

Comparing Empathy in Medical Students of two Portuguese Medicine Schools

Luiz Miguel Santiago (✉ luizmiguel.santiago@gmail.com)

University of Coimbra <https://orcid.org/0000-0002-9343-2827>

Inês Rosendo Silva

Universidade de Coimbra Faculdade de Medicina

Mona Lisa Coutinho

Universidade de Coimbra Faculdade de Medicina

Kati Maurício

Universidade de Coimbra Faculdade de Medicina

Isabel Neto

Universidade da Beira Interior Faculdade de Ciências da Saúde

José Augusto Simões

Universidade da Beira Interior Faculdade de Ciências da Saúde

Research article

Keywords: Medical Empathy, Medical Students, Doctor-Patient Relationship, JSPE, Medical Education, Student's Empathy.

Posted Date: February 27th, 2020

DOI: <https://doi.org/10.21203/rs.2.13732/v3>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Version of Record: A version of this preprint was published at BMC Medical Education on May 13th, 2020. See the published version at <https://doi.org/10.1186/s12909-020-02034-3>.

Abstract

Objectives To evaluate differences in empathy between the Integrated Master's degree in Medicine (MIM) students from the Faculty of Medicine - University of Coimbra (FMUC) and the Faculty of Health Sciences - University of Beira Interior (FCS-UBI). **Methodology** Cross-sectional observational study with the Jefferson Scale of Physician Empathy – students' Portuguese version (JSPE – spv) to 1st, 3rd and 6th year students of the 2017/2018 academic year with descriptive and inferential statistical analysis ($p < 0.05$). **Results** Size representative sample of 795 students. Higher total empathy score (TES) ($p = 0.008$) and "Perspective taking" ($p = 0.001$) in FCS-UBI were found. JSPE-TES was higher in FCS-UBI, 3rd year ($p = 0.038$). Higher FCS-UBI "Perspective taking" in the 1st year ($p = 0.030$) and 6th year ($p = 0.044$), for "Compassionate care" in the 3rd ($p = 0.019$) and for "Standing in the patient's shoes" in the 1st year ($p = 0.018$) and in FMUC for "Compassionate care" in the 1st year ($p = 0.037$) and the "Standing in the patient's shoes" in the 3rd year ($p = 0.002$) were found. Higher levels of empathy were found in FCS-UBI female students, for JSPE-TES ($p = 0.045$) and "Perspective taking" ($p = 0.001$). **Conclusion** Higher empathy levels in FCS-UBI were found, with different results in the third year suggesting influence of the medical course teaching characteristics.

Background

Empathy is paramount in the doctor-patient relationship, contributing to greater patient satisfaction with their doctor, ease in providing relevant information, adherence to therapy and clinical results, lower litigation rates for medical mal-practice and levels of stress and professional burnout¹⁻⁴.

Empathy is a comprehensive and multidimensional concept. Hojat et al. have described it as a predominantly cognitive (rather than emotional) attribute that involves the ability to understand (rather than feel) the patient's experiences, concerns, and perspectives associated with the ability to communicate that same understanding.⁵

Empathy can be taught and trained through educational processes and reflection⁶⁻⁹.

Thus, it is important to promote effective educational interventions that can improve and maintain the levels of empathy in students, physicians to be as well in practicing doctors, contributing to the strengthening of the doctor-patient relationship and to a better healthcare system^{6,8,9}.

Despite the consensus on the importance of empathy in medical education and practice⁶, a worrying decrease in the empathy of medical students throughout their years in Medical Schools is reported^{6,11-15}. A recent meta-analysis indicates significant evidence of self-ratings of empathy changing across the years of medical education only when the JSPE is used⁹.

Scarce Portuguese literature focus on the evolution of empathy in portuguese medical students. A multi-institutional study reveals that empathy and personality of medical students are closely related⁷. Cross-

cultural adaptation and validation of the Jefferson Scale of Physician Empathy – students' Portuguese version (JSPE – spv) has already been made.^{1,5,16}

There are few studies on the factors that can influence the empathy of medical students, particularly the influence of the curricular model practiced in the different Medical Schools².

This study aimed to compare the levels of empathy of medicine students of two Schools with different curricular models, allowing investigation on the differences and influences of the teaching system in student's empathy.

We compared the Faculty of Medicine of the University of Coimbra (FMUC) and the Faculty of Health Sciences of the University of Beira Interior (FCS-UBI).

To put in context, the two Medical Schools have the same admission process with most students admitted through a competitive national exam^{17,18}. More females enter both schools at an approximate 3:1 ratio. Higher marks in the national ranking exam are observed for students entering FMUC than those entering FCS-UBI. FMUC receives 350 students a year and FCS-UBI 150. In both Schools, the course is 6 years^{17,18} but the student-tutor ratio is higher at FMUC (18.5) to 3.1 FMUC and FCS-UBI respectively)^{18,19}.

FMUC's teaching is semesterial, applies a non-integrated teaching system, based on the compartmentalization of contents into subjects, emphasizes the "storage" of information^{17,19,20} and evaluations are mainly by theoretical exams. FCS-UBI has a quarterly period organization and applies an integrated teaching system promoting self-directed learning using, whenever possible, problem-based learning^{18,21}. According to European "Bologna Declaration" [https://ec.europa.eu/education/policies/higher-education/bologna-process-and-european-higher-education-area_pt accessed on the 19th December 2019] medicine students are to perform a Thesis at the end of their studies, so acquiring a Master on Medicine degree (MIM). More details on curricula information can be obtained at the Medical Schools website^{17,18,20,21}.

Analysing the curriculum of each faculty, FCS-UBI includes more content in the area of human sciences, more role-playing activities and an earlier clinical in-practice contact with patients, are required to perform^{8,22,23}.

The objectives of this study were to examine the levels of empathy recorded by medical students in FMUC and FCS-UBI and to compare them by gender and scholar year.

Methods

We performed a cross-sectional observational study applying an instrument to measure the levels of empathy of first, third and sixth-year students attending the MIM in FMUC and FCS-UBI after approval by both Directors of these two Medical Schools in Central Portugal.

The JSPE-spv, a self-administered questionnaire allowing evaluation of the student's self-perception of empathy in patient care, was used.⁵ It is considered a reliable instrument with evidence that supports its validity^{1,5,16,24,25}. With 20 items, to be answered on a Likert scale from 1 (strongly disagree) to 7 points (strongly agree) it studies three components: "Perspective taking" (10 items; refers to the ability to analyse another person's problem from the outside), "Compassionate care" (8 items, defined by the activity in favour of the one we see suffering) and "Standing in the patient's shoes" (2 items; refers to the act of thinking as if we were in the other person's place)^{5,16,24}. The total score varies from 20 to 140, and the higher the score the higher the level of empathy^{16,24}.

The sample size was calculated after the total number of students to be enrolled in each faculty in the academic year 2017/2018 per year of attendance. FMUC 471 students in the 1st year, 328 in the 3rd year and 314 in the 6th year and FCS-UBI 186 in the 1st year, 136 in the 3rd year and 141 in the 6th year. The sample size calculation was made using the site "The Survey System - Sample Size Calculator"²⁶ to represent the universe with a 95% confidence level and a 5% margin of error.

The study instrument was distributed in paper during practical classes of the first, third and sixth curricular year in both universities, in 2018 April and May. Responsible Professors for each randomly chosen class were previously informed and granted consent. The number of students to be enrolled, implied a draw of each year classes to achieve the needed sample size, with extra classes for sample collection security reasons. Student's participation was individual, voluntary, anonymous and with written informed consent. Information on gender (male / female) and MIM year (first / third / sixth) was obtained.

The SPSS®) Software for Windows version 24.0" was used for storage, descriptive and inferential statistical analysis of data. Checking the non-normality of the data distribution with the Kolmogorov-Smirnov test, non-parametric tests (Mann-Whitney test) was used for statistical analysis. A p value of <0.05 was considered for significant difference.

Results

A representative sample size of at least 286 questionnaires at FMUC and 210 at FCS-UBI was estimated. For this study a sample of 795 medical students, 420 from FMUC and 375 from FCS-UBI was studied. Its description according to the university, the MIM year attended and gender is shown in Table 1. The Kolmogorov-Smirnov test showed no numeric data with normal distribution ($p < 0.001$). Using the chi-square test and the Mann-Whitney U test, no significant differences were found between universities for gender ($p = 0.096$) and year of MIM ($p = 0.408$).

Table 2 shows the differences in the mean value of the answers scores between universities for total JSPE and each one of its components ("Perspective taking," "Compassionate care", "Standing in the patient's shoes").

With the Mann-Whitney U test statistically significant higher total empathy TES and "Perspective taking" scores were found in FCS-UBI; respectively $p=0.008$ and $p=0.001$.

Table 3 reveals the mean value of the responses per Medical School and per year of MIM for the total JSPE and for each of its components per year between Scholls ("Perspective taking", "Compassionate care", "Standing in the patient's shoes") and for gender, again with Mann-Whitney U test. There was significant difference in the 3rd year ($p=0.038$), higher score in the FCS-UBI.

For "Perspective taking" there were significant differences in the 1st ($p=0.030$) and in the 6th year ($p=0.044$), both scores being higher in the FCS-UBI.

For the "Compassionate care" component, there was a difference in the 1st year ($p=0.037$), and in the 3rd year with higher scores in the FCS-UBI ($p=0.019$).

Regarding the "Standing in the patient's shoes" component, significant differences were found in the 1st year ($p=0.018$), FCS-UBI scoring better, and in the 3rd year ($p=0.002$) higher at the FMUC.

By gender between universities for total JSPE and for each of its components there was a statistically significant difference, better for female students, for the total JSPE score ($p=0.045$) and the "Perspective taking" score ($p=0.001$), again with a higher score in FCS-UBI.

Discussion

Compared to FMUC students, overall those in FCS-UBI recorded significantly higher JSPE total scores and Perspective Taking scores and FCS-UBI Year 3 students recorded significantly higher scores for Compassionate Care.

These results are in line with the only study we found comparing the levels of empathy in two universities with different curricular models in a Pakistan study.²⁷ Another multi-institutional study revealed the influences of teaching scheme on the levels of medical students empathy though no specification of curricular model was reported²⁸. Given the different socio-economic environments and medical and educational contexts between Portugal and Pakistan we can only recognise that Portuguese medicine students appear to be less empathic, the reasons for such being speculative.

Lower levels of empathy in FMUC students can possibly be explained by:

Teaching characteristics of each school.

FCS-UBI curriculum provides in-practice classes with the student accompanied by skilled tutor together with practical sessions following a theoretical tutorial.

Analysing the curricula of both University Medical schools^{17,18} FCS-UBI had a larger number of curricular units related to humanistic sciences, with emphasis on the development of interaction and communication skills. Role-playing activities are conducted regularly with discussion and specific assessment of students' communicative and empathic abilities is made^{8,22,23}. FMUC lacks subjects related to the humanistic sciences and has a more superficial and limited approach to clinical practice started in the 4th year of MIM. The curricular unit of General Practice/Family Medicine, is the only one to include the discussion of topics such as empathy and communication and the performance of role-playing activities, is only taught in the 5th year. So by the 3rd year, FCS-UBI students already have had contact with clinical practice, whereas FMUC students have not^{17,18}. Tutor's characteristics influence the levels of student's empathy^{15,22}. Thus, the differences between the two universities can also be so explained, and that deserves future study, supporting interventions in their tutors, upgrading them.

Other secondary factors can also help explain different levels of empathy:

Student-tutor ratio FMUC with a ratio of 18.5 (Portuguese average 7.53), contrasting with a 3.1 ratio in FCS-UBI. Higher student-tutor ratio at FMUC contributed to lower satisfaction with teaching, less clinical contact and less opportunities to develop empathic relationships with patients¹⁹. Author data affirm the need of adequate role-models for empathy.

In fact in Coimbra students have a 13 European Credit Transfer and Accumulation System (ECTS) content in General Practice at the 1st year, 6 hours, 5th year one semester and 6th year two months with a dedicated General Practice tutor, in their curriculum, comparing to 30 ECST in FCS-UBI, 1st, 2nd, 4th, 5th and 6th years and do most of their in-practice cases in a large over-crowded Central Hospital^{17,18,20,21}. The impact of this difference deserves future studies comparing with the structure of medical tutors.

Student's satisfaction: A student's opinions pool, found out that FMUC was the national Medical school with the worst level of overall satisfaction and clinical teaching and study conditions, whereas FCS-UBI had the highest levels²⁹.

So far no studies in specific students characteristics were performed to differentiate between FMUC and FCS-UBI except for entry marks, higher in Coimbra. Significant differences were only found in feminine gender and only in the total JSPE score and in the "Perspective taking" component, being higher in FCS-UBI, female students of FCS-UBI had higher levels of empathy than male ones.

Empathy is positively influenced by quality of life and negatively by fatigue, stress, and burnout for studies carried out in both universities that partook in this study showed that, FCS-UBI students have a better quality of life and are less vulnerable to stress and fatigue^{29,30}.

The existence of differences in empathy between the two universities supports the need to consider the impact of the curriculum model and other MIM characteristics on the development of the empathic capacities of medical students. So several changes can be considered in order to increase the levels of

empathy in medical students, in the long term, in order to improve and maintain the levels of empathy in medical students:

Educational interventions focused on empathic capacities by role-playing, video-watching and real consultations with patients with analysis and discussion of medical communication is deemed necessary²³. Also lectures and practice of the importance of empathy and communication in the doctor-patient relationship and early integration of more contents of the human sciences area into the study plan, with a more reduced student-tutor ratio, preferably a one to one even if for shorter period of time^{8,9}. Even though “empathy is related to personality”, a matter this study did not focus on³¹.

Thus, the differences between the two universities are, in part, explained. However future study is needed to support interventions.

Other secondary factors can also help explain different levels of empathy in spite of the attempts to minimize bias. There may have been distraction in reading the questionnaires. Attempts were made to close the selection bias through the random selection of the classes included in the study. The JSPE student’s version evaluates self-perception of empathy, which may be different from the actual empathic behaviour.

As practice points from our study we must emphasize that (1) Empathy is a paramount element of the doctor-patient relationship, can be trained through an educational process, (2) student’s empathy levels were higher when more precocious contact with patients was developed and (3) reassessment of curricular particularities must bare in mind practical activities in real world context, bearing the intrinsic characteristics of the student’s population.

Conclusion

The levels of empathy of FCS-UBI medical students were higher than those found in FMUC students.

Comparing the results per year of MIM, the difference was mainly in the 3rd year with better results in FCS-UBI.

By gender females score statistically different between the two Schools, better in FCS-UBI.

The results support the need to reassess the learning curriculum and the teaching context, with the objective of promoting effective educational interventions in the development of student empathy.

List Of Abbreviations

MIM: Integrated Master’s degree in Medicine

FMUC: Faculty of Medicine of the University of Coimbra

FCS-UBI: Faculty of Health Sciences of the University of Beira Interior

JSPE – spv: Jefferson Scale of Physician Empathy – students’ Portuguese version

TES: total empathy score

ECTS: European Credit Transfer and Accumulation System

Declarations

Ethics approval and consent to participate.

This study has had an ethics committee approval, by the “Comissão de Ética da ARS-C”. For approval a consent document was presented and approved.

All data were obtained after written informed "Consent to participate" and for data to be analysed.

Consent for publication:

Not applicable

Availability of data and materials

All data will become available if requested from a SPSS file at request.

Competing Interests:

None of the authors states competing interests.

Fundings:

No funding were obtained for this study which was been made in out of authors working job hours.

Authors Contributions:

LMS: Conception of work, data gathering, data analysis, manuscript writing, scientific revision and approval

IRS: Conception of work, data analysis, manuscript writing and manuscript scientific revision and approval.

MLC: Conception of work, data analysis and manuscript writing, scientific revision and approval

KM: English translation, manuscript scientific revision and approval.

IN: Data gathering, manuscript scientific revision and approval.

Acknowledgements: No acknowledgements are to be made.

References

1. Loureiro J, Goncalves-Pereira M, Trancas B, Caldas-De-Almeida JM, Castro-Caldas A. [Empathy in the doctor-patient relationship as viewed by first-year medical students: data on validity and sensibility to change of the Jefferson Measure in Portugal]. *Acta Med. Port.* 2011;24:431-442. Portuguese.
2. Hegazi I and Wilson I. Maintaining empathy in medical school: It is possible. *Med Tech.* 2013;35(12):1002-1008.
3. Kim S, Kaplowitz S, Johnston M. The Effects of Physician Empathy on Patient Satisfaction and Compliance. *Eval Health Prof.* 2004;27(3):237-251.
4. von Harscher H, Desmarais N, Dollinger R, Grossman S and Aldana S. The impact of empathy on burnout in medical students: new findings. *Psychology, Health & Medicine.* 2017;23(3):295-303.
5. Hojat M, Vergare MJ, Maxwell K, et al. The devil is in the third year: a longitudinal study of erosion of empathy in medical school. *Acad. Med.* 2009;84(9):1182-1191.
6. Costa P, Alves R, Neto I, Marvao P, Portela M, Costa MJ. Associations between medical student empathy and personality: A multi-institutional study. *PLoS One.* 2014;9(3):1-7.
7. Hojat M, Axelrod D, Spandorfer J, Mangione S. Enhancing and sustaining empathy in medical students. *Med Teach.* 2013;35(12):996-1001.
8. Magalhães E, DeChamplain A, Salgueira A, Costa MJ. Empatia Médica: Adaptação e Validação de uma Escala para Estudantes de Medicina. Livro de Actas do VII Simpósio Nacional de Investigação em Psicologia, 2010 Feb 4-6; Braga, Portugal. 2010;77-89. Portuguese.
9. Spatoula V, Panagopoulou E, Montgomery A. Does empathy change during undergraduate medical education? - A meta-analysis*, *Med Teach.* 2019; 41(8):895-904. doi: 10.1080/0142159X.2019.1584275. Epub 2019 May 7 2004 Mar;17(1):73-84.
10. Machado A. A empatia médica na ótica dos estudantes de medicina [Medical empathy in the eyes of medical students] [dissertation]. Coimbra (Portugal): Universidade de Coimbra; 2016. Portuguese.
11. Park K, Roh H, Suh D and Hojat M. Empathy in Korean medical students: Findings from a nationwide survey. *Med Teach.* 2014;37(10):943-948.
12. Chen D, Lew R, Hershman W, Orlander J. A Cross-sectional Measurement of Medical Student Empathy *Journal of General Internal Medicine.* 2007;22(10):1434-1438.
13. Youssef F, Nunes P, As B, Williams S. An exploration of changes in cognitive and emotional empathy among medical students in the Caribbean. *Int J Med Educ.* 2014;5:185-92.
14. Neumann M, Edelhauser F, Tauschel D, et al. Empathy Decline and Its Reasons: A Systematic Review of Studies With Medical Students and Residents. *Acad. Med.* 2011;86(8):996-1009.

15. Aguiar P, Salgueira A, Frada T, Costa MJ. Empatia Médica: Tradução, Validação e Aplicação de um Instrumento de Medição. Actas do X Congresso Internacional Galego-Português de Psicopedagogia, 2009 Sep 9-11; Braga, Portugal. 2009;3705-3716. Portuguese.
16. University of Coimbra. Faculty of Medicine. Integrated Master's degree in Medicine [Internet]. Coimbra(PT): Universidade de Coimbra; [2018; cited 2019 Jan 20]. Available from <https://apps.uc.pt/courses/en/course/5841>.
17. University of Beira Interior. Medicine. Integrated Master Degree [Internet]. Covilhã(PT): Departamento de Ciências Médicas; [2014; cited 2019 Jan 20]. Available from <http://www.ubi.pt/en/course/52>.
18. Grilo D, Moreira M, Coimbra A, et al. [Study on Portuguese Medical Schools' Learning Conditions: A National Analysis on Student Satisfaction, Student-Tutor Ratios and Number of Admissions]. Acta Med Port. 2016;29(5):301-309. Portuguese.
19. University of Coimbra. Faculty of Medicine. Integrated Master's degree in Medicine. Study Programme [Internet]. Coimbra(PT): Universidade de Coimbra; [2018; cited 2019 Jan 20]. Available from https://apps.uc.pt/courses/en/programme/5841/2018-2019?id_branch%20=16221.
20. University of Beira Interior. Integrated Masters in Medicine. Study Plan [Internet]. Covilhã(PT): Departamento de Ciências Médicas; [2019; cited 2019 Jan 20]. Available from <https://www.ubi.pt/en/studyplan/52/1595/2019/>.
21. Ahrweiler F, Neumann M, Goldblatt H, Hahn E, Scheffer C. Determinants of physician empathy during medical education: hypothetical conclusions from an exploratory qualitative survey of practicing physicians. BMC Medical Education. 2014;14:122.
22. Quince T, Thiemann P, Benson J, Hyde S. Undergraduate medical students' empathy: current perspectives. Adv Med Educ Pract. 2016;7:443-455.
23. Hojat M, Mangione S, Nasca TJ, Cohen MJM, Gonnella JS, Erdmann JB. The Jefferson Scale of Physician Empathy: development and preliminary psychometric data. Educational and Psychological Measurement. 2011;61(2):349-65.
24. Hojat M, Gonnella J. Eleven Years of Data on the Jefferson Scale of Empathy- Medical Student Version (JSE-S): Proxy Norm Data and Tentative Cutoff Scores. Medical Principles and Practice. 2015;24(4):344-50.
25. Creative Research Systems. The Survey System. Sample Size Calculator [Internet]. Sebastopol(CA): Creative Research Systems; [2012; cited 2018 Feb 2]. Available from <https://www.surveysystem.com/sscalc.htm>.
26. Ayub A, Khan RA. Measuring empathy of medical students studying different curricula; a causal comparative study. J Pak Med Assoc. 2017;67:1238-1241.
27. Quince TA, Kinnersley P, Hales J, et al. Empathy among undergraduate medical students: A multi-centre cross-sectional comparison of students beginning and approaching the end of their course. BMC Med Educ. 2016;16:92.
28. Pereira APM. Qualidade de vida e vulnerabilidade ao stress nos estudantes de medicina do 5º e 6º ano [Quality of Life and Vulnerability to Stress in 5th and 6th Year Medical Students]. [dissertation].

Coimbra (Portugal): Universidade de Coimbra; 2016. Portuguese.

29. Felizardo MGG, Santiago LM. [Quality of Life and Stress Vulnerability in Students of the 6th Year of the FCS-UBI MIM]. *RevADSO*. 2019;7(9):16-26. Portuguese.

Tables

Due to technical limitations the Tables are available as a download in the Supplemental Files.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Tables.pdf](#)