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Original Article

Empathy, Components of Empathy and Curricular Evaluation of the Faculty of Dentistry, Evangelical University of El Salvador

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Abstract

Objective: To estimate empathy levels in general and empathic growth potential in dental students. **Material and Methods:** This is an exploratory, transversal study. The study population is made up of students from the first to fifth academic year of the career of dentistry of the Evangelical University of El Salvador (El Salvador) (148/240, 61.67% of the population studied). The participants were given the Jefferson Empathy Medical Scale, the Spanish version for medical students, validated in Chile and Mexico, and culturally adapted in El Salvador. A bifactorial variance analysis (model III) was applied to find differences in the means between the courses, between the genders and in the interaction between these two factors. The data were described using simple arithmetic graphs, processed with SPSS 22.0. Total growth potential was estimated. **Results:** Differences were found between academic years, but not in gender of empathy in general and in its components. The levels of empathy and its components are low in relation to other studies. The behavior of the levels of empathy agrees with the concept of empathic decline. The masculine gender presented levels of empathy, in absolute values, greater than the feminine. There is considerable potential for growth in empathy and that of its components. **Conclusion:** The behavior of the levels of empathy observed in this work does not agree with the concept of empathic decline. The differences observed between the genders were not consistent with those reported by other authors and it is possible that these findings constitute further evidence that empathy itself is not a female attribute.

Keywords: Empathy; Dentistry; Gender Identity; Curriculum.

Introduction

The dentist-patient relationship is complex, subjective and intersubjective in itself and, therefore, this relationship is a component of clinical care [1]. As a consequence, biomedical sciences today must consider not only what is inherent in the clinical process, but also to such a component. The attribute of empathy with patients arises as a necessity for the dentist to be able to efficiently and effectively exercise care and follow-up [2-4].

Empathy has two essential components: cognitive and emotional [5,6]. Empathy is associated with the understanding that patients' experiences and feelings are mutually interacting factors in the development of an entity [7,8]. Measurements of empathy using different instruments have not been able to verify predictive validity; however, these measurements have a probative effect for the diagnosis of empathy in the formation of medical professionals [9-11].

The objective of this study is to estimate the levels of empathy and to make a diagnosis of the empathic situation in dental students of the Evangelical University of El Salvador (UEES), El Salvador.

Material and Methods

Ethical Aspects

This exploratory, transversal study was ruled by the norms of Helsinki, with written consent obtained from all participants (all over 18 years of age) involved in the study. The consent and study was independently reviewed approved by the ethics committee of the Evangelical University of El Salvador.

Data Collection

The study population is made up of students from the first to fifth academic year of the career of Dentistry of the Evangelical University of El Salvador (El Salvador) (n=148 of 240, 61.67% of the population studied), with the following stratifications by the factor Course Year (C): First: 36; Second: 34; Third: 35; Fourth: 19 and Fifth: 24. In the factor Gender (G), the sample composition was as follows: female = 43 and male = 105. Data collection was done in April 2016.

The Jefferson Medical Empathy Scale (JMES), Spanish version for medical students (S version) was applied, validated in Mexico and Chile 5,12 and adapted for students of dentistry 13,14. The application was confidential (neutral operator), and prior to the application of the JMES to the students of dentistry of UEES, it was submitted to judges (three relevant dental professionals) in order to verify cultural and content validity 15. The students' understanding of the culturally adapted scale was performed through a pilot test.

Statistical Analysis

The internal reliability of the data was estimated using the general Cronbach's alpha and the values of this statistician as each of the elements (questions) were eliminated, interclass correlation

coefficient, Hotelling's T₂, and Tukey's non-additivity test, estimating the mean and standard deviation. A bifactorial analysis of variance (ANOVA) was applied (model III) in order to find differences in course year (C), gender (G) and interaction of these two factors (C x G). The data were described using simple arithmetic graphs and processed using the statistical software SPSS 22.0.

The Total Possible Growth Potential (TPGP) was considered as the quotient between two magnitudes: a) the actual difference between the observed scores of fifth-year students minus the score of first-year students (D1) with respect to b) the difference between the highest value of empathy allowed by the instrument (140) and the effective value of the empathy of first-year students (D2): $TPGP = D1 / D2$. This indicator allows evaluating the magnitude of advancement, regression or stagnation of empathy and can be used in both cross-sectional as well as longitudinal studies. The components operated in the same way, the maximum values were considered specifically for each one of them. The significance level used was $\alpha \leq 0.05$ and $\beta < 0.20$ in all cases.

Results

Cronbach's alpha was satisfactory (untypified = 0.852 and typified = 0.855), from which it is inferred that the data have internal reliability. The total Cronbach's alpha value, if the element (question) were deleted, ranged from [0.835; 0.860] and it is inferred that the test demonstrated reliability, regardless of whether any of the elements are eliminated. The interclass correlation coefficient was 0.803 ($F = 5.081$, $p = 0.001$), which confirms good reliability of the data. The T₂ test of Hotelling ($F = 125.8$, $p = 0.001$) and Tukey non-additive ($F = 1.69$, $p = 0.169$) allow, in the first case, to infer that the means of the questions are different from each other, which shows that not all contribute equally to the global mean (mean = 5.57) and shows variability between the responses of the instrument and, in the second it is inferred that there is no additive character in the data and shows that the methods used to analyze them were correct. The results of the estimates of means (total and combined by factor), standard deviation and sample size for each level of the two factors studied are shown in Table 1.

Table 1. Results of the estimation of the arithmetic mean and the standard deviation of the empathy in the factors of the course year and the gender.

Course Year	Gender	General Empathy		Compassionate care		Taking Perspective		Ability to Understand Others		n
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	
First	Female	88.82	16.714	25.91	5.186	51.36	13.662	11.00	1.897	11
	Male	97.72	23.207	28.92	9.336	54.72	14.602	12.08	3.673	25
	Total	95.00	21.596	28.00	8.332	53.69	14.212	11.75	3.246	36
Second	Female	86.00	11.497	25.33	7.278	49.50	10.032	9.42	2.968	12
	Male	100.86	15.441	31.05	7.524	57.50	9.471	10.91	3.853	22
	Total	95.62	15.740	29.03	7.833	54.68	10.280	10.38	3.593	34
Thrid	Female	111.92	13.035	36.75	6.890	61.83	6.780	10.50	3.555	12
	Male	114.48	15.834	37.65	10.404	63.04	8.037	10.87	4.060	23
	Total	113.60	14.789	37.34	9.251	62.63	7.550	10.74	3.845	35
Fourth	Female	105.67	23.544	36.33	11.590	54.67	9.074	12.67	3.786	3

	Male	106.63	19.026	34.56	9.033	59.94	10.686	9.25	3.550	16
	Total	106.47	19.062	34.84	9.130	59.11	10.402	9.79	3.706	19
Fifth	Female	110.60	21.824	39.60	8.849	57.20	10.895	12.80	3.701	5
	Male	103.42	17.366	33.74	10.593	57.32	9.551	9.84	3.962	19
	Total	104.92	18.103	34.96	10.361	57.29	9.594	10.46	4.021	24
Total	Female	98.19	18.948	31.09	9.099	54.67	11.135	10.74	3.125	43
	Male	104.44	19.148	33.01	9.783	58.39	11.046	10.73	3.881	105
	Total	102.62	19.237	32.45	9.598	57.31	11.163	10.74	3.667	148

SD= Standard deviation.

Table 2 shows the results of the ANOVA applied to empathy in general and to each of its components. It was observed that, in “General Empathy”, factor C ($p = 0.001$), but not G or C x G ($p = 0.267$ and $p = 0.331$, respectively) were highly significant; the eta-square value was satisfactory and the observed power (0.998) is good; however in the factor of gender and in the interaction C x G, the eta-square and the power of 0.64 are not satisfactory: the average of women was 98.18 and of men was 104.62 (maximum of 140). In the component of “Compassionate Care”, the same occurred as in empathy in general: only highly significant differences were found in factor C ($p = 0.001$); the value of eta-square (0.182) and the observed power (0.997) were highly satisfactory. The average of the women was of 25.91 and of the men of 28.92 (of a maximum of 49 points). In the component of “Taking the Patient’s Perspective”, it was observed that factor C was significant ($p = 0.005$) and that factor G and interaction C x G were not significant ($p = 0.102$ and $p = 0.148$) with unsatisfactory eta-square and potency values; the values of empathy in women were 51.36 and of men were 59.08 (out of a maximum of 70 points). Finally, in the component of the “Ability to Understand Others” we found that none of the factors were significant ($p > 0.05$), with unsatisfactory eta-square and power values. The women achieved a value of 10.73 and the men of 10.74 (of a maximum of 21 points). All these results compel the results to be discussed with caution, especially where the value of eta-square and potential value were not completely satisfactory.

Table 2. Results of the application of the ANOVA, the value of F, eta-square and power of the test used.

General Empathy	F	p	Eta Square	Power
Course (C)	7.23	0.001	0.173	0.995
Gender (G)	1.24	0.267	0.009	0.198
C*G	1.20	0.331	0.054	0.371
Compassionate Care				
Course (C)	7.65	0.001	0.182	0.997
Gender (G)	0.049	0.826	0.003	0.056
AA*G	1.27	0.285	0.035	0.389
Taking Perspective				
Course (C)	3.847	0.005	0.10	0.888
Gender (G)	2.703	0.102	0.019	0.372
AA*G	0.544	0.704	0.016	0.179
Ability to Understand Others				
Course (C)	0.636	0.638	0.018	0.204
Gender (G)	0.861	0.355	0.006	0.151
AA*G	1.724	0.148	0.048	0.517

P = Probability of committing type I error; *Symbol of interaction between factors AA and G.

Figure 1 shows the distribution of the average of empathy in both genders, which are low in the first two years, but tends to increase in the third year, fall again in the fourth year and then diverge (women increase and men decrease). The estimate of the TPGP in students was $(104.92-95.0) / (140-104.922)$; that is, 28.28% of that potential covered.



Figure 1. Results of the behavior of the means of General Empathy in the interaction of the factors Course Year and Gender.

Figure 2 shows the distribution of means of the empathy component “Compassionate Care” in both genders. This distribution is similar to that of general empathy (Figure 1). The estimate of TPGP in students was $(34.96-28) / (49-34.96)$; that is, 49.57% of that potential covered.

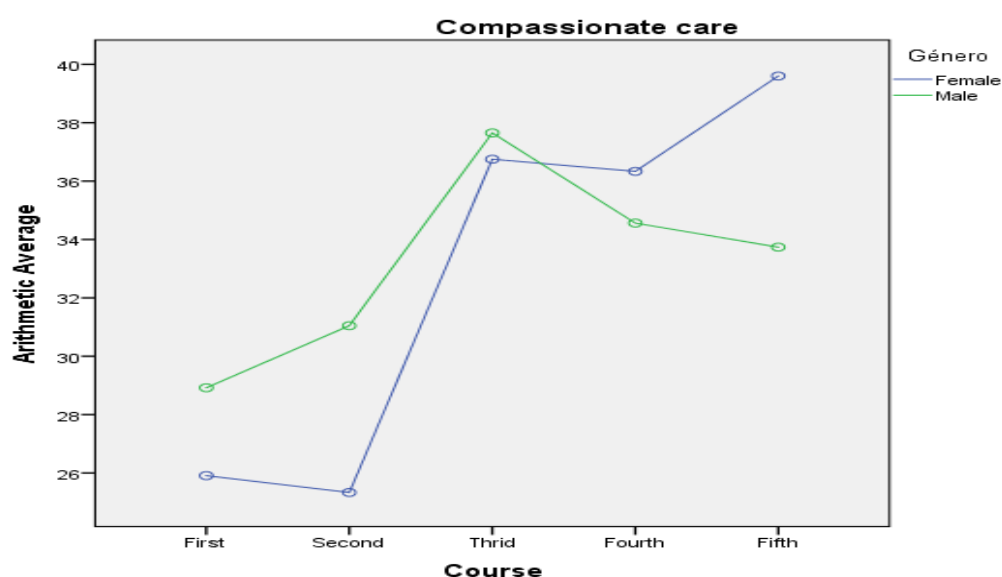


Figure 2. Results of the behavior of the means of the Empathy component, Compassionate care, in the interaction of the Course Year and Gender factors.

Figure 3 shows the distribution of the means of the component “Taking the Patient’s Perspective” in both genders and is low in the first two years, but tends to increase in the third year, then decline in the fourth year and are equal in the fifth year with a slight rebound in women. The estimate of TPGP in students was $(57.29-53.69) / (70-57.29)$; that is, only 26.20% of that potential covered.

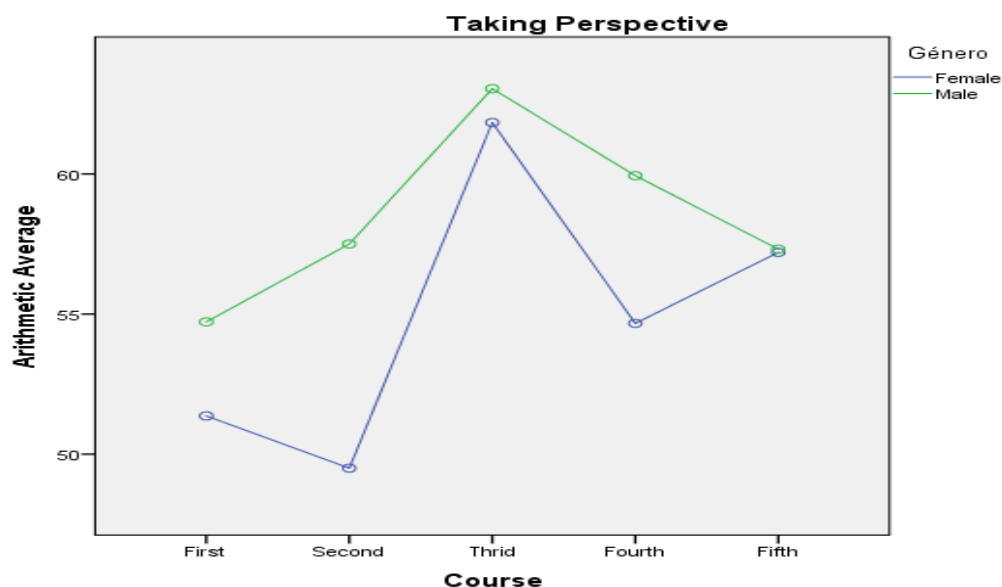


Figure 3. Results of the behavior of the means of the Empathy component, Taking perspective, in the interaction of the Course Year and Gender factors.

Finally, Figure 4 shows the distribution of the means of the component “Ability to Understand Others”; that is low in the first two years, but tends to increase in the third year, then decline in the fourth and equate in the fifth year with a slight rebound in women. The estimate of TPGP in students was $(10.46-11.75) / (21-10.46)$; that is, -12.24% of that potential, with an evident decrease.



Figure 4. Results of the behavior of the means of the Empathy component, Ability to understand others, in the interaction of the Course Year and Gender factors.

Discussion

One of the purposes of the evaluation of empathy in students, in any faculty of dentistry, is to measure as accurately as possible the levels of this attribute in them to make the best possible diagnosis of the empathic situation that they possess. This diagnosis will guide future pedagogical-didactic actions aimed at implementing the necessary interventions to improve the introduction of the teaching-learning processes of empathy. Then, the exercise of analyzing the characteristics of the data and publishing the estimation of statisticians destined to evaluate the quality of the data, is not an exaggerated exercise. It was observed that empathy levels are low in general empathy, as well as in each and every one of its components. This situation forces a separate discussion [1-3,6,13-17].

General Empathy

The distribution of "General Empathy" was ascending until the third year and a subsequent decrease in the following. This result is consistent with the "empathic decline" model, which is manifested by a decline in empathy values from the third year, preceded by an increase between the first and third years [15,16.] This distribution has tried to be explained by attributing this decline to different factors: stress [18,19], and academic load 20, among others. However, there are studies that have observed that such decline has not been found in students of dentistry and medicine [1,3,6,13,14,21], which suggests that "decline" could be a particular case of different models of the behavior of empathy through the years [14]. This situation suggests that any intervention aimed at raising empathy in students should not be based on the idea of the existence of only a standard model. The differences found between the genders favor the masculine, between the first and second years in terms of absolute values (Figure 1). It has been demonstrated 22 that there is gender variability in relation to empathy in a study in 18 dental schools in Latin America. As a consequence, it is not possible to state categorically that women are more empathetic than men in all populations studied, despite the fact that authors have observed the opposite [8,23-27].

This variability has a direct effect on curricular conformation. The values of $R^2 = 14.9\%$ estimated in this research is evidence of the little variability that empathy, the course and gender factors and the latter explain very little about such variation; a result consistent with those of other studies [28]. Most studies do not take this latter statistician into consideration (R^2) when empathy is studied within a given population. On the other hand, empathy variability has been found when this attribute was compared in different populations [14,17,22,29] and is evidence that different populations may differ in empathic behavior.

In the population of students examined it can be affirmed that there is a margin of "empathic growth", since only 28.28% was verified in relation to the total potential of growth (100%). It is low and this situation requires a reflection that allows initiating the necessary actions to foment a greater growth. We are not aware of estimates of this type in other works and we cannot establish comparisons in similar works.

Compassionate Care

The distribution of empathy levels associated with this component was similar to that of “General empathy” (Figure 2), however, this "coincidence" cannot be explained in the same way. This similarity could be associated with the TPGP, which was the largest of all components, with no statistical differences between genders, but men predominantly increase to the third year and, in higher years, in absolute terms, women have the highest values of this component. This interpretation is only numerical and requires a particular discussion [29] that is not related to the objectives of this work. Nevertheless, it is emphasized that, even though the levels of empathy in this component were low, it was the one with the greatest development.

Taking the Patient's Perspective

In this component, the behavior is different from “General Empathy” and “Compassionate Care” (Figure 3). Empathic decline, in the manner described by Hojat al. [16], in this component is clearly manifested in both genders. This generates contradictions with some studies that suggest that cognitive components are more developed in the male gender [30,31], a finding cannot be explained in this paper. On the other hand, the TPGP is very low, which would indicate that, in general, there is little development of this component of the cognitive type and shows a possible window that allows the development of this dimension in students with the aim of raising the levels of empathy.

Finally, in the case of "Ability to Understand Others" (Figure 4), also with a low TPGP shows that women acquire higher levels of this component in relation to men in the last three years. This result is consistent with other studies [31,32].

Generalization: a) The separate study of the components is an abstraction and there is a dialectical relationship between them [22,29]; b) The component of “Compassionate Care” is the one with the greatest potential growth and is characterized by being higher in women, which coincides with other studies that suggest that the emotional sphere is more developed in women than in men [32,33] and c) the observed weaknesses in the potential growth of empathy and its components could be a consequence of a curriculum that does not rationally consider the incorporation of active learning teaching processes around the introduction of elements that allow the best possible apprehension of empathy and a balanced development of its components.

As a consequence of the findings, recognizing values as well as weaknesses in students and graduates is the first step in establishing strategies to ensure the most developed training possible. From the curricular design and adoption of academic experiences that could potentially have a positive impact on empathy formation, several strategies and techniques have been described [34-38]. However, it is not yet clear whether the positive change in the levels of empathy achieved by these specific interventions may last in time. On the other hand, it remains to be determined whether the use of clinical simulators or clinical simulation environments contributes to empathic capacities and, if they do, what is the real influence on these capacities.

Conclusion

The behavior of the levels of empathy observed in this work does not agree with the concept of empathic decline. This is further evidence that this process is a particular case and not a general one. The differences observed between the genders were not consistent with those reported by other authors and it is possible that these findings constitute further evidence that empathy itself is not a female attribute. The levels of empathy observed in general and of each of its components are low and there is a high value of empathic development potential; as a consequence, results such as those found strongly suggest to the authorities of any university the need to take measures, both in the curriculum, as well as teaching-learning methodologies, which must be implemented in the pedagogical processes associated with teaching dentistry. The modifications that must be made must have an integrative conception that allows the evaluation of empathy in a longitudinal way and also the influence of the new curriculum on other attributes that are intrinsic to the dental professional's activity.

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