COMPASSIONATE CARE COMPONENT OF THE CONSTRUCT EMPATHY IN MEDICAL STUDENTS IN COLOMBIA AND DOMINICAN REPUBLIC

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ABSTRACT

Introduction: The development of empathy in medical students, which is essential for therapeutic effectiveness and improved patient outcomes, is not well understood. The objective of this study is to determine whether there are differences between levels of the “compassionate care” component of empathy among four medical schools in Colombia and the Dominican Republic.

Subjects and methods: The sample consisted of medical students. This exploratory and cross-section study measured empathy levels by using the Spanish version of the Jefferson Scale of Physicians. Levels of empathy were studied and compared by a three-factor analysis of variance, Tukey multiple comparison test and discriminant analysis of the matrix components.

Results: Differences in levels of empathy of the “compassionate care” component between universities, courses and gender were found.

Conclusions: Variability in the values of the levels of the “compassionate care” component of empathy were observed among the factors: university, course and gender. The observed variability between and within the university populations studied cannot be explained, which can be attributed to other unknown factors that influence empathy levels.

Keywords: Empathy, Compassion, Medical Schools, Colombia, Dominican Republic.

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Introduction

The presence of empathy in physicians can increase understanding, doctor-patient relationship, and gratification that result in better patient care. Therefore, developing this attribute in medical students should be of particular concern in medical schools. The results of measuring levels of empathy levels in these students have been mixed: in some cases declined and in others increased. This also is true with other health care providers. Empathy presents variability in studied factors: “classes” and “gender” and between and within “faculties” of different countries. There exist several scales for measuring empathy, but none of them is specific for medical education and patient...
care\(^{(21)}\). Hojat et al.\(^{(22)}\) developed the Jefferson Scale of Physician Empathy (JSPE), which is specific for medical students (S version).

It is a multidimensional scale that consists of three components:

a) point of perspective;
b) compassionate care and c) ability to “step into the shoes of the patient” (b and c are specific components associated with the doctor-patient relationship)\(^{(21,22)}\).

Díaz et al.\(^{(19)}\) observed differences among students of medical schools within and between countries\(^{(23,24)}\) from the summations of the data for each item in each subject (levels of empathy) and matrices of data, including all items of the JSPE scale; however, the variability found could not be explained and it is possible that the comparison between each specific component of the construct of empathy among populations could be a source that guides the empirical explanation of the observed variability. The objective of this study is to compare the different results of the levels of empathy that Díaz et al.\(^{(19)}\) found that may depend among other factors, to differences between levels of the “compassionate care” component of empathy.

Materials and methods

This is an exploratory and cross-sectional\(^{(25)}\), governed bio-ethically by the rules of Helsinki Declaration (approved by the Ethics Committee of Research (CEI) of the University of Development and German Clinic, approval code CAS-UDD: 2011-64). The study population was composed of students from the first through fifth year (courses) of the medical career of the Universidad del Norte, Universidad Libre and Universidad de San Martin, located in Barranquilla (Colombia)\(^{(7,8)}\) and Central de Este (UCE) of San Pedro de Macoris (Dominican Republic)\(^{(9)}\). Participants from each of the groups were applied the Spanish version of the JSPE, S version, validated in Mexico\(^{(26)}\), and culturally adapted in Colombia and Dominican Republic by criterion experts\(^{(7-9)}\). The psychometric properties of the scale have been described in previous publications\(^{(20-26)}\) and highlighted, among others to having a Cronbach \(\alpha\) between 0.8 and 0.9, stability, as well as divergent and convergent validity, and the existence of no cutoff\(^{(26)}\). Of the original matrix of empathy the data items chosen were related to 1, 7, 8, 11, 12, 14 and 19 of the JSPE scale, which measure the “compassionate care” component\(^{(19,26)}\), with a maximum total of 49 points.

**Statistic analysis**

The totals of the levels of empathy (sum of the observed values of the questions associated with “compassionate care” component obtained from each subject) was studied for the same factors and were subject to the same statistical tests described in a previous work\(^{(19)}\). Data were analyzed using the Statistical Package for the Social Sciences “SPSS” 20.0 statistical program ©. The level of significance was set \(\alpha \leq 0.05\) and \(\beta \leq 0.20\) in all cases.

**Results**

The results presented in Table 1 are of the descriptive statistics variable for empathic orientation of the “compassionate care” component of empathy construct in each of the Universities (Faculties), Courses (Years) and Gender.

<table>
<thead>
<tr>
<th>Factors</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Typical Error</th>
<th>Confidence interval for the mean 95% Lower</th>
<th>Upper</th>
<th>Minimum</th>
<th>Maximum</th>
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</thead>
<tbody>
<tr>
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<tr>
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<td>32.15</td>
<td>33.30</td>
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<td>43</td>
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<td>34.52</td>
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<td>0.299</td>
<td>33.64</td>
<td>35.64</td>
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<td>36.02</td>
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<tr>
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<td>6.285</td>
<td>1.267</td>
<td>31.86</td>
<td>37.42</td>
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<tr>
<td>Total</td>
<td>2358</td>
<td>34.64</td>
<td>6.955</td>
<td>0.299</td>
<td>33.64</td>
<td>35.64</td>
<td>7</td>
<td>49</td>
</tr>
<tr>
<td>Gender</td>
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<td>33.20</td>
<td>6.592</td>
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<td>32.47</td>
<td>33.92</td>
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<td>34.13</td>
<td>35.81</td>
<td>15</td>
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</tbody>
</table>

Table 1: Results of the estimation of mean and standard deviation of the sums are observed in empathic orientation for the “compassionate care” component of empathy construct in each of the Universities (Faculties), Courses (Years) and Gender.

**UCE (DR): Faculty of Medicine of the University Central del Este (Dominican Republic); UNINORTE (Col.): Faculty of Medicine of the Universidad del Norte, Barranquilla, Colombia; ULibre (Col.): Faculty of Medicine of the Universidad Libre, Barranquilla, Colombia; USM (Col.): Faculty of Medicine of the Fundación Universitaria San Martin, Barranquilla, Colombia. 1: First year; 2: Second year; 3: Third year; 4: Fourth year; 5: Fifth year. F: Feminine Gender; M: Masculine Gender.
The results of the factorial ANOVA showed significant differences between the levels of each factor considered: University, Course and Gender ($F = 35.487$, $p<0.0001$; $F = 3.673$, $p<0.005$; $F = 15.15$, $p<0.0001$ respectively). The $R^2$ value was 0.079 (7.9%), which shows that there is variability not explained by the model (92.1%). The values of $eta$-squared ($\eta^2$) were 0.005; 0.008 and 0.008 and a power of 1.0; 0.883 and 0.973 respectively, showing that the differences between the levels of the factors studied, although exist, are small and sizes are sufficient to make inferences about the populations being studied in regards to the variables examined.

The results of the multiple comparison of means for each level of empathy for each component studied per faculty (University) (Table 2) observed that three groups were formed; the first, consisting of the mean of the Faculty of Medicine at UCE, the lowest of all; followed by the mean of the Faculty of Medicine at USM and, between them, there are significant differences ($p <0.05$); lastly, followed by the means of the Faculties of Medicine at Uninorte and ULibre, which have the highest values for the levels of empathy and, between them, there are no significant differences ($p>0.05$).

<table>
<thead>
<tr>
<th>University (Faculty)</th>
<th>N</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
</table>
| UCE (DR)             | 515| 32.72| | | |1.00
| USM (Col.)           | 283| 33.94| | | |1.00
| ULibre (Col.)        | 695| 27.68| | | |1.00
| UNINORTE (Col.)      | 345| 31.72| | | |1.00

Table 2: Results of the comparison of means of universities for the “compassionate care” component per faculty (University). UCE (DR): Faculty of Medicine of the Universidad Central del Este (Dominican Republic); UNINORTE (Col.): Faculty of Medicine of the Universidad del Norte, Barranquilla, Colombia; ULibre (Col.): Faculty of Medicine of the Universidad Libre, Barranquilla, Colombia.

The results of multiple comparison of means for the courses of all universities (Table 3) observed, in general, that the majority of courses from UCE have less values for the variable of empathic orientation and, of the contrary, higher mean values are concentrated in courses of Uninorte; the mean values of Universities, Libre and San Martin are between the extremes mentioned above although with some exceptions. However, the most general finding is the variability observed of the medians of courses between different universities.

<table>
<thead>
<tr>
<th>Course</th>
<th>N</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
</table>
| 1 UCE  | 151| 31.25| | | |1.00
| 2 UCE  | 108| 32.28| | | |1.00
| 3 UCE  | 97 | 32.72| | | |1.00
| 4 UCE  | 34 | 32.88| | | |1.00
| 5 UCE  | 53 | 33.40| | | |1.00
| 6 UCE  | 15 | 32.44| | | |1.00
| 1 USM  | 59 | 33.71| | | |1.00
| 2 USM  | 109| 33.94| | | |1.00
| 3 USM  | 112| 34.59| | | |1.00
| 4 USM  | 55 | 34.64| | | |1.00
| 5 USM  | 73 | 35.28| | | |1.00
| 6 USM  | 97 | 35.62| | | |1.00
| 1 ULibre| 128| 37.42| | | |1.00
| 2 ULibre| 93 | 38.54| | | |1.00
| 3 ULibre| 41 | 38.39| | | |1.00
| 4 ULibre| 102| 39.15| | | |1.00
| 5 ULibre| 221| 39.23| | | |1.00
| 6 ULibre| 290| 40.39| | | |1.00
| Sig    |    | 0.05| | | |1.00

Table 3: Results of the comparison between the means of the “compassionate care” component in each of the Universities (Faculties) and Courses (Years). UCE (DR): Faculty of Medicine of the Universidad Central del Este (Dominican Republic); UNINORTE (Col.): Faculty of Medicine of the Universidad del Norte, Barranquilla, Colombia; ULibre (Col.): Faculty of Medicine of the Universidad Libre, Barranquilla, Colombia; USM (Col.): Faculty of Medicine of the Universidad del Norte, Barranquilla, Colombia; 1: First year; 2: Second year; 3: Third year; 4: Fourth year; 5: Fifth year.

Finally, the results of the comparison of means between genders of different faculties studied (Table 4) shows that four distinct groups are formed, in ascending fashion in relation with values of empathic orientation and significant differences ($p <0.05$) between them. The first consists of both genders belonging to UCE and are characterized for having the lowest values of empathic orientation; the second group consists of the male medians of USM, Uninorte and ULibre and women of USM; this group differed significantly ($p <0.05$) from the third group that consists of the female gender of Uninorte and this group, in turn, significantly different ($p <0.05$) from the fourth group essentially consisting of the female gender of ULibre.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
</table>
| M UCE  | 196| 31.87| | | |1.00
| F UCE  | 327| 31.28| | | |1.00
| M USM  | 152| 35.60| | | |1.00
| F USM  | 159| 35.60| | | |1.00
| M ULibre| 277| 36.01| | | |1.00
| F ULibre| 239| 36.71| | | |1.00
| Sig    | 0.05| 0.02| | | |1.00

Table 4: Results of the comparison between the means of the “compassionate care” component in each of the Universities (Faculties) and Gender. UCE (DR): Faculty of Medicine of the Universidad Central del Este (Dominican Republic); UNINORTE (Col.): Faculty of Medicine of the Universidad del Norte, Barranquilla, Colombia; ULibre (Col.): Faculty of Medicine of the Universidad Libre, Barranquilla, Colombia; USM (Col.): Faculty of Medicine of the Universidad del Norte, Barranquilla, Colombia. F: Feminine Gender; M: Masculine Gender.
The results of applied discriminant test from matrices of the observed data are shown in Table 5. In all cases the Box’s M test was significant (p < 0.0005), indicating that the covariance matrices compared differ, and can be interpreted that the existence of, at least, one of the populations analyzed is different from the other.

![Table 5: Results of the application of the Box M test to determine differences between matrices of the Universities (Faculties), Courses (Years) and Gender.](image)

Moreover, the Wilks λ test (used to compare the means of the questions between the levels of each factor) was significant (p < 0.005) in all cases, indicating that all questions provide variability for differences between matrix levels of the factors studied, but do not explain all the variability. The model used correctly classifies 56.5% in comparisons between universities, 24.8% in courses (considering the faculties of origin) and 35.5% between genders of the faculties studied, all of which show that the three factors studied are sources of variability, but there is unexplained variability due to the existence of factors affecting levels of empathy that are unknown.

The Wilks’ Lambda values observed, in the comparison between universities, were significant (p < 0.0005) (λ = 0.503 and λ = 0.974; χ² = 1259.6 and χ² = 47.61) when functions 1-2, 2-3 and 3 were contrasted, except for the function 3 (p = 0.051, λ = 0.994; χ² = 10.79); all of which shows that the unexplained variance between the matrices is higher than the explained variance within such matrices, except the result of function 3 which assumes that the explained variance is relatively higher than the unexplained, which may be interpreted that two universities behave similarly with respect to the component studied. Something similar happens with the comparison between the courses of each of the universities. The values of Wilks λ, observed were significant (p < 0.0005) (λ = 0.434; λ = 0.86, λ = 0.903 and λ = 0.943; χ² = 1520.3; χ² = 274.3; χ² = 185.7 and χ² = 106.5) as functions 1-7 are compared to 4-7 respectively, except functions 5-7, 6-7 and 7, which were not significant (p> 0.05).

In the first case, it demonstrated the existence of an unexplained variance and this is greater than the unexplained between matrices compared, but in the second case, it showed the contrary, which can be interpreted that there are courses that behave similarly in relation to the variable studied. The comparison between genders, also considering the university factor, allowed to estimate the values of Wilks λ and these were significant (p < 0.005) (λ = 0.487, λ = 0.95 and λ = 0.947; χ² = 1316.5; χ² = 93.1 and χ² = 48.2) in contrast to the discriminant functions 1-7 to 3-7 respectively. The rest of the contrasts were not significant (p> 0.05).

**Discussion**

The results of empathy levels observed in the comparison of means of this indicator, of the resulting values of matrices for the corresponding scale of the “compassionate care” component and comparing these statistics among medical schools, allow the following generalizations:

a) there are differences and similarities between medical schools, including courses and gender in the compared countries, all of which is an empirical element that supports the studies that have observed variability in levels of empathy within and between populations of students

b) the variance explained could be the expression of factors that are unknown and were not measured in this study and influencing empathy, all of which supports the concept that empathy is a construct that depends on intrinsic and extrinsic factors (especially in the studied component) and therefore, the estimated levels are the result of complex processes;

c) the results, in this paper, regarding the comparison between the matrices are consistent with the results found in other studies that also show a tendency of variability.

These studies, involving students of Medicine and Dentistry in Latin America show differences, similarities or even contradictions between them. Something similar happens in other contexts and between countries. These results, require studies that deepen the search for predictors that could discover the “hidden factors” and measure the “suspects” or both and thus explain the variability found (explained and unexplained).

This variability appears to be a rule when
“describing” the behavior of levels of empathy as a construct. Several investigations underline(18-20) the fact that the concept of empathy consists of dimensions and, such dimensions appear to depend at the same time, of many factors and are precisely those which modulate or interact on the anatoneuropsychological processes involved in the expression of empathy and, therefore, help to explain the measured levels of empathy and self-empathy construct values. It is therefore possible to induce what is actually measured with the applied scale, is the result of a complex process and, moreover, is constructed evolutionary and ontogenetic(30) (possibly from fetal development to maturity of a subject).

In relation to the “compassionate care” component of empathy, Galán et al.(17) suggest that interaction with suffering could lead the student to a “personal adjustment”, which could lead to compassion fatigue and professional negligence (activities related to the clinical area in the process of formation) and that this could be the explanation for the results observed in studies in which empathy levels decline over time(3-6). This explanation may not adequately explain all the phenomena of the decline of empathy and, in turn, the theoretical judgment does not explain those studies that have seen an increase(7-11).

Consequently, the assumption that “students show a decrease in empathy as they begin to relate to the pain and suffering of patients in a period of clinical practice, as a reaction to this experience, despite increasing age”, does not have the necessary support from the empirical evidence point of view, as well as methodological, all of which does not deny the possible explanation that decreased levels of empathy can be caused by the aforementioned factors, but these factors may be necessary conditions, but not sufficient to fully explain the decrease. A similar contradiction arises with empathy levels associated with gender(5-13).

From the standpoint of the behavioral sciences, Mercadillo et al.(31) indicate, compassion can be explained under the Theory of Moral Emotions, which refers to “a special kind of emotion, that we experience by observing the destruction of a moral value or social standard and encourages us to reestablish that negligence”; therefore, compassion “is felt when we look at a person or other living being whom is suffering, especially if that suffering is caused intentionally, and motivates us to try to alleviate the sufferer”(31).

On the other hand, empathy is associated with not only compassion, but also moral(32). The inclusion of an emotional component and moral, involved in compassion, can lead us to pose, according to Mercadillo et al.(33) and Guarino(34), that compassion may be regulated by our biological constitution and our culture. De Río(35) states that one of the virtues that should characterize the action of a doctor is that compassion is “a character trait, unifying psychological aspects, cultural, sociological, ethnic and intellectual that channels the cognitive aspect of healing and as embodied in the reality of a particular patient”. This view, is a devoid of reductionism, if we add the neurobiological basis among other factors, we can infer that empathy, in general, and its component “compassionate care”, is the synthesis of a highly complex process. In this regard, the development process of the anatome bases, neural and psychological of a subject (ontogenetic), and the way these are constructed and interact, are subjected to the action of factors that act dialectically to this process(39).

As a result of the complex action of these factors, the way to integrate the affective and cognitive components of empathy should be different among individuals, but also among populations, as these populations may have different patterns and economic conditions, cultural, moral, educational, among others; which, they can also influence the differentiated manner of the formation of compassion. An approach with these characteristics may explain, in general terms, the results of this work and allow methodologically target case studies where the points raised by Del Río(35), among others, also come together in a particular way.

On the other hand, links between cognition, language, family experience and empathy imply a connection between sensitivity to emotional signals and the development of social cognition(39,38), all of which clearly show that empathy is very close to social cognition and this is built on a complex dialectical relationship between the micro and macro system where it moves the individual(39).

If we add to what was said about this dialectical relationship, it also moves in time (evolutionarily), then a complex relationship emerges from this process as a network that is built from the “outside” and also from a self process (from one’s self); hence the “network” is nothing more than the expression of multiple external and internal factors that “determine”, in its interactive influence, a “final product”: the “degree” of compassion
achieved, as a component. Moreover, there is the interaction of compassion with the other components of empathy, all of which depend, in turn, to interaction of internal and external factors of which are subjected to each area in their particular environment (family) and social.

In accordance with the objective of this study, it was found that there are differences between the levels of empathy in reference to the "compassionate care" component among medical students of the four medical faculties studied. However, the differences and similarities found in the component examined cannot be further explained in this study and is pending its finding as scientific fact(25). This issue opens the door to the need for further research and to compare the differences found in different populations of university students in Latin America by other authors(19,37-39,40), which could begin to explain, among other things, differences in the "compassionate care" component.

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