minutes. All of the instruments and forms were in Spanish.

### Instruments

**The Jefferson Scale of Empathy (JSE-S),<sup>23</sup> Spanish Version:** The JSE-S is a self-administered questionnaire, that aims to measure empathy among medical students. The original scale consists of 20 items, that measure empathy. Each item is rated in a 7-point Likert scale, 1=Strongly disagree, 7=Strongly agree. Half the items are reverse scored (1=Strongly agree, 7=Strongly disagree): Higher scores, imply higher empathy. In different versions of the

**Table 1. Sociodemographic Characteristics of Medical Students Sample (N=200)**

Characteristics	n	University of Puerto Rico n (percent)	Universidad Central del Caribe n (percent)	San Juan Bautista n (percent)
<b>Gender</b>				
Female	111	41 (20.5%)	25 (12.5%)	45 (22.5%)
Male	89	31 (15.5%)	18 (9.0%)	40 (20.0%)
<b>Year</b>				
3 <sup>rd</sup>	91	42 (21%)	17 (8.5%)	32 (16.0%)
4 <sup>th</sup>	109	30 (15.0%)	26 (13.0%)	53 (26.5%)
<b>Age Group</b>				
21-25	109	51 (25.5%)	13 (6.5%)	45 (22.5%)
26-30	86	20 (10.0%)	29 (14.5%)	37 (18.5%)
31-35	2	0 (0%)	1 (0.5%)	1 (0.5%)
36-40	3	1 (0.5%)	0 (0%)	2 (1.0%)
<b>Income (\$)</b>				
0-5,000	156	49 (24.5%)	34 (17.0%)	73 (36.5%)
5,001-10,000	4	3 (1.5%)	0 (0%)	1 (0.5%)
10,001-20,000	9	4 (2.0%)	1 (0.5%)	4 (2.0%)
20,001-30,000	7	4 (2.0%)	2 (1.0%)	1 (0.5%)
30,001-40,000	3	3 (1.5%)	0 (0%)	0 (0%)
40,001-50,000	12	5 (2.5%)	3 (1.5%)	4 (2.0%)
50,001-60,000	2	0 (0%)	2 (1.0%)	0 (0%)
60,001+	7	4 (2.0%)	1 (0.5%)	2 (1.0%)
<b>Religion</b>				
Catholic	94	31 (15.5%)	23 (11.5%)	40 (20.0%)
Protestant/Evangelic	39	14 (7.0%)	6 (3.0%)	19 (9.5%)
Agnostic	17	10 (5.0%)	1 (0.5%)	6 (3.0%)
Atheist	19	8 (4.0%)	8 (4.0%)	3 (1.5%)
Other	31	9 (4.5%)	5 (2.5%)	17 (8.5%)

**Table 2. Medical Specialty Focus**

Specialty Focus	Specialty Focus			Total
	Undecided	"People-Oriented"	"Technology-Oriented"	
Specialty Focus	118	0	0	118
Cardiology	0	2	0	2
Dermatology	0	2	0	2
Emergency	0	4	0	4
Family	0	8	0	8
General	0	5	0	5
Internal	0	20	0	20
Neurology	0	0	4	4
OB/GYN	0	5	0	5
Orthopedics	0	5	0	5
Pathology	0	0	2	2
Pediatrics	0	7	0	7
Peds Cardio	0	2	0	2
Psychiatry	0	9	0	9
Radiology	0	0	2	2
Surgery	0	0	1	1
Trauma	0	0	1	1
Urology	0	3	0	3
Total	118	72	10	200

scale, three underlying factors have been identified (perspective taking, compassionate care and standing/walking in the patients' shoes).<sup>15,23,24</sup> An example of an item is, 'My patients feel better when I understand their feelings'. Internal consistency has varied between  $\alpha=0.76$  and  $\alpha=0.89$ . The estimated time for administration of this measure is between five to ten minutes.

In the current sample Cronbach's Alpha was computed with each item deleted to examine the item quality. Nine total items were deleted and resulted in the scale having a Cronbach's  $\alpha$  of 0.795, which implies good internal consistency reliability.<sup>25</sup> To explore the factorial structure of JSE-S in the medical student sample, all eleven items of the instrument were subjected to an exploratory analysis with orthogonal rotation (Varimax). The Kaiser-Meyer-Olkin (KMO) measure verified the sampling adequacy for the analysis, KMO=0.815. Barlett's test of sphericity  $\chi^2(5)=529.960$ , ( $p<0.001$ ), indicated that correlation structure is adequate for factor analyses. A principal component analysis (PCA) was used to assess the dimensionality of the data of the modified JSE-S. The principal components factor analysis with a cut-off point of 0.30 and the Kaiser's criterion of eigenvalues greater than 1,<sup>26</sup> yielded a three-factor solution as the best fit for the data (Table 3), the first component explained 37.81% of the variance and all three factors account for 58.40% of the total variance (Table 4). These factors were comparable to previous studies, and was considered as evidence of the modified scale's validity for the current sample. The factors were not used as separate subscales.

**The arrogance scale<sup>16</sup>:** This scale has been developed to measure arrogance among Puerto Rican adults. It consists of 9 items in Likert Format (0=Strongly disagree, 3=Strongly agree). The total scoring varied from 0 as minimum to 27 as a maximum scoring, where higher scoring indicate, attitudes of overvaluation of the ego or arrogance (e.g. 'I feel superior to other people'). For this sample the internal consistency indicated good reliability,  $\alpha=0.70$ . The scale was administered in its original form in Spanish. Administration time for this measure was around five minutes.

**The socially desirable response set measure (SDRS-5)<sup>27</sup>:** This is a self-report scale with five items. Respondents rank each item on a 5-point scale (0=Definitely True, 4=Definitely False). Because only the most extreme response is considered indicative of socially desirable responding, the responses are dichotomized in scoring of each item. This minimizes incorrect classifications of borderline responses as socially desirable. Higher score reflect more socially desirable responses (e.g. 'There have been occasions in which I have taken advantage of someone'). The scale was translated into Spanish taking into consideration the Puerto Rican culture. The internal consistency indicated good reliability  $\alpha=0.69$ . The administration time for this measure was approximately three-minutes.

**Sociodemographic questions:** Information was collected about gender, age, academic preparation, current year of study, specialty, income and university attended. Administration of this section of the survey was less than five minutes. The entire survey was administered in Spanish.

**Table 3. Rotated Component Matrix**

Rotated Component Matrix	Component		
	1	2	3
1. My understanding of how my patients and their families feel is a relevant factor in medical treatment	0.614	0.406	
2. My patients feel better when I understand their feelings	0.804		
3. I consider understanding my patients' body language as important as verbal communication in caregiver-patient relationships		0.812	
4. I try to imagine myself in my patients' shoes when providing care to them		0.618	0.447
5. My understanding of my patients' feelings gives them a sense of validation that is therapeutic in its own right	0.658		0.380
6. Patients' illnesses can only be cured by medical treatment; therefore, affection ties to my patients cannot have a significant place in this endeavor		0.392	0.337
7. I try to understand what is going on in my patients' mind by paying attention to their nonverbal cues and body language		0.642	0.398
8. Empathy is a therapeutic skill without which my success as a health care provider would be limited			0.675
9. An important component of the relationship with my patients is my understanding of the emotional status of themselves and their families	0.400		0.506
10. I try to think like my patients in order to render better care			0.663
11. I believe that empathy is an important therapeutic factor in medical treatment)	0.667		0.309

Extraction Method: Principal Component Analysis.  
Rotation Method: Varimax with Kaiser Normalization.  
a. Rotation converged in 5 iterations.

**Table 4. Principal Component Factor Analysis**

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.781	37.812	37.812	3.781	37.812	37.812	2.216	22.163	22.163
2	1.041	10.410	48.222	1.041	10.410	48.222	2.180	21.803	43.966
3	1.018	10.185	58.407	1.018	10.185	58.407	1.444	14.441	58.407
4	0.809	8.086	66.493						
5	0.783	7.826	74.319						
6	0.724	7.239	81.558						
7	0.555	5.546	87.103						
8	0.496	4.957	92.060						
9	0.462	4.622	96.682						
10	0.332	3.318	100.000						

Extraction Method: Principal Component Analysis.

## RESULTS

### Hypothesis 1: Empathy and Arrogance will be Inversely Correlated

We conducted a Bivariate Correlation Analysis between the individual items of the JSE-S and the AS, as well as the total scores. The results of individual item correlations yielded 12 statistically significant inverse correlations lower or equal to  $r(198) = -0.18$ , ( $p < 0.05$ , two-tailed). Also, there were 14 statistically significant inverse correlations higher than  $-0.18$  or equal to  $r(198) = -0.29$  ( $p < 0.01$ , two-tailed).

The three factors of the JSE-S were not used as separate scores. The correlation of the total scores was  $r(198) = -0.175$ ,  $p = 0.013$ , ( $p < 0.05$ , two-tailed), indicating a low but statistically significant inverse correlation between empathy and arrogance scores, supporting the hypothesis. The analysis of the correlations between individual items across the two scales helped dig a little deeper to find out what specific aspects of each variable were related, further exploring the hypothesis. These correlations are elaborated on in the discussion.

### Hypothesis 2: Social Desirability will Moderate the Relationship between Empathy and Arrogance

We examined Social Desirability (M) as a moderator between Empathy (X) and Arrogance (Y). Using PROCESS software in statistical package for the social sciences (SPSS), we conducted a moderation analysis. The interaction between empathy and social desirability was not statistically significant ( $b = 0.912$ ,  $SE = 0.918$ ,  $p > 0.05$ ). However, there was a significant negative correlation between empathy and social desirability,  $r = -0.36$ ,  $p < 0.01$ . Moreover, Social Desirability was not a statistically significant moderator between empathy and arrogance,  $\Delta R^2 = 0.004$ ,  $F(1,196) = 0.985$ , ( $p = 0.322$ ). A closer inspection of standard deviations showed that

when Empathy goes up by 1 standard deviation, Arrogance goes down by  $-0.473$  standard deviations reflecting their inverse relationship. Also, when the interaction of both empathy and social desirability (goes up? Down? Specify), Arrogance goes up by  $0.912$  standard deviations. When social desirability goes up by 1 standard deviation, arrogance goes down by  $-1.18$ .

### Hypothesis 3: Females will Score Higher on Empathy than Males

We performed a univariate analysis of variance (ANOVA) to compare the effect of gender on empathy scores among medical students. Empathy mean scores for 111 female students ( $M = 72.96$ ,  $SD = 4.83$ ) was higher than 89 male students ( $M = 70.22$ ,  $SD = 6.35$ ). The Levene's  $F$  test revealed that the homogeneity of variance assumption was not met ( $p = 0.007$ ). As such, the Welch's  $F$  test was used. An Alpha level of  $0.05$  was used for all subsequent analyses. Welch's  $F(1,160.922) = 11.32$ , ( $p < 0.05$ ), 95% CI [70.94-72.74] reveals that there is a statistically significant difference between female and male students' empathy scores. This supports the hypothesis that female students score higher on empathy than male students. Further, Cohen's  $d$  effect size value was  $d = 0.48$  suggesting a medium practical significance.

### Hypothesis 4: Males will Score Higher on Arrogance than Females

We compared the effect of gender on arrogance scores among medical students using ANOVA. Results show that there is no statistically significant difference between female and male student's arrogance scores.  $F(1,198) = 0.905$ ,  $p = 0.342$ , ( $p < 0.05$  level), 95% CI [3.07-4.05]. Further, Cohen's  $d$  effect size value was  $d = 0.130$ , considered to be a relatively small effect size.

### Hypothesis 5: Technology-oriented Specialties will Score Higher on Arrogance Compared to People-oriented Specialties

We performed an ANOVA analysis to compare the effect of spe-

cialty focus on arrogance scores among medical students. The Levene's  $F$  test revealed that the homogeneity of variance assumption was not met ( $p=0.012$ ). Therefore, the Welch's  $F$  test was used. Welch's  $F$  (2,33.98)=3.62, ( $p<0.05$ ), 95% CI [3.07-4.05] reveal that there is a statistically significant difference between specialties on arrogance scores reported. Further, Cohen's  $d$  effect size value was  $d=0.52$ , considered to be a medium effect size. Post-hoc comparisons using Games-Howell test indicated that the mean score for the "Technology-Oriented" specialty ( $M=2.10$ ,  $SD=1.59$ ) was significantly higher than the "Undecided" specialty group ( $M=3.66$ ,  $SD=3.88$ ). However, the "people-oriented" specialty group ( $M=3.61$ ,  $SD=3.12$ ) did not differ significantly from the "Undecided" or "Technology-Oriented" specialty groups. Therefore, this hypothesis remains unsupported.

#### Hypothesis 6: People-oriented Specialties will Score Higher on Empathy Compared to Technology-oriented Specialties

Using ANOVA analysis we compared the effect of specialty on empathy scores among medical students. Results indicate that there is no statistically significant difference between the specialties on empathy scores  $F$  (2, 197)=0.116,  $p=0.891$  ( $p<0.05$  level), 95% CI [70.94-72.54]. Therefore, this hypothesis remains unsupported.

#### ADDITIONAL EXPLORATORY ANALYSES

We performed posterior ANOVA analyses on the following:

1. We compared the effect of year of academic study (third or fourth year) on empathy scores among medical students. Results indicate that there is no statistically significant difference between third- and fourth-year students on empathy scores  $F$  (1,198)=0.811,  $p=0.369$  ( $p<0.05$  level), 95% CI [70.94-72.54]. Further, Cohen's  $d$  effect size value ( $d=0.13$ ), considered to be a relatively small effect size.
2. We compared the effect of religion on empathy scores among medical students. The results indicate that there is no statistically significant difference among different religious affiliations and empathy scores  $F$  (4, 195)=2.034,  $p=0.091$  ( $p<0.05$  level), 95% CI [70.94-72.54].
3. We compared the effect of academic year of study (third or fourth year) on arrogance scores among medical students. Results indicate that there is no statistically significant difference between third- and fourth-year students (Report the mean scores and SDs here in paranthesis) on arrogance scores  $F$  (1,198)=0.147,  $p=0.702$  ( $p<0.05$  level), 95% CI [3.07-4.05]. Further, Cohen's  $d$  effect size value ( $d=0.05$ ), considered to be a relatively small effect size.
4. We compared the effect of religious affiliation on arrogance scores among medical students. Results  $F$  (4,58.34)=2.34,  $p=0.024$  ( $p<0.05$  level), 95% CI [3.07-4.05], show that there is statistically significant difference among different religious affiliations, on arrogance scores. Further, Cohen's effect size value ( $d=0.83$ ), considered to be a large effect size. Post-hoc comparisons using Tukey honestly significant difference (HSD) test indicated that the major statistical differences were found between those identified as "Atheist" ( $M=6.05$ ,  $SD=5.04$ ) who reported

higher mean scores than those that identified as "Protestant/Evangelical" ( $M=2.61$ ,  $SD=2.93$ ),  $p=0.004$ ,  $p<0.05$ . There was also a significant differences found between "Atheists" ( $M=6.05$ ,  $SD=5.04$ ) and "Catholics" ( $M=3.20$ ,  $SD=2.96$ ),  $p=0.011$ ,  $p<0.05$ , "atheists" scoring higher.

#### DISCUSSION

This study's results were from a battery of administered scales (Jefferson Scale of Empathy-Spanish Version, Arrogance Scale and Social Desirability Scale) with the following objectives: first, to validate the JSE-S; second, to examine if there is a relationship between empathy and arrogance; and third, identify social desirability as a moderator between empathy and arrogance and evaluate if the value of the moderator influences the relationship between empathy and arrogance. Also examined were the relationships of sociodemographic variables to arrogance and empathy in the medical student population.

First, the results obtained from the JSE-S contains 11 items, three factors and a reliability coefficient of 0.795, which suggest a reliable instrument for measuring the construct of empathy among medical students in Puerto Rico. This is consistent with results found by others in the literature<sup>23,28,29</sup> among the Hispanic and Spanish speaking population using JSE-S. In comparison to the literature, the 11 items within these 3 factors all belong to the first two original factors on Perspective Taking and Compassionate Care.<sup>24</sup> The third factor was a trivial factor, or a residual factor, because it contains less than three items,<sup>28,30</sup> although it doesn't seem to alter the overall components of the scale. Overall, the factor analysis confirms "cognitive" and "emotional" as the two main aspects of the empathic processes.<sup>31</sup> While the factors were identified, only the total scores were used in the analysis. Factor analysis helped validate the Spanish/student modified version. This version of the scale would ultimately, represent a shorter and concise measure of empathy which means that this scale could be used as an alternative measure of empathy in the medical student population in Puerto Rico and othre Spanish speaking cultures.

The relationships found between items across, the JSE-S and the AS scales, support our proposed hypothesis of finding significant inverse correlations. For example, item 2 ("My patients feel better when I understand their feelings?") from JSE-S correlated significantly with most items on the AS scale, which would suggest that for empathy to be effective it must be perceived by the patient.<sup>15</sup> Ultimately, this would be the opposite of an 'arrogant physician' who dismisses his patient's input and is perceived as insensitive<sup>3</sup> which has proven to not promote a solid doctor-patient relationship.

Other items from JSE-S with inverse correlations with AS include: item 9, 'An important component of the relationship with my patients is my understanding of the emotional status of themselves and their families', item 5, 'My understanding of my patients' feelings gives them a sense of validation that is therapeutic in its own right' and item 7, I try to understand what is going on in my patients' mind by paying attention to their non-verbal cues

and body language'. This confirms that one of the most important components in the doctor-patient relationship is the level of understanding the physician has of the patient's inner workings, which can occur when the physician pays attention to the emotional state of the patient and communicates a form of validation. What also makes for a more comprehensive professional is to be able to pay attention to the nonverbal or body language that also emits further information about what the patient is experiencing.<sup>3,15,32</sup>

As mentioned above, these specific and significant inverse correlations confirm that by keeping these items, we have more confidence that the instrument measures the construct of empathy that is differentiated from an arrogant mindset. The majority of the AS items emphasize on the individualistic aspects of the self in a way that does not require understanding of emotional connections with others, or promote closeness, which is the opposite of what we are striving for in the doctor-patient relationship. The disposition of arrogance highlights potentially negative and undesirable social consequences in interpersonal communication.<sup>17</sup>

Moreover, social desirability was included as a moderator variable and it has been identified as a key component of impression management.<sup>33</sup> Results support that the variable is not statistically significant as a moderator between empathy and arrogance. So, when the students report high social desirability (+1 SD), without considering empathy scores, the arrogance levels tend to decrease (-1.18 SD). In other words, a person that aims to be socially desirable or "liked" might reduce arrogance. However, when both empathy and social desirability interact, or are present, they tend to increase slightly the appearance or display of arrogance (0.91 SD).

Ultimately, this could suggest that by means of displaying good impression management, empathy and arrogance may co-exist, "*narcissistic individuals may have intact empathic ability, but choose to disengage from others' pain or distress, while others may have a deficient ability in the recognition of others' feelings*".<sup>31</sup> It is possible that multiple relationships could exist between these constructs, given their complexity.<sup>31</sup> Further studies would need to be conducted to assess this in detail, since arrogance is merely a trait examined under the umbrella of the narcissistic personality. On the other hand, empathy and social desirability appear to have a negative correlation; more empathic disposition seems to be associated with less need to look exceptionally good. Another result suggested that the higher the empathy score, the less tendency to be arrogant, which is consistent with previous research.

In terms of sociodemographic findings, the sample was predominantly female, half of the students were between the ages of 21-25 and reported an annual income of up to \$5,000. In our analyses, females did report higher mean scores for empathy than males, which is consistent with the hypothesis established in this study and with previous studies.<sup>2,11-13</sup> However, there were no differences found in reported arrogance mean scores between female and male medical students. This is in contrast to the finding that Puerto Rican women in the general population tend to report higher levels of arrogance, in comparison to men.<sup>16</sup> These results suggest the need for further studies regarding the construct of arrogance in relationship to gender.

In addition to this, there was no statistical difference on empathy and arrogance scores between third- and fourth-year students, contrary to the literature which suggests that there is a tendency for empathy scores to erode over time, as students go through medical school.<sup>2,34,35</sup> It is possible that such erosion could be due to the lack of emphasis on empathy in the educational curriculum, the general atmosphere of the learning environment, lack of positive role models or student's negative experiences during medical school.<sup>24</sup> However, in the present study, it is likely that the specific time frame and learning environment during and after the passing of Hurricane María, might have sustained and enhanced empathy, along with having a good educational program and positive role models, which ultimately, is what we aim to raise awareness on with this study.

Another analysis found an unusually high number of "Undecided" students (about 59%) on choosing a specialty area ("people-oriented" versus "technology-oriented"). It is possible that because of small sample sizes, no statistical differences were found among the specialty areas on empathy scores. These findings do not seem consistent with what has been reported in the literature and with our original hypothesis, that those who practice in "people-oriented" specialties like general medicine, pediatrics, internal medicine and family medicine, would score higher on empathy than "technology-oriented" specialties like surgery or radiology.<sup>22,36</sup>

High degree of uncertainty in choosing a specialization among large number of medical students may be due to a number of factors such as level of competitiveness among specialties, or that some specialties require more years of study, thus, excess work, with possible repercussions like financial problems due to higher student loans.<sup>2,37</sup> Also, considering more than one area of specialty, coupled with the time it takes to finish a medical career, may lead to, a high degree of uncertainty. However, it should be noted that those interested in a "technology-oriented" specialty areas, tended to score higher in arrogance than the "Undecided" students in this sample. This is somewhat consistent with the literature that surgeons tend to score high on narcissism.<sup>38</sup>

Moreover, it was interesting to find differences among religious affiliation on arrogance scores reported by medical students. Those who identified as "Atheist" scored higher on arrogance than those who reported "Protestant/Evangelical" affiliations. There were also some differences found with "Atheist" scoring higher in arrogance than those who report "Catholic" affiliation. These results suggest that not adhering to a particular Christian-based belief might lead to some degree of arrogance. Interestingly, there were no significant difference found among the mean empathy scores across the religious and non-religious categories (e.g. Catholic, Protestant/Evangelical, Agnostic, Atheist and Other). This could suggest that holding or not holding a religious belief, is not an influencing factor in showing degrees of empathy. However, the same may not be said for those that do not hold some type of religious belief when it comes to cultivating other personality traits, such as arrogance.

A similar finding on empathy (? , clarify) was reported

in general Puerto Rican samples where those who practiced Protestant Religious beliefs tended to score higher than those who identified as Catholics.<sup>16</sup> While the literature seems to suggest that Atheists tend to score higher on arrogance, in the Christian-Based beliefs, Protestants tend to show more arrogance than Catholics. Taking into account that Puerto Rico's historic religious foundation is mostly Catholic, as was also the case with half the students in this study, it appears that the faith traditions Puerto Ricans follow may have implications for the way they relate to the self and to others.

## GENERAL CONSIDERATIONS AND LIMITATIONS

There are certain considerations and limitations to this study. For example, certain medical institutions on the island did not participate. In future studies they should be included in order to generalize results across the four major medical universities in Puerto Rico, and to the medical student population. In addition, having a larger sample that represents both "people-oriented" specialties and "technology-oriented" ones may result in greater confidence in the findings with more reliable and generalizable results.

Self-reported data of the JSE-S limits some validity of the findings because of over or underestimating their own empathic practice. The negative correlation between social desirability and empathy would suggest a possible bias. The JSE-S assesses disposition from the medical student's point of view, and doesn't address the patient's perception of empathy, which is the other half of the relationship.<sup>39</sup> The correspondence between the physicians' and patients' perceptions would be helpful to study further since, according to the literature, patients tend to interpret empathy differently from the way physician would.<sup>40</sup>

## FUTURE STUDIES AND CONCLUSIONS

Future research for use the JSE-S, using both, the long version and the version proposed in this study in a randomized controlled trial (RCT) is suggested in order to evaluate their psychometric properties, including the factors it contains. If all four medical universities of Puerto Rico participated in this study, a large-scale research could be conducted to develop norm tables for Puerto Rico and cut-off scores for the JSE-S.

Another consideration would be to conduct longitudinal/cross-sectional studies using the JSE-S on students all the way through medical school, using the total score as well as the factor scores, so that the results would be more informative of the trajectory of empathy in a particular institution. Such studies might provide better insight regarding the importance of empathy, while promoting more interest to sustain and enhance it. Fostering empathy should be supported by a proper learning environment as well as by practitioners who serve as role models. Potentially, more entrenched empathic practice would result in greater satisfaction in the doctor-patient relationship, more successful treatments, and a more rounded educational outcome in the field.

Further variables that could be explored in the relationship to empathy could include burnout, workload, personal stress-

ors and other personality traits. Further studies could be conducted by examining the relationships of the patient's perception of the interaction with his or her medical provider as well as the medical provider's perception of his or her performance.

In conclusion, this study is relevant and important as it takes a closer look at future medical professionals in their prime formative years as medical students. Having a validated instrument that measures empathy among this population may help increase awareness of its importance in the medical profession as it promotes opportunities for further research in Puerto Rico. Also, it may encourage similar research by scholars and practitioners in other Hispanic Latin Countries.

Other constructs that were examined such as arrogance and social desirability allowed a closer look at how impression management may moderate the display of empathy behaviors and arrogant ones. Moreover, we should consider the possibility that both may coexist in a manner that suggest that social impression management is relevant in social interactions. Having knowledge of empathy and arrogance and their possible impact could propel not only the promotion of self-care and how one projects towards others, but a favorable cohesion in interpersonal work relationships. Creating the culture of self-care among those that take care of others, surely will reap rewards not only within the health care system, but among other human relationships.

Empathy is the foundation of the doctor-patient relationship, which ultimately shapes the calling of the well-rounded scholar and healthcare professional who serves his or her community and embodies what he or she represents. If training institutions attempt to intentionally cultivate empathy, humility and ethical behavior from the beginning of a student's medical, professional development it may begin to revolutionize health care back to its authentic roots of doing no harm and promoting justice.

## CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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