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ORIGINAL ARTICLE

Empathy in Professors and Students of a School of Dentistry in the Caribbean

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ABSTRACT

Objective: To estimate and compare the levels of empathy between undergraduate dentistry students and professors at a university in the Dominican Republic. **Material and Methods:** Cross-sectional and descriptive study. The studied population consisted of two groups. The first: students of the Dentistry Career (N=520; n=335: 64.42% of total students) were distributed in two areas, basic-preclinical and clinical, while the second group corresponded of teachers who work in both areas (N=92; n=56; 60.87% of all teachers). The total sample was n = 391. The Jefferson Scale of Physician Empathy (S-Version) was used. Reliability was estimated using Cronbach's α and intraclass correlation coefficient, descriptive statistics, two-way analysis of variance, Tukey's test, effect size, and power of the test. Significance level: $\alpha \leq 0.05$ and $\beta \leq 0.20$. **Results:** The empathy and dimension values were, in general, higher in the professors of the clinical area in relation to the other areas studied, with the exception of the compassionate care dimension. **Conclusion:** The finding that clinical teachers have a greater value of empathy is potentially an advantage for training students, especially in the clinical area.

Keywords: Empathy; Students; Education, Dental.

Introduction

The concept of empathy has been considered an important factor in training dentistry students [1] and health sciences in general [2]. Professors constitute a model to be followed by their students, who can encourage the teaching-learning process and the formation of empathetic interactions with their patients [1,2] and, therefore, the result of the comparison between teachers and students should result in higher levels in the former so that the example of the model to be followed by the students can be carried out. Under these circumstances, it could be assumed that high degrees of empathy development in professors should lead to greater potential for understanding and a better grasp of internal and external conflicts for their students [2,3]. However, the conception of professors showing attitudes of indifference or no emotional contact, or both, with students and also with patients is out of touch with current teaching-learning and integral training processes for students in the health sciences [2,4].

The premise of solid empathy training for professors could be a factor contributing to increase the possibility of success in clinical activity by their students. In this case, the professor executes actions that end up presenting positive attitude models for their students and strengthening their educational process [4-10].

The foregoing ideas imply that empathy training for students must constitute an ongoing objective for universities and become manifest as an effective policy related to the incorporation of empathy into training of all Health Sciences careers [1,2,4-11]. In keeping with the above, the American Dental Education Association (ADEA) [12] has stated that empathy is the second essential clinical competency for all dentists. However, complexity of empathy as an attribute poses a problem [11,13,14], implying that the introduction of empathy into student training processes requires time and preparation and is the result of a planned strategy and dynamic action and is, in fact, influenced by several factors [6,15-22], among others, the example set by professors [2]. This difficulty is a common characteristic for all Health Science students [6,15-17,19-23]. In this context, the objective of this paper is to estimate empathy levels in students and professors from basic and preclinical areas, as well as from the clinical area of a Dentistry School in the Dominican Republic, and to compare the empathy behavior of students and professors.

Material and Methods

Study Design and Sampling

Descriptive cross-sectional study. Data were pooled during June 2019. A sample of n=391 participants was taken, including all students (n=335) and professors (n=56) who voluntarily agreed to answer the instrument. 60.87% of all professors and 64.42% of all students at the Dental Faculty of the Universidad Nacional Pedro Henríquez Ureña (UNPHU) in the Dominican Republic were studied. The causes for which it was not possible to evaluate 100% of students and teachers are varied: absence at the time of application, absence of time punctuality in relation to the application of the instrument and voluntarily deciding not to participate in the research. These causes were consistent with other studies conducted in Latin America [2,5,11,12,16,18,19].

Data Collection

Empathy was measured by means of the Jefferson Scale of Physician Empathy (JSE; version-S) (self-administered) [24] and was applied in Spanish. This instrument features stable reliability (0.72-0.89) and enables the measurement of three dimensions of Empathy (E): Compassionate Care (CC); Perspective Adoption (PA) Putting On Others' Shoes (POOS). The instrument applied was confidential and could only be known by the person who tabulated the data. The identification of the subjects was carried out by means of the number of

their identity card and information necessary to be able to cross the empathy data with other instruments of future application. The instrument was previously subjected to cultural validation (for students and professors) using the Judges Criteria method and it was comprised of five experts: three dentists, one psychologist (Ph.D.) and a university education professor (Ph.D.). All participants in the cultural validation agreed that it was not necessary to make changes to the questions.

It was subsequently subjected to a pilot test exclusively using students (30 dentistry students from another university were randomly selected) to verify understanding and the absence of double interpretations in JSE-S items). It was applied at different university campuses and clinical camps (classrooms) under relaxed conditions free of external interruptions. The instrument was applied by an operator who was properly trained to perform various functions. The most important were: making an introduction explaining the importance of this application in relation to obtaining information for the improvement of their curriculum in the future, answering all questions and doubts about the instrument, clarifying uncertainties and verifying that The instruments were answered appropriately to guarantee that all the questions were answered (without blank spaces) and with the correct scale values (1-7). In addition, ensure that they deliver the signed informed consent. In the event that any of these conditions were not met, the instrument was returned indicating the corresponding breach so that it could proceed to rectify its response. Students and teachers answered this instrument in classrooms or appropriate clinical areas in an academic environment and without stressors. The application was voluntary and the person who did not want to participate in this study was free to leave the classroom. This instrument was applied only once in each academic year or in academic meetings of professors to avoid comments between peers about this study and to avoid contamination of the answers.

Data Analysis

Data were subjected to reliability studies: Cronbach's α and the Intraclass Correlation Coefficient (ICC). Instrument psychometry was studied in this group of data and recently published results [25]. Confirmatory Factorial Analysis (CFA) was used to study the presence of three latent dimensions in conformity with Hojat et al. [26], and the presence of this model in both sexes was studied using measurement invariance [27]. Descriptive statistic estimates were formulated using average and standard deviation calculations. Comparisons between the averages of the different factors (areas, sex, and interaction between them) were made using a two-way analysis of variance (ANOVA) [25]. Effect size (using the eta-squared statistic: $\eta 2$) and test power ($1-\beta$) were calculated. Hierarchical comparisons of measures were made for cases in which the F test was significant using Tukey's test. Finally, empathy behavior graphs and their dimensions by area studied and sex were shown. The significance level used was $\alpha \leq 0.05$ and $\beta \leq 0.80$.

Ethical Approval and Consent for Participation

The study protocol was approved by the Ethics Committee in the UNPHU Investigation, CEI Resolution: 001-2018 (Declaration of Helsinki). All participants in this study approved and provided informed consent signed in writing. Furthermore, participants were informed that their participation was completely voluntary and that the authors would safeguard the confidentiality of data provided in any of the results taken from the study.

Results

Descriptive characteristics of the sample concerning sex and age in each of the areas studies are shown in detail in Table 1.

Table 1. Results of the means and standard deviations in empathy and each dimension, considering the factors area and sex.

Area	Sex	Media (E)	SD (E)	Media (CC)	SD (CC)	Media (PA)	SD (PA)	Media (POOS)	SD (POOS)	N
Basic and Preclinical Students	Female	104.50	11.981	33.92	8.217	59.50	4.95	11.08	2.682	26
	Male	107.65	16.059	35.95	9.46	60.31	8.851	11.39	3.765	152
	Total	107.19	15.541	35.66	9.295	60.19	8.389	11.34	3.622	178
Clinical Students	Female	106.48	13.321	34.76	8.865	60.67	7.378	11.05	4.248	21
	Male	110.86	14.446	37.72	8.616	62.30	7.137	10.84	3.532	136
	Total	110.27	14.339	37.32	8.68	62.08	7.167	10.87	3.622	157
Basic and Preclinical Professor	Female	114.06	11.078	40.50	6.24	60.19	5.947	13.38	3.442	16
	Male	109.20	12.637	34.80	11.032	61.00	3	13.40	2.302	5
	Total	112.90	11.335	39.14	7.728	60.38	5.334	13.38	3.154	21
Clinical Professor	Female	119.29	8.873	40.14	6.824	65.61	4.263	13.54	3.717	28
	Male	115.00	11.328	39.43	5.503	64.00	5	11.57	3.69	7
	Total	118.43	9.391	40.00	6.512	65.29	4.39	13.14	3.743	35
Total	Female	111.19	12.781	37.19	8.112	61.77	6.087	12.23	3.688	91
	Male	109.30	15.246	36.82	9.051	61.31	8.019	11.18	3.646	300
	Total	109.74	14.715	36.90	8.833	61.42	7.609	11.42	3.679	391

SD: Standard Deviation.

Cronbach's alpha values were satisfactory (standardization = 0.794), indicating internal reliability. Intraclass correlation amounted to 0.794 (F = 4.85; p = 0.0005; IC: 0.763, 0.822) and ratified observed reliability. Psychometric analysis of data before this study indicated the presence of three latent dimensions and invariance between sexes. Compliance with the theoretical model of the empathy measure used in the instrument was achieved and it was assumed to be equivalent between the sexes. Table 2 shows ANOVA results. Highly significant differences between average E (p=0.002) and average PA and POOS (p=0.049 and p=0.044, respectively) were found in the area factor.

Table 2. Faculty results: ANOVA application, F value, eta-square and potential.

Measure	F	P	Eta-Square	Potential
Empathy (E)	3.75	0.002	0.057	0.809
Area (A)	0.023	0.879	0.0005	0.053
Sex (S)	0.853	0.465	0.007	0.236
A*G	0.786	0.579	0.002	0.115
Compassionate Care (CC)				
Area (A)	2.01	0.112	0.015	0.516
Sex (S)	0.049	0.825	0.0005	0.056
A*S	1.176	0.319	0.009	0.316
Perspective Adoption (PA)				
Area (A)	2.651	0.049	0.2	0.646
Sex (S)	0.089	0.765	0.0005	0.06
A*S	0.266	0.85	0.002	0.101
Putting Oneself in the Other's Shoes (POOS)				
Area (A)	2.731	0.044	0.021	0.661
Sex (S)	0.476	0.421	0.001	0.106
A*S	0.594	0.62	0.005	0.173

p=Probability of Committing Type I Error; *=Symbol of Interaction Between Factors A and S.

Effect size values for E were satisfactory and differences between area averages were substantial. Test power surpassed the value of 0.80, indicating that the likelihood of committing a Type II error is low. The sex factor and interaction between area and sex factors (A*S) did not evidence any significant differences (p>0.05). PA and POOS effect size was also satisfactory. However, the test power was less than 0.80 in both cases. No significant differences were found in the CC dimension (p>0.05).

Table 3 shows the results of multiple average comparisons (Tukey's test). There were no significant E differences between students and professors in the basic and preclinical areas and clinical students (p=0.235). In addition, there were no significant differences between professors in the basic and preclinical areas and professors in the clinical area (p=0.263), but there were differences between clinical professors and students from both areas examined (p<0.05) (Figure 1a).

Table 3. Comparison of means of empathy and its components for three areas.

Measure/Area	N	Subsets (Differences between the Sunsets: p<0.05)		
		1	2	3
Empathy				
Basic and Preclinical Students	178	107		
Clinical Student	157	110.27		
Basic and Preclinical Professor	21	112.9	112.9	
Clinical Professor	35		118.43	
Intragroup Significance		0.235	0.263	
Compassionate Care				
Basic and Preclinical Students	178	35.66		
Clinical Students	157	37.32		
Basic and Preclinical Professor	21	39.14		
Clinical Professor	35	40		
Intragroup Significance		0.086		
Perspective Adoption				
Basic and Preclinical Students	178	60.19		
Basic and Preclinical Professor	21	60.38		
Clinical Students	157	62.08	62.08	
Clinical Professor	35		65.29	
Intragroup Significance		0.628	0.179	
Putting Oneself in the Other's Shoes				
Clinical Students	157	10.87		
Basic and Preclinical Students	178	11.34	11.34	
Clinical Professor	35		13.14	13.14
Basic and Preclinical Professor	21			13.38
Intragroup Significance		0.923	0.085	0.989

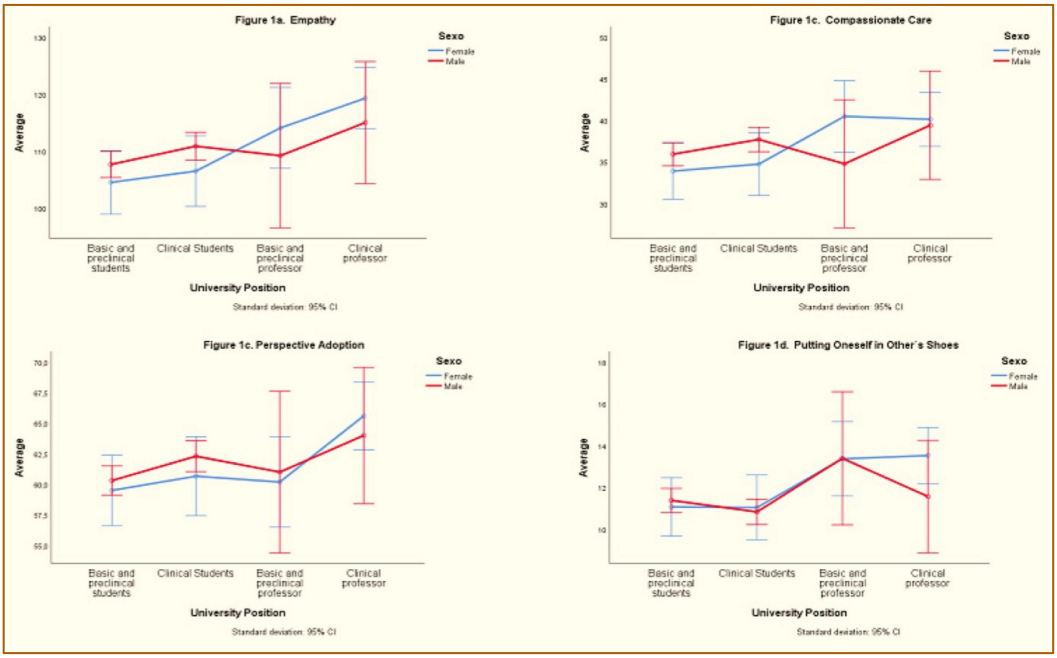

Figure 1. Graph of the distribution of empathy measures and their dimensions to area and sex. (CI): Confidence Interval.

There were no significant differences in CC between all the areas studied (p=0.086) (Figure 1b). PA evidenced the same situation as E (Figure 1c). Finally, there was no POOS difference between clinical students and basic and preclinical students (p=0.92); basic and preclinical students were no different from clinical professors (p=0.085); and clinical professors were no different from basic and preclinical area professors (p=0.989), but there were significant differences in descending order between professors in basic and preclinical areas compared to basic and preclinical students ($p<0.05$) and there were also significant differences ($p<0.05$) between clinical professors and clinical students (Figure 1d).

Discussion

No similar studies have been found in the literature related to the issue of comparing empathy levels between students and professors in general, except for the paper by Carvajal et al. [2]. In this case, it was seen that Empathy in clinical professors (and eventually also in professors from basic and preclinical area professors) had higher levels than students in the respective areas studied. These results allow us to observe that teachers have the potential to become a model for teaching students in relation to the empathic attitude toward patients. These same results could theoretically have a potentially significant meaning for teaching/learning empathy. However, empathy characteristics observed in clinical professors in this paper are necessary but insufficient to produce empathy "transfer" from the professor to the student. Empathy has been influenced by several factors [6,15-22], and a study into how these specifically modify empathy in professors and how these can positively or negatively contribute to the empathy teaching-learning process is consequently required.

Because empathy is the dialectic synthesis of the interaction between its dimensions [6,18,28,29], empathy levels detected in professors depend on "individual" behavior (scores achieved) in each dimension that has been seen from a strictly quantitative perspective, is the sum of scores in the three dimensions. However, the essential degree of empathy observed hinges on the actual interaction between said dimensions. The assessment of empathy levels and dimensions does not enable direct examination of said interaction, and the intrinsic properties of the same must be inferred. The empirical assessment allows us to infer that high levels of empathy in professors, in general, depend on levels in PA and POOS dimensions. These two dimensions have a cognitive nature and therefore intervention strategies to be executed by authorities from this university would have to consider the empowerment of aspects involved in PA and POOS for professors (from both areas) on the one hand and on active teaching-learning processes that should be used to consolidate empathy "transfer" to their students. In effect, if PA is able to separate the feelings, emotions and thoughts of dentists from the feelings, emotions and thoughts of the patients (avoiding empathetic infection) and POOS is a dimension of empathy whose "function" grants dentists the ability to penetrate and understand emotions, feelings, and thoughts of others (in our case: patients) [20,30], it would be logical to expect that interaction between these two dimensions in any intervention must be an essential part of the strategy to be applied. Level extension for these dimensions must address cognitive restructuring for students to better understand others (patients).

However, CC findings could imply a more complex problem to be solved. This complexity stems from the lack of differences between professors and students in all areas in this dimension, which creates an "imbalance" in the interaction between dimensions and consequently in empathy itself. The introduction of teaching-learning techniques in themselves, even if these are active, would not necessarily solve this problem. Solving the problem requires a specific triggering process that will interact with and integrate all dimensions to enable the desired "leap"; in concrete terms, a complex reconstruction of cognitive and emotional aspects of

the empathy attribute in subjects (in our case, in professors, but also in students). The CC dimension is particularly complex and is related to cultural, moral and family functioning processes, among many other factors [20,30-35]. This dimension is related to the emotional phase of empathy and is correlated to the ontogenic development of a person and to how these factors interact in the development of biological and neuronal fundamentals of empathy [33,34]. This interaction occurs starting from a child's first contact with his surroundings, especially in the mother-child relationship [36,37]. The information discussed could consequently lead us to infer that the CC dimension is not likely to be "taught" with psycho-pedagogical "techniques", as is the case with dimensions related to the cognitive aspect of empathy. It is suggested that the last window for modifying empathy and its dimensions in people is at university since neuronal development reaches full development in its surroundings at the age of approximately 25 [18]; but we must consider cerebral plasticity. Therefore, the idea that universities have the indisputable social responsibility for "teaching" empathy in professional training processes throughout a student's entire undergraduate term is proposed in several papers [17-19,23,38], and given the existence of cerebral plasticity, this responsibility lasts until completion of a graduate degree or major, as corresponding and also for professors.

It is not the purpose of this study, but we wish to highlight that considering the complexity of the empathy construct (concept), it is suggested that interventions must be preceded by an accurate diagnosis of empathy and a strategy logically stemming from this diagnosis. We must consider all possible factors that may contribute to encouraging or discouraging empathy or any specific dimension of the same in all of these. In addition, all active teaching-learning techniques addressing all tiers involved in student training must be considered. Finally, this strategy must consider that any measure attempting to evaluate success will only become evident over the long term. This process (dynamic assembly of the three dimensions) is relatively slow and must be proven by stages of (internal) intrinsic process reconstruction progress in integrating said dimensions.

This paper is limited by the number of students and professors examined. Therefore, estimations made by descriptive statistics and comparisons made may be biased to some degree. However, this does not prevent the findings reported from constituting substantiated trends.

Conclusion

Empathy and PA and POOS dimension levels are generally higher for professors than students in both areas examined, except for the CC dimension. The diagnosis of empathy conducted suggests that the degree of development for the cognitive component of empathy in professors can theoretically be considered one of the positive factors that may influence the empathy training process. However, the lack of CC differences between the areas examined may hamper the possibility of actual transmission of empathy as an integral concept for students of dentistry examined in this paper.

Authors' Contributions

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All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

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Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

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