

Levels of empathy in dentistry students: measurement and comparison in two academic periods. Universidad Católica de Cordoba (UCC) Argentina

Niveles de empatía en estudiantes de odontología: medición y comparación en dos períodos académicos. Universidad Católica de Cordoba (UCC) Argentina

Teresa Varela de Villalba¹, Maria Jorgelina Ulloque², Silvina Villalba³, Raúl Villalba⁴, Víctor Patricio Díaz-Narváez^{5,6}

Abstract

Objective: the aim of the study was to measure empathy levels among UCC dentistry students in 2016 and to compare them with a previous record from 2012 in order to establish if it is possible to improve these levels by emphasizing their importance without any specific training. **Material and Methods:** the sample was formed by students from 1st to 5th year; 2016: 173 (79.36%) and 2012: 189 (84.75%). The sample was stratified by academic year and gender. A Spanish version for health science students of Jefferson's Empathy Medical Scale was applied; the version is validated in Mexico and Chile, and culturally adapted by judges in Argentina. **Results:** in 2016, there was a difference between women and men in empathy in general ($F=$

Fecha de recepción: 2 de octubre de 2017
Fecha de aceptación: 30 de enero de 2018

¹ PhD in Dentistry. Universidad Nacional de Córdoba (UNC) and Universidad Católica de Córdoba (UCC), Argentina. Professor and Consultant at the School of Dentistry UNC and UCC - Researcher Category II at SECyT. tebeva@hotmail.com

² Master of Community Oral Health. Universidad de Buenos Aires (UBA), Argentina. Director of the Dentistry Career, School of Medical Sciences, UCC. Associate Professor in Prevention in Clinical Practice I. mjulloque@yahoo.com.ar

³ PhD in Dentistry. Universidad Nacional de Córdoba (UNC), Argentina. Associate Professor in Integral Pediatric and Adolescent Practice I of the Dentistry Career, School of Medical Sciences, UCC. Universidad Católica de Córdoba (UCC), Argentina. silvillalba@hotmail.com

⁴ PhD in Dentistry. Universidad Nacional de Córdoba (UNC), Argentina. Associate Professor in Orthodontics and Occlusion and ATM, Adjunct Professor of Oral Maxillofacial Physiology, Dentistry Career, School of Medical Sciences, Universidad Católica de Córdoba (UCC), Argentina. rvillalba@centrovillalba.com.ar

⁵ Ph.D in Biological Sciences. Facultad de Salud. Universidad Bernardo OHiggins. Av. Viel 1497. Santiago Centro. Chile.

⁶ Investigador Adjunto. Facultad de Ciencias de la Salud. Universidad Autónoma de Chile. Santiago. Chile. **Correspondence:** Víctor Patricio Díaz Narváez. Av. Copayapu 2862. Copiapó. III Región. Chile. Celular: +56 9 9161 4015. victor.diaz@uda.cl

108.56, $M = 98.859$) and in their components, with the exception of "Putting yourself into other's shoes". Both genders tended to decrease empathy in general and its components from 3rd year with a tendency to increase again in 5th year, with the exception of the last component. The difference in empathy in general between students of 5th year and 1st year was assessed in 29.8% of possible growth. The components studied were "Compassionate care" 18.99%, "Taking perspective" 36.84% and "Putting yourself into other's shoes" 6.71%. In the 2012-2016 comparison, the questions that presented significant differences were number 3, 5, 10, 16, 17 and 18.

Conclusions: an empathy diagnosis is provided that will help in the elaboration of strategies to incorporate the acquisition of this aptitude into the curriculum of this University's School of Dentistry.

Keywords: dentistry, professional training, empathy, empathic attitude.

Resumen

Objetivo: el objetivo del estudio fue medir los niveles de empatía entre los estudiantes de odontología de UCC en 2016 y compararlos con un registro anterior de 2012 para establecer si es posible mejorarlos al enfatizar su importancia sin ninguna capacitación específica.

Material y Métodos: la muestra compuesta por alumnos de 1° a 5° año; 2016: 173 (79.36%) y 2012: 189 (84.75%) se estratificó por año académico y género. Se aplicó una versión en español para estudiantes de ciencias de la salud de Jefferson's Empathy Medical Scale; La versión está validada en México y Chile, y adaptada culturalmente por jueces en Argentina.

Resultados: en 2016, hubo una diferencia entre mujeres y hombres en la empatía en general ($F = 108.56$, $M = 98.859$) y en sus componentes, con la excepción de "ponerse en el lugar del otro". Ambos géneros tendieron a disminuir la empatía en general y sus componentes a partir del tercer año con una tendencia a aumentar nuevamente en el quinto año, con la excepción del último componente. La diferencia en la empatía en general entre los estudiantes de 5° y 1° año se evaluó en el 29,8% de posible crecimiento. "Atención compasiva" 18.99%, "Tomando perspectiva" 36.84% y "Poniéndose en el lugar del otro" 6.71%. En la comparación 2012-2016, las preguntas que presentaron diferencias significativas fueron los números 3, 5, 10, 16, 17 y 18.

Conclusiones: se proporciona un diagnóstico de empatía que ayudará en la elaboración de estrategias para incorporar la adquisición de esta aptitud en el currículo de esta Escuela Universitaria de Odontología.

Palabras clave: odontología, formación profesional, empatía, actitud empática

INTRODUCTION

The relationship between the health care provider and the patient entails a subjective and intersubjective relationship that goes beyond the clinical aspect of any treatment (1,2). In order to attain humanization in health care, every health care provider must be able to develop an empathic communication with his/her patients (3,4).

Empathy in health care can be understood as a cognitive and behavioral attribute that implies the ability to understand how the patient's experiences and feelings are influenced by his/her disease and symptoms as well as the ability to transmit that understanding to the patient (5,6). This is related to several attributes; among them we can mention better therapeutic relationships and good clinical results (1,7,8).

It has been proposed that empathy is modifiable and that it can be developed intentionally (9,13). De la Rosa et al. (14) state that the training in interpersonal skills must be permanent during the process of professional development. It is believed that universities are responsible in developing this attribute.

In this regard, the orientation of health education curricula to the development of empathy is very relevant (15). As regards gender implication in the dentist-patient relationship, women have been considered in general more competent than men; they are considered to be more caring and expressive apart from humanitarian and compassionate (11).

We aim to assess UCC Dentistry first to fifth year students' empathy levels, considering gender and academic year and to compare these results to the ones obtained in a similar group of students five years ago (16). Our objective is to prove if there have been any changes in empathy levels after a sustained information (throughout the career) on the importance of this attribute.

MATERIALS AND METHODS

Exploratory, cross-sectional study. Population: UCC Dentistry students from 1st to 5th year of the career (2016 N=218; 2012: N=223). 2016 sample: 173 (79,36%); 2012 sample: 189 (84,75%). The study was stratified taking into account two variables: academic year (AA) and gender. A Spanish version for health science students of Jefferson's Empathy Medical Scale was applied; the version was validated in Mexico and Chile, and culturally adapted to Argentina according to the criterion of judges in order to verify cultural and content validity (20). A pilot test was applied. The study was performed according to Helsinki Norms and approved by the UCC Committee on Ethics. The students signed an informed consent (18). Data underwent tests

for Normality and Equality of variance. Internal reliability was estimated by Cronbach's alpha general and elements were eliminated by intraclass correlation coefficient, Hotelling T2 test and Tukey's test. Medians, standard deviation, standard error of the median and confidence interval (IC) were estimated.

A Cronbach's Alpha coefficient of 0.72 was obtained. This *confirmed* the remarkable *internal consistency* and stability of the scale.

An analysis of bifactorial variance (ANOVA) model III was applied in order to find the differences of the medians among academic years, gender and these factors interactions. Data were described by means of simple arithmetic charts and processed with SPSS 22.0. Possible growth total potential (PTCP, its initials in Spanish) was considered as the quotient between two magnitudes: a) the real difference between the scores observed in 5th year students minus the scores of first year students (D1) with respect to b) the possible difference between the greater empathy measurement this instrument allows (140) as to the real empathy score of first year students (D2): $PTCP = D1/D2$. PTCP is an indicator of the degree of progress in empathy levels and they can be observed in both longitudinal and cross-sectional studies. The level was $\alpha \leq 0,05$ and $\beta < 0,20$ in every case. The comparison of empathy data in students of this career (2012) obtained in a previous study (16) with those observed in the present study was made by means of a t-student test. The significance level used was $\alpha \leq 0,05$ and $\beta < 0,20$ in every case.

RESULTS

Kolmogorov-Smirnov and Levene tests were not significant ($p > 0,05$); data were distributed in a normal way and there was homoscedasticity. Cronbach's alpha was satisfactory (non

typified=0,766 and typified=0,789), they were assumed to have internal consistent reliability. Cronbach's alpha total value, if an element was eliminated, fluctuated [0,771;0,804], reliability was proved independently of one of the elements elimination,

The *Intraclass Correlation Coefficient* (ICC) was 0,792 ($F=4,82$; $p=0,001$), confirming adequate reliability. T^2 Hotelling test ($F=29,99$; $p=0,001$) and *Tukey's Test* for non-Additivity ($F=29,41$; $p=0,001$) allow, in the first case, to infer that the medians of the questions are different among them, and that not all of them count equally for the average median (5,29): variability among answers to the instrument and, in the second case, to infer an additive character of the data (a larger sample is required).

Results show that adequate methods were used for the analysis. Results of the medians estimates (total and combined by factor), the typical error of the median and the sample size are shown in Table 1.

Table 2 shows the results of empathy values in general and their components. In "General Empathy", both the differences in values observed in each academic year and in both genders were highly significant ($p<0,005$) as well as the interaction ($p<0,05$). The value of the median among women was 108,56 (common median error (ETM, its initials in Spanish, = 1,11) and among men 98,859 (ETM, its initials in Spanish, =1,93). The factors studied help us explain the 28,95% empathy variation in general ($R^2=0,289$). The estimation of the potential growth of first year students was 13,33 points, i.e., only 29,08% of the total possible growth.

In the "Compassionate Care" component, equal results to "General Empathy" were found. Both factors were found to be highly

significant ($p<0,005$); interaction was significant ($p<0,05$). The median value in both genders was: 39,62 among women (ETM=0,511); and 35,85 among men (ETM=0,886). These two factors account for the variance component of 28,5% ($R^2=0,285$). First year students' potential growth estimate was 18,99% of the total possible empathy growth.

In the "Taking Perspective" component, the differences found among different academic years and genders were highly significant ($p<0,005$) in both factors; however, interaction was not significant ($p>0,05$). The median value in both genders was: 57,71 among women (ETM=0,763) and 57,72 among men (ETM=1,32). Both factors account for 18,2% of the empathy variance component ($R^2=0,182$). The potential growth estimate was 7,21 points, i.e., 36,84% of the total possible empathy growth.

Finally, none of the registered differences among the studied factors were significant ($p>0,05$) in "Putting Yourself in Others' Shoes" component. The gender median value was: 11,21 among women (ETM=0,305) and 10,29 among men (ETM=1,53). The studied factors only account for 1,7% of this component variance ($R^2=0,017$). The potential growth estimate was -0,68 points, i.e., there was a -6,71 decrease of the total possible growth.

In Figure 1 (1a-1d) the median behaviors of academic year and gender factor levels are shown. Females were found to behave different from males as to "General Empathy" and in every component with the exception of "Putting Yourself in Other's shoes". In every case, both males and females tended to decrease their general empathy attitude and their components from third year onwards; yet, there was a mild tendency to increase it again (especially in fifth year) with the exception of the last component.

In figure 3 the results of the comparison between the medians of the answers to “General Empathy” significant questions are shown. The answers were P3 and P18 related to “Putting Yourself in Other’s Shoes” and P5, P10, P16 and P17 related to the “Taking Perspective component”. No question related to the “Compassionate care” component was significant

($p > 0,05$). The positive values of t-student test show that there was an increase in empathy associated to the corresponding component in the aspect referred to the specific question while the negative values show there was a relapse with respect to the first measurement in the same aspects.

Table 1. Result of the estimation of descriptive statistics of empathy levels in each factor and in each component studied

| Academic Year | Gender (n) | Median | Common median error | Confidence interval 95% | |
|----------------------------------|-------------|---------|---------------------|-------------------------|-------------|
| | | | | Lower limit | Upper limit |
| General Empathy First Year | Female (27) | 95,852 | 2,402 | 91,110 | 100,594 |
| | Male (13) | 92,462 | 3,461 | 85,627 | 99,296 |
| Second Year | Female (26) | 110,231 | 2,447 | 105,398 | 115,063 |
| | Male (7) | 105,000 | 4,717 | 95,686 | 114,314 |
| Third Year | Female (27) | 114,519 | 2,402 | 109,776 | 119,261 |
| | Male (12) | 108,000 | 3,602 | 100,886 | 115,114 |
| Fourth Year | Female (22) | 110,409 | 2,661 | 105,155 | 115,663 |
| | Male (8) | 85,500 | 4,412 | 76,788 | 94,212 |
| Fifth Year | Female (25) | 111,640 | 2,496 | 106,712 | 116,568 |
| | Male (6) | 103,333 | 5,095 | 93,273 | 113,393 |
| Compassionate Care First Year | Female | 33,704 | 1,105 | 31,521 | 35,886 |
| | Male | 32,000 | 1,593 | 28,855 | 35,145 |
| Second Year | Female | 41,000 | 1,126 | 38,776 | 43,224 |
| | Male | 39,000 | 2,171 | 34,714 | 43,286 |
| Third Year | Female | 42,667 | 1,105 | 40,484 | 44,849 |
| | Male | 39,417 | 1,658 | 36,143 | 42,690 |
| Fourth Year | Female | 40,227 | 1,224 | 37,810 | 42,645 |
| | Male | 30,000 | 2,030 | 25,991 | 34,009 |
| Fifth Year | Female | 40,480 | 1,149 | 38,212 | 42,748 |
| | Male | 38,833 | 2,344 | 34,204 | 43,463 |
| Taking Perspective First Year | Female | 50,481 | 1,650 | 47,223 | 53,740 |
| | Male | 50,385 | 2,378 | 45,688 | 55,081 |
| Second Year | Female | 58,654 | 1,682 | 55,333 | 61,975 |
| | Male | 56,143 | 3,241 | 49,743 | 62,543 |
| Third Year | Female | 60,407 | 1,650 | 57,149 | 63,666 |
| | Male | 56,833 | 2,475 | 51,945 | 61,721 |
| Fourth Year | Female | 58,727 | 1,828 | 55,117 | 62,337 |
| | Male | 45,250 | 3,032 | 39,263 | 51,237 |
| Fifth Year | Female | 60,280 | 1,715 | 56,893 | 63,667 |
| | Male | 55,000 | 3,501 | 48,087 | 61,913 |

Continúa...

| Academic Year | Gender (n) | Median | Common median error | Confidence interval 95% | |
|---|------------|--------|---------------------|-------------------------|-------------|
| | | | | Lower limit | Upper limit |
| Putting oneself in other's shoes First Year | Female | 11,667 | ,660 | 10,364 | 12,970 |
| | Male | 10,077 | ,951 | 8,199 | 11,955 |
| Second Year | Female | 10,577 | ,672 | 9,249 | 11,905 |
| | Male | 9,857 | 1,296 | 7,298 | 12,416 |
| Third Year | Female | 11,444 | ,660 | 10,142 | 12,747 |
| | Male | 11,750 | ,990 | 9,796 | 13,704 |
| Fourth Year | Female | 11,455 | ,731 | 10,011 | 12,898 |
| | Male | 10,250 | 1,212 | 7,856 | 12,644 |
| Fifth Year | Female | 10,880 | ,686 | 9,526 | 12,234 |
| | Male | 9,500 | 1,400 | 6,736 | 12,264 |

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

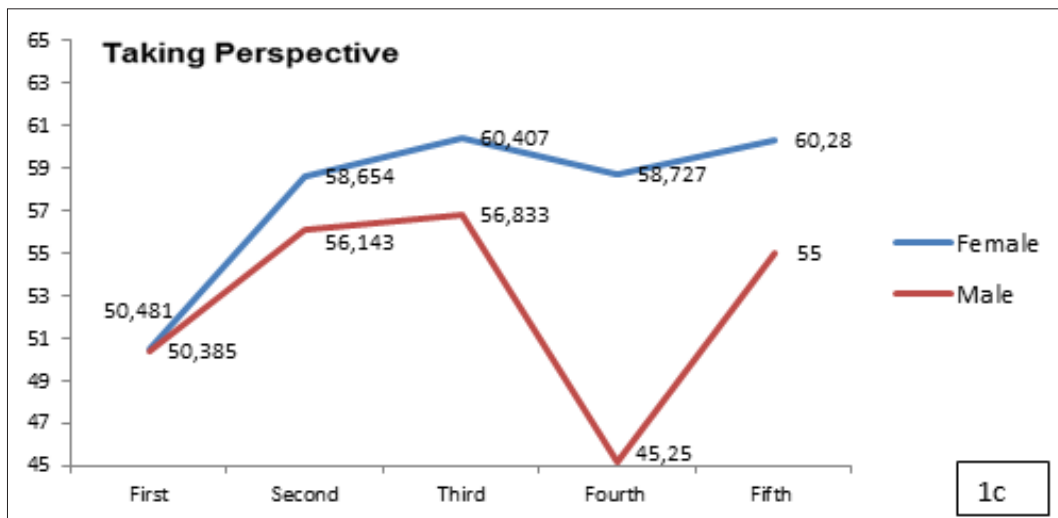
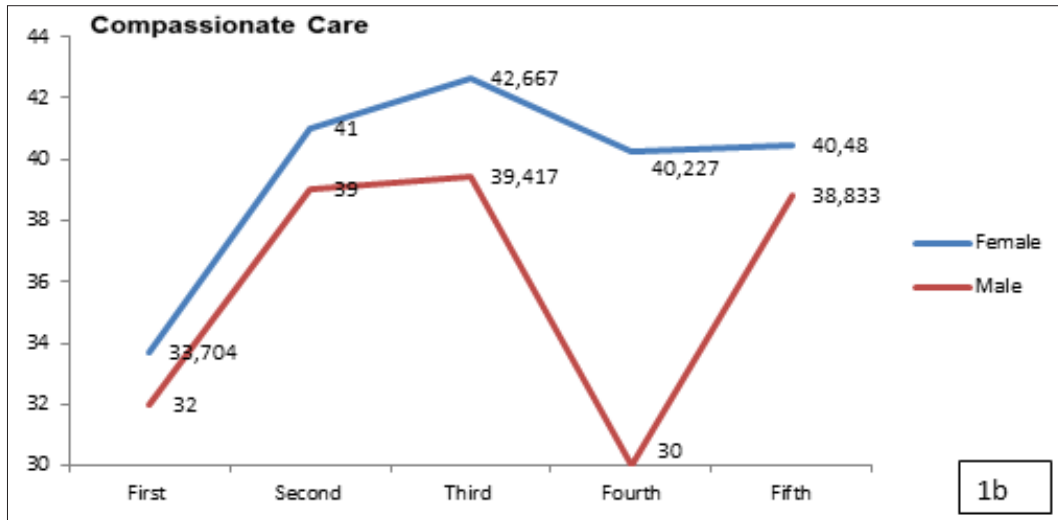
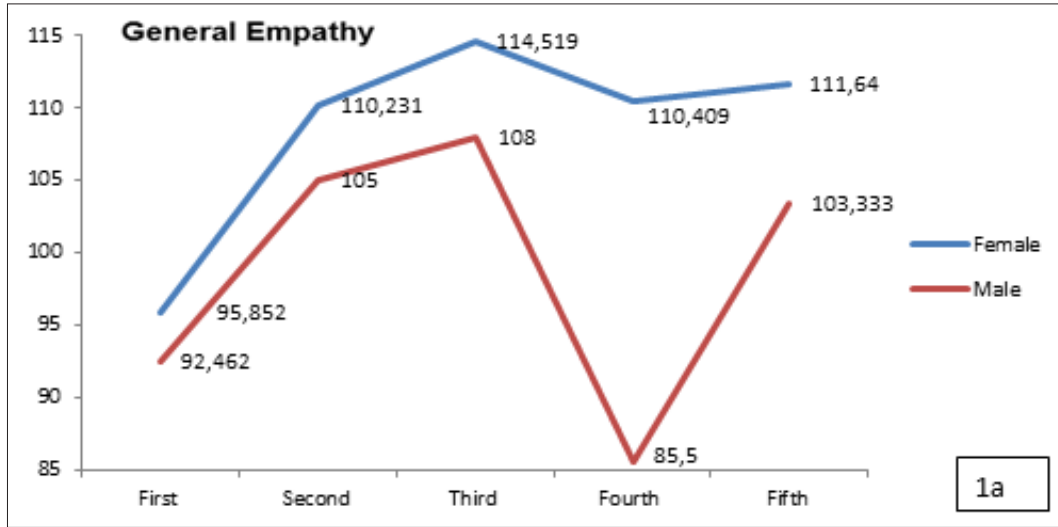
| General Empathy | F | (p) | η^2 | Power |
|---|-------|-------|----------|-------|
| Academic Year (AY) | 10,37 | 0.001 | 0.203 | 1,00 |
| Gender (G) | 18,94 | 0.001 | 0.104 | 0.991 |
| AY*G | 3,04 | 0.019 | 0.069 | 0.794 |
| Compassionate Care | | | | |
| Academic Year (AY) | 11,65 | 0.001 | 0.222 | 1.00 |
| Gender (G) | 13,56 | 0.001 | 0.077 | 0,955 |
| AY*G | 2,45 | 0.048 | 0.057 | 0.691 |
| Taking Perspective on Empathy | | | | |
| Academic Year (AY) | 5,58 | 0.001 | 0.12 | 0.976 |
| Gender (G) | 10,67 | 0.001 | 0.061 | 0.901 |
| AY*G | 2,294 | 0,062 | 0.053 | 0,66 |
| Putting oneself in other's shoes | | | | |
| Academic Year (AY) | 0,762 | 0.551 | 0.018 | 0.241 |
| Gender (G) | 2,26 | 0.135 | 0.014 | 0.321 |
| AY*G | 0,384 | 0.82 | 0.009 | 0.137 |

P = probability of committing type I error

* Interaction symbol between factors AY and G

Table 3. Results of the comparison of the answers to the empathy instrument made to the students in 2012 with respect to 2016

| | Data collection period | N | Mean | Standard deviation of the mean | Typical Error | F | t-student |
|-----|------------------------|-----|------|--------------------------------|---------------|-----------|-----------------|
| Q3 | Year 2016 | 173 | 4,05 | 1,517 | ,115 | 0,126 ns | 2,014; p=0,045 |
| | Year 2012 | 189 | 3,73 | 1,468 | ,107 | | |
| Q5 | Year 2016 | 173 | 5,84 | 1,481 | ,113 | 11,01 *** | 2,259; p=0,023 |
| | Year 2012 | 189 | 5,44 | 1,840 | ,134 | | |
| Q10 | Year 2016 | 173 | 5,92 | 1,370 | ,104 | 3,56 ns | 2,44; p=0,015 |
| | Year 2012 | 189 | 5,54 | 1,531 | ,111 | | |
| Q16 | Year 2016 | 173 | 5,74 | 1,413 | ,107 | 3,43 ns | -2,28; p=0,017 |
| | Year 2012 | 189 | 6,08 | 1,334 | ,097 | | |
| Q17 | Year 2016 | 173 | 4,39 | 1,999 | ,152 | 7,12*** | 2,502; p=0,013 |
| | Year 2012 | 189 | 4,88 | 1,753 | ,127 | | |
| Q18 | Year 2016 | 173 | 3,16 | 1,838 | ,140 | 0,77 ns | -2,062; p= 0,04 |
| | Year 2012 | 189 | 3,56 | 1,891 | ,138 | | |



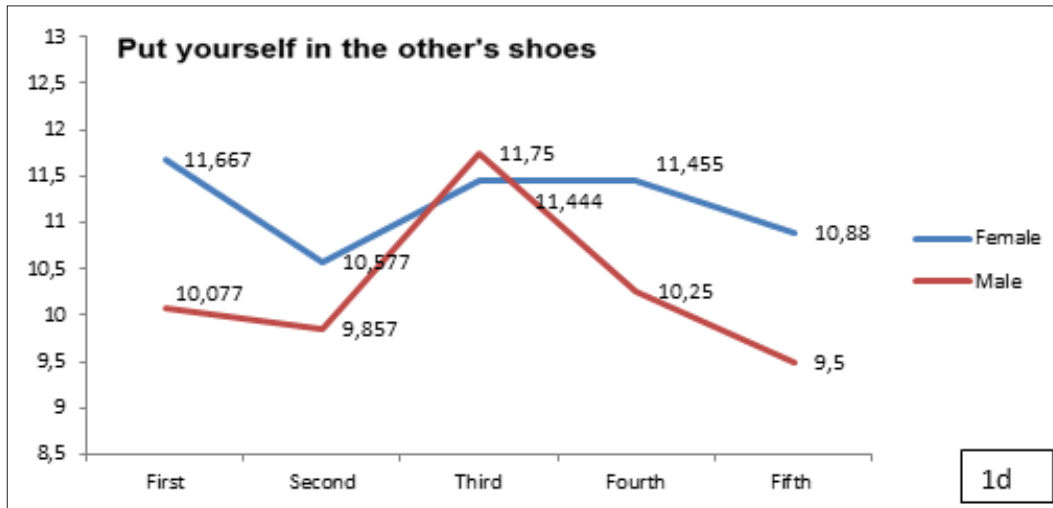


Figure 1. Distribution of the means of Empathy in General and of each of its components according to the academic year and gender.

DISCUSSION

During the genesis, development and outcome of any disease, it is of the utmost importance to develop and foster students' interpersonal abilities to face the clinical situations related to the integral assistance of patients. (11,12). Accordingly, it is essential to make a clear diagnosis of the medical students' empathic attitude and /or to assess any possible strategy aimed at increasing this attitude. The first step, in both cases, is to make a proper assessment of the data consistency and reliability in the context of a validated instrument.

The present study found a difference between males and females as to their general empathy and its components, being this difference in favor of female students, with the only exception of "Putting Yourself in Other's Shoes" in which case there was no real statistical difference. Similar results as to gender difference were described by other authors in different Latin American universities and countries (11,19-31).

These differences between genders are not always in favor of females. Some papers have described the three possibilities: a) greater in females than in males (with statistical differences); b) no statistical differences between males and females and c) males have shown more empathy than females, with statistical differences among them. Different authors in Latin America have tried to explain these results (15-25); however, this is still controversial and its elucidation is not our aim.

General Empathy and its components in both genders showed an increasing trend towards third year; they slightly decreased in fourth year and, finally, there was a general tendency to increase in fifth year, with the exception of the last component "Putting Yourself in Other's Shoes". Similar results were obtained by Rojas et al (26), Rivera et al (27) and Díaz-Narváez et al (28) in Physiotherapy and Dentistry students in Chile. They observe a constantly ascending tendency in empathy scores obtained by students from different career levels.

Erazo et al (29) and Howard et al studies (15) described that empathy increased in fourth and fifth year without any significant difference as to gender, while Bilbao et al (30) did not find any difference between gender or academic year in spite of the absolutely superior scores measured in fourth year. The present study inquired into general empathy and its components between fifth and first year students. EIPTCP got the highest score (36,84%) in the "Taking Perspective" component (general empathy levels and the other components were lower but positive, with the exception of "Putting Yourself in Other's Shoes" component. Possible consequences of PTCE positive results could be attributed to the fact that the presence of the strategy used in the disclosure of empathy had the expected results; nevertheless, this was not enough to raise empathic attitude to higher levels; and, in the case of the "Putting Yourself in Other's Shoes" component, there was a decrease. After this, empathy increased as regards "Compassionate Care" and "Taking Perspective". The first component has an emotional base and the second one has a cognitive base, as much as "Putting Yourself in Other's Shoes". Therefore, it seems that the right strategy must be aimed mainly at the development of cognitive components, since these can be taught (15, 25). Then, this strategy must be associated to a better planned intervention including a new conception of the curriculum that encompasses contact among the students and the patients from the very beginning of the career, a change in the teaching learning process which has to be active, student-centered and with the teacher showing how to treat the patient, among many other factors. (17, 19, 20),

Several papers show that there are differences in the results found among different

universities. Cultural, social, educational and economic differences are mentioned, amongst others. This fact could encourage the influence of socio-cultural factors in the acquisition of this attitude. Sherman et al (13) and Hojat et al (5,6) aim at stressing the natural characteristics of the assessed groups, the students' maturity and cultural background, their previous experience and personal development, their participation in group and social activities recognizing the importance of social and psychological factors. These differences have been found in Latin America (25). As a consequence, we must rely on a well done diagnosis of empathy before initiating any intervention in our region.

CONCLUSIONS

The present study findings show that: a) disclosure of empathy in a sustained way along the five years of the career had positive results in increasing empathy levels; b) this strategy; however, did not help to specifically develop cognitive components; c) a new strategy including the teaching of cognitive elements and stimulating the emotional ones in an integral way is necessary; d) it is necessary to make deeper studies to prove if males should receive a different training than females and e) it is necessary to include qualitative studies addressing patients and students in the clinical setting. This last point could contribute to observe the variable evolution along time, to get to know the elements that promote it and to relate them to the formative strategies that enhance the students' empathic attitude. On the other hand, this paper has a sample size limitation. The sample is finite and can not be arbitrarily increased; however, the statistical tests used in the comparisons consider the sample size in the different levels of the studied factors.

Financing: Universidad Católica de Córdoba, Argentina. Code of the Project: 80020150200082CC.

REFERENCES

1. Kane GC, Gotto JL, Mangione S, West S, Hojat M. Jefferson Scale of Patient's Perceptions of Physician Empathy: Preliminary Psychometric Data. *Croat Med J.* 2007; 48(1): 81-6.
2. Teng B, Moriarty H, Huthwaite. "Being-in-role": A teaching innovation to enhance empathic communication skills in medical students. *Med Teach.* 2011;33(12):e663-9. doi:10.3109/0142159X.2011.611193
3. Carvajal A, Miranda CI, Martinac T, García G, Cumsille F. Análisis del nivel de empatía en un curso de quinto año de medicina, a través de una escala validada para este efecto. *Rev. Hosp. Clin. Univ. Chile.* 2004;15 (4):302-6.
4. Silva MG, Arboleda J, Díaz-Narváez VP. Orientación empática en estudiantes de Medicina en una Universidad de República Dominicana. *Educ Med Super.* 2014;28(1):74-83.
5. Hojat M, Gonnella JS, Nasca TJ, Mangione S, Vergare M, Magee M. Physician Empathy: Definition, Components, Measurement, and Relationship to Gender and Specialty. *Am J of Psychiatry.* 2002; 159(9):1563-9. doi:10.1176/appi.ajp.159.9.1563
6. Hojat M, Gonnella JS, Mangione S, Nasca T.J., Magee M. Physician empathy in medical education and practice: experience with the Jefferson Scale of Physician Empathy. *Semin Integrative Med.* 2003;1:25-41.
7. Di Matteo MA, A social-psychological analysis of physician-patient rapport. Toward a science of the art of medicine. *Journal of Social Issues.* 1979;35(1):12-33. Doi: 10.1111/j.1540-4560.1979.tb00787.x
8. Schwartz B, Bohay R. Can patients help teach professionalism and empathy to dental students? Adding patient videos to a lecture course. *J Dent Educ.* 2012;76(2):174-84.
9. Moya-Albiol L, Herrero N, Bernal MC. Bases neuronales de la empatía. *Rev Neurol* 2010;50(2):89-100.
10. Mc Intyre AM. Empatía en la relación médico-paciente en atención primaria de salud (Tesis para optar al grado académico de Magister en Psicología). Santiago (Chile): Pontificia Universidad Católica de Chile; 2007.
11. Smith M, Dundes L. The Implications of Gender Stereotypes for the dentist-patient relationship. *J Dent Educ.* 2008; 72(5):5562-70.
12. Lanning KS, Ranson LS, Willett MR. Communication skills, instruction utilizing interdisciplinary peer teachers: Program development and student perceptions. *J Dent Educ.* 2008; 72(2):172-82.
13. Sherman J, Cramer A. Measurement of Changes in Empathy During Dental School. *J Dent Educ.* 2005;69(3):338-345.
14. De la Rosa-Legón M, Vega González N, Brito Gómez L. El paradigma médico social y la competencia comunicativa del profesional de ciencias médicas. *Revista Haban CiencMed.* 2010;9(3):433-440.
15. Howard M, Navarro S, Ugalde IR, Zamorano A, Díaz-Narváez VP. Medición del nivel de orientación empática en el estudiantado de la Facultad de Odontología, Universidad de Costa Rica. *Odovtos.* 2013;15:21-29.
16. Varela TB, Villalba RH, Gargantini P, Quinteros S, Villalba SB, Díaz-Narváez VP. Niveles de orientación empática de estudiantes de Odontología de la Universidad Católica de Córdoba, Argentina (UCC). *Claves de Odontología.* 2012; 70:15-22.
17. Alcorta-Garza A, González-Guerrero JF, Tavitas-Herrera SE, Rodríguez-Lara FJ, Hojat M. Validación de la Escala de Empatía Médica de Jefferson en Estudiantes de Medicina Mexicanos. *Salud Mental* 2005; 28 (5): 57-63.
18. OMS. Patient Interaction and Communication. Division of Mental Health, Publicación WHO-MNS-PSF-93. 11. Ginebra, 1993; Disponible en: <http://www.who.int/publications/>
19. Carrasco DE, Bustos A, Díaz-Narváez VP. Orientación empática en estudiantes de odontología chilenos. *Rev Estomatol Herediana.* 2012; 22(3):145-51.

20. Huberman-Casas J, Rodríguez-Hopp MP, González-Providell S, Díaz-Narváez VP. Niveles de orientación empática en estudiantes de odontología de la Universidad del Desarrollo, sede Santiago (Chile). *Rev. Clin. Periodoncia Implantol. Rehabil. Oral.* 2014; 7(3):169-74
21. Vera C. Empathetic Orientation in Dentistry student from Latin America. *Literature Review. J Oral Res.* 2014; 3(2):123-27.
22. Silva M, Arboleda Castillo J, Diaz-Narváez VP. Orientación empática en estudiantes de odontología de la Universidad Central del Este. *Odontostomatología.* 2013;15(22):24 - 33.
23. Gutierrez-Ventura F, Quezada-Huerta B, López-Pinedo M, Méndez-Vergaray J, Díaz-Narváez VP, Zamorano A et al. Medición del nivel de percepción empática de los estudiantes de la Facultad de Estomatología Roberto Beltrán. Universidad Peruana Cayetano Heredia. *Rev. Estomatol Herediana.* 2012; 22(2): 91-9.
24. Sánchez-Jiménez L, Padilla-Guevara M, Rivera I, Zamorano A, Díaz- Narváez VP. Niveles de orientación Empática en los estudiantes de odontología. *Educ Med Sup.* 2013; 27(3):216-225
25. Díaz-Narváez VP, Alonso Palacio LM, Caro SE, Silva MG, Bilbao JL. Empathic Orientation among Medical Student from three universities in Barranquilla, Colombia and one university in the Dominican Republic. *Arch Argent Pediatría.* 2014; 112(1):41-9. Doi: 10.1590/S0325-00752014000100008.
26. Rojas-Serey AM, Castañeda-Barthelemiez S, Parraguez Infiesta RA. Orientación empática de los estudiantes de dos escuelas de kinesiología de Chile. *Educ Med.* 2009;12 (2):103-109.
27. Rivera I, Arratia R, Zamorano A, Díaz-Narváez VP. Evaluación del nivel de orientación empática en alumnos de odontología. *Salud Uninorte.* 2011;27(1):63-72.
28. Díaz-Narváez VP, Salas-Alarcón DM, Bracho Milic F, Ocaranza-Ozímica J. Empatía en estudiantes de Kinesiología. Universidad Mayor, sede Temuco, Chile. *Rev Cienc Salud.* 2015;13(3):383/393. Doi:dx.doi.org/10.12804/revsalud13.03.2015.05
29. Erazo-Coronado AM, Alonso-Palacio LM, Rivera-Ugalde I, Zamorano-Arancibia A, Díaz-Narváez VP. Evaluación de la Orientación Empática en estudiantes de odontología de la Universidad Metropolitana de Barranquilla (Colombia) *Revista Científica Salud Uninorte.* 2012;28(3):354-363.
30. Bilbao JL; Iglesias JE; Díaz-Narváez VP, Crespo-Camacho E, Alonso LM,, Alcocer A. Orientación empática en estudiantes de medicina de las Universidades Libre y San Martín, Barranquilla, Colombia. Investigación original. *Rev. Fac. Med.* 2015; 63(4): 657-63.
31. Díaz-Narváez VP, Erazo-Coronado AM, Bilbao JL, González F, Padilla M, Howard M et al.. Empathy Level of Dental Student of Central America and the Caribbean. *Health.* 2015;7(12):1678-1686. Doi10.4236/health.2015.712182
32. Bullen M, Salazar L, Díaz-Narváez VP. Orientación empática en estudiantes de odontología de la Universidad de Panamá (República de Panamá). *Salud Uninorte Barranquilla(Col.).* 2015; 31(2):266-275.doi.org/10.14482/ sun.30.1.4309