

Learning climate and self-perception of empathy in a teaching hospital's medical residency programs: a cross-sectional study

Mariel N. Mandel^a, Sergio Terrasa^a, Eduardo Durante^{a,b}

ABSTRACT

In order to explore whether there is a correlation between the learning climate (LC) and the self-perception of empathy by medical residents, we conducted an observational, cross-sectional study in a teaching hospital using the D-RECT (Dutch Residency Educational Climate Test) and the Jefferson scale (empathy) in 140 residents from 9 specialties during 2019 and 2020.

We documented a low to moderate and statistically significant correlation (Spearman's Rho: 0.34, $p < 0.0001$) between both scores, with an acceptable reliability for both instruments (> 0.7). For every 10-point difference in the D-RECT scale, an average difference of 1.80 points in the Jefferson Scale was observed. This study provides new evidence regarding the correlation between the learning climate and self-perceived medical empathy during the residency program. Our findings suggest a trend that should be further studied in the future.

Key words: medical education, internship and residency, empathy.

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- a. Family and Community Medicine Service of Hospital Italiano de Buenos Aires, City of Buenos Aires, Argentina.
- b. Research Center in Education for Health Care Providers, Instituto Universitario Hospital Italiano de Buenos Aires, City of Buenos Aires, Argentina.

E-mail address:
Mariel N. Mandel:
mariel.mandel@hospitalitaliano.org.ar

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INTRODUCTION

"Learning climate" refers to the way in which the educational environment is perceived or experienced by students.¹ This environment comprises not only the physical facilities, but also the contexts and cultures in which students learn, including interactions with their peers and teachers, as well as the organization of educational activities (curriculum).

In relation to health professions education, there is evidence that a poor learning climate is associated with poorer health outcomes for their patients² and that a poor climate is associated with greater burnout syndrome among medical residents.³

Empathy is the competence of a health care provider to understand their patient's situation, perspective, and feelings, to communicate that understanding to the patient, and to act on that understanding in a helpful therapeutic way.⁴

It is worth noting that an empathic skill can be taught and that there is sufficient evidence that empathic communication is associated with increased patient satisfaction and adherence,⁵ less patient anxiety and distress,⁶ more efficient diagnostic processes, and better clinical outcomes.⁷

Having defined these concepts, we note that, in the past decade, authors such as Brazeau⁸ and Lases⁹ documented a certain correlation between the learning climate and self-perception of empathy, especially among medical students. The interpretation of these findings suggests that a good learning climate could strengthen the empathic

characteristics of professionals in training, which in a recursive manner could also contribute to a better learning climate.

Since no local data are available and no studies have been conducted in medical residents, we consider it relevant to explore the correlation between the learning climate and the self-perception of empathy among residents. Given that an empathic skill can be trained and that the learning climate is amenable to improvement interventions, this information will provide input for designing strategies to improve the training of our residents and thus optimize population health care.

OBJECTIVES

Primary

To describe the characteristics of the learning climate and the self-perception of empathy among medical residents of a teaching hospital, according to the type of specialty.

To explore whether there is a correlation between the learning climate in the clinical department where they are being trained and their self-perception of empathy.

Secondary

To estimate the independent burden of the resident's sex, partner status, year of residency program, and type of specialty they are pursuing in relation to their association with self-perceived empathy.

POPULATION AND METHODS

Design: observational, cross sectional study.

Study setting: medical residency programs of a private teaching hospital.

Participants: medical residents (first to fifth year) from different medical specialties who were invited to complete a questionnaire between October and December 2019.

Eligibility criteria: all medical residents who, at the time of completing the questionnaire, had completed at least 1 month of residency in the department which was the subject matter of learning climate questions were considered eligible. Given the residency program calendar in Argentina, we chose October and November as optimal times for the administration of the questionnaires in our hospital, since each year of residency ended, at that time, during the first working day of June (e.g., passing from the second to the third year of the residency program).

Data collection: in the first instance, the heads

of each clinical division or department were contacted and, through them, the coordinators of each residency program, the residents according to their specialty, and the department on which their training program depended.

We invited medical residents to complete the Jefferson Scale of Empathy for Health Professionals (JSE-HP)¹⁰ and the Dutch Residency Educational Climate Test (D-RECT).² In addition, we collected demographic data: age, sex, whether or not they had a partner, year of residency program, medical specialty corresponding to the residency in which they were training.

The JSE-HP was developed by Hojat et al., to assess the perception that health professionals have regarding their empathic skill.

It includes 20 items containing a Likert-like scale with a score from 1 to 7, with the highest possible score being 140. Higher scores indicate a higher self-perception of empathy. It has been validated in Spanish in Argentina by Doval et al., in a population of cardiologists¹¹ and later applied by Granel et al.,¹² in a population from different medical specialties.

The D-RECT is an instrument validated in Spanish to measure the quality of the learning climate. It has 50 items operationalized with a 5-point Likert scale with a maximum score of 250. It comprises the following domains: supervision, coaching and guidance; training; assessment; feedback; peer collaboration; teamwork; professional relationships, etc. The D-RECT questionnaire was translated into Argentinean Spanish, cross-culturally adapted, and recently validated by a team in which one of our researchers worked.¹³

Sample size estimation: the results of a study carried out in our hospital were taken as a reference,³ which had documented a moderate correlation (correlation coefficient [r] = 0.4) between the learning climate and the level of depersonalization. In order to have a power of 90% and an alpha error of 0.05 to detect a correlation between the learning climate score and a somewhat lower self-perception of empathy (r = 0.35) than that mentioned, a sample of at least 82 participants would be necessary.

Statistical analysis

In the first stage, the resulting information was tabulated and summarized according to the type of variable that represented it.

In a second stage, the statistical correlation between both scores (learning climate and self-

perception of empathy) was explored graphically. When a pattern suggesting a correlation was observed, it was assessed using Spearman's statistical test.

In a third stage, a multivariate analysis was done to measure the independent weight in relation to the self-perception of empathy of the following variables: year of residency program (first year of residency versus the rest), sex, partner status (with or without a stable partner), and type of specialty.

This last domain was modeled through 2 conceptualizations: 1) that proposed by C. Park et al.,¹⁴ which divides specialties into 2 broad categories (people-oriented versus technique/technology-oriented) using a linear regression technique; 2) that proposed by Lases,⁹ which states that the learning climate has a behavior that can be modeled by interpreting each specialty (department/service/division) as a cluster with its own climate beyond the overall climate of the institution, using generalized estimating equations with robust treatment of variances and assuming an interchangeable matrix of correlations.

Procedures to ensure the ethical aspects of the study

This study did not involve interventions that would put the health of participants at risk because collected information was managed confidentially by the research team and kept under a password known only to the principal investigator.

The entire research study was conducted in accordance with the recommendations of the Guide for Research in Human Health published by the National Ministry of Health, the regulatory framework of the City of Buenos Aires (Law no. 3301 for the Protection of the Rights of Health Research Subjects), and the corresponding national regulations for Personal Data Protection (Law no. 25326).

In addition, participants gave their informed consent to participate after the following explanations: 1) the purpose of the research; 2) that completing the questionnaire would take 30–40 minutes; 3) that as participants they would not benefit from the results of this study, but our educational community would; 4) that their participation was voluntary and that they would not receive any compensation or penalty for participating or not; 5) that their answers would be treated confidentially.

Given that completing the questionnaire assumed an active participation, it was assumed that, after having read the informed consent form, whoever began to complete it would be giving consent to participate.

The study protocol was approved under no. 4079 by the Research Protocol Ethics Committee of Hospital Italiano de Buenos Aires

RESULTS

Of the 335 residents in our hospital, 140 (42%) from a total of nine medical specialties participated in the study. Their demographic characteristics are described in *Table 1*.

Figure 1 shows the confounding structure representing the potential causal link between learning climate and self-perception of empathy for the study population.

Description of the learning climate and the self-perception of empathy in the sample

Table 2 shows the total and partial results (according to type of specialty) of the scores obtained in the JSE-HP and D-RECT.

The median JSE-HP score in technique/technology-oriented specialties (anesthesiology, general surgery, obstetrics, traumatology and orthopedics, intensive care) was 114 (IQR: 103–122), while those in people-oriented specialties (clinical, family medicine, pediatrics, psychiatry) was 119 (IQR: 109–128).

The median D-RECT score in technique/technology-oriented specialties (anesthesiology, general surgery, obstetrics, traumatology and orthopedics, intensive care) was 169 (IQR: 153–184), while those in people-oriented specialties (clinical, family medicine, pediatrics, psychiatry) was 191 (IQR: 177–205).

As shown in *Figure 2*, a statistically significant and low to moderate correlation (Spearman's Rho: 0.34, $p < 0.0001$) was observed between the overall scores for the JSE-HP and the D-RECT.

Out of the 3 sub-scales comprising the score for the JSE-HP, none had a particularly higher correlation with the D-RECT score than the other 2: *Perspective taking* (Spearman's Rho: 0.3, $p < 0.0002$), *Compassionate care* (0.27, $p = 0.0007$), and *Standing in the patient's shoes* (0.21, $p = 0.0094$).

Table 3 shows that, regardless of the year of residency program, type of specialty, sex, and partner status, for every 10-point difference in the D-RECT, an average difference close to 1.80 points was evident in the JSE-HP.

Although both modeling strategies resulted

125), while the median D-RECT score was 180 (IQR: 158–196); no significant differences were observed between people- and technique-oriented specialties. In addition, a statistically significant and moderate correlation (Spearman's Rho: 0.34, $p < 0.0001$) between both scores was observed.

Among the limitations of the methodology used, it is worth mentioning that the D-RECT questionnaire contains 50 items and the Jefferson questionnaire another 20; this implied a great effort by interviewed participants and could have conditioned a deficient willingness to complete it in a reflexive manner. It is also worth

noting that there is an abridged version of this questionnaire that includes 35 items¹⁵ divided into domains (the original has 11 domains) which, at the time our study started, did not have a validated version in Spanish. Only in 2019, the results of the Spanish validation of the abridged scale were published in Colombia by Domínguez et al.¹⁶

In addition, our sample was not randomly selected, but was composed of the 140 residents from the 9 departments of a single teaching hospital who accepted the invitation to participate in our study. Therefore, we cannot rule out the

TABLE 2. Description of scores for the Jefferson Scale of self-perception of empathy and the perception of learning climate ($n = 140$)

Scale	Domain	Type of medical specialty		Overall (IQR)
		Person-oriented (IQR)	Technique-oriented (IQR)	
Jefferson self-perception of empathy	Perspective taking	59 (54–64)	59 (52–63)	59 (53–63)
	Compassionate care	50 (44–53)	45 (41–50)	47 (42–52)
	Standing in the patient's shoes	11 (9–13)	10 (8–13)	11 (9–13)
	TOTAL	119 (109–128)	114 (103–122)	116 (105–125)
D-RECT for learning climate perception	Supervision	12 (10–13)	11 (9–12)	11 (10–12)
	Performance assessment	29 (26–31)	26 (22–30)	28 (23–31)
	Feedback	9 (7–11)	7 (5–9)	7.5 (6–10)
	Teamwork	16 (14–18)	15 (11–17)	15 (13–17)
	Peer collaboration	14 (12–15)	13 (12–14)	13 (12–15)
	Professional relationships	12 (9–13)	10 (8–12)	11 (9–12)
	Work adapted to skills	16 (14–17)	15 (13–17)	15.5 (14–17)
	Role of the tutors	32 (30–36)	29 (25–33)	31 (26.5–34)
	Formal education	16 (14–17)	14 (12–16)	15 (13–17)
	Role of the specialty tutor	22 (19–24)	19 (16–21)	20 (16–23)
	Information at patient sign out	15 (13–18)	13 (12–15)	14 (12–16)
	TOTAL	191 (177–205)	169 (153–184)	180 (158–196)

IQR: interquartile range. D-RECT: Dutch Residency Educational Climate Test.

FIGURE 2. Statistical correlation (raw analysis) between the scores for the empathy self-perception scale (Jefferson) and the learning climate during residency test (D-RECT). The correlation was moderate (Spearman's Rho: 0.34, $p < 0.0001$)

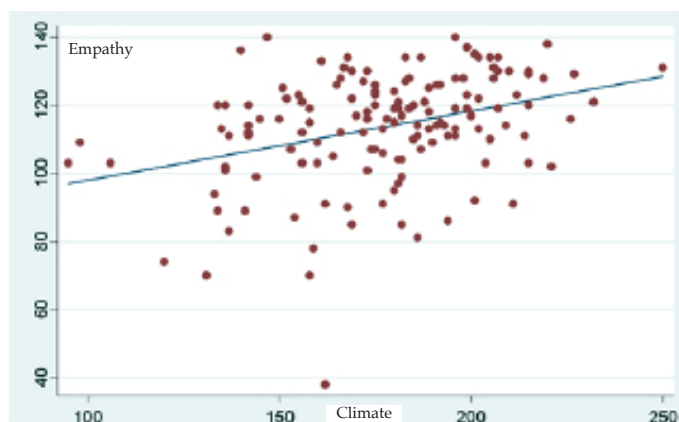


TABLE 3. Documented associations between resident's sex, partner status, type of specialty, and year of residency and self-perception of empathy

Variable	Raw association		Associations adjusted for two ways of modeling the potential influence of the specialty			
	Beta coefficient (95% CI)	<i>p</i>	Beta coefficient (95% CI)	<i>p</i>	Beta coefficient (95% CI)	<i>p</i>
Female (versus male)	7.50 (2.0–12.1)	0.007	6.6 (0.9–12.3)	0.023	7.7 (2.4–9.1)	0.001
Having a partner (versus single)	-2.4 (-8.1–3.3)	0.4	-1.6 (-6.9–3.7)	0.56	-0.74 (-3.5–2.0)	0.6
First year of residency (versus any other year)	7.9 (1.9–13.9)	0.01	2.6 (-3.7–9)	0.41	3.8 (-1.4–9.0)	0.15
Person-oriented specialty (versus technique-oriented)	6.5 (1.1–12)	0.019	0.3 (-5.8–6.4)	0.92	NA	
Every 10-point difference (D-RECT)	2.1 (1.1–3.1)	< 0.001	1.8 (0.7–2.9)	0.001	1.7 (0.6–2.9)	0.003

^a As per the proposal by Lases et al.

^b As per the proposal by Park et al.

CI: confidence interval.

NA: not applicable.

D-RECT: Dutch Residency Educational Climate Test.

possibility that a hospital department with a worse-than-average work environment was not represented in our sample. Also, our findings cannot be generalized because the study was conducted at a single site.

Given that the association we documented between the learning climate score and the self-perception of empathy score was low to moderate, our results may be interpreted as being partially consistent with those of the study recently published by Lases et al.⁹ Although that had not been the primary objective of those authors, they documented an absence of statistical association between the learning climate and the self-perception of empathy.

Further longitudinal studies that can document a causal influence will be required to consider the implementation of programs aimed at improving the learning climate in institutions where residents are trained with the goal of improving their empathy with patients.

CONCLUSION

Given the cross-sectional design of this study, it is not possible to argue for a causal

influence between the learning climate and the self-perception of empathy. However, this study provides new evidence regarding the correlation between the learning climate and self-perceived medical empathy during the residency program. Although such correlation appears to be modest, our findings suggest a trend that should be further studied in the future. ■

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