Review Article

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Empathy in medical education: a conceptual review of modulating factors across training

Empatia na educação médica: uma revisão conceitual dos fatores moduladores ao longo do treinamento

Empatía en la educación médica: una revisión conceptual de los factores moduladores a lo largo de la formación

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ABSTRACT:

Introduction: Empathy is a core competence in medical education and a predictor of patient satisfaction, adherence, diagnostic accuracy, and overall clinical outcomes. Despite its importance, evidence consistently shows a decline in empathy during medical training, especially during

clinical years. **Objective:** This conceptual review synthesizes theoretical and empirical perspectives on five major modulating factors of empathy among medical students: gender, stress and burnout, socioeconomic context, social support, and progression through medical school. **Method:** We followed the criteria proposed by the SANRA scale to maintain the study's quality. **Discussion:** Drawing on key international studies, we discuss the dynamic and fragile nature of empathy, the controversies surrounding its measurement, and the role of psychosocial and environmental determinants. **Conclusion:** We conclude by proposing a conceptual model that integrates these determinants and emphasizes the need for institutional strategies to sustain empathy throughout medical training.

Keywords: empathy; medical; students; education

RESUMO:
Introdução: A empatia é uma competência central na educação médica e um preditor da satisfação do paciente, da adesão ao tratamento, da precisão diagnóstica e dos desfechos clínicos gerais. Apesar de sua importância, evidências mostram de forma consistente um declínio da empatia durante a formação médica, especialmente nos anos clínicos. **Objetivo:** Esta revisão conceitual sintetiza perspectivas teóricas e empíricas sobre cinco principais fatores moduladores da empatia entre estudantes de medicina: gênero, estresse e *burnout*, contexto socioeconômico, apoio social e progressão ao longo do curso de medicina. **Método:** Seguimos os critérios propostos pela escala SANRA para manter a qualidade do estudo. **Discussão:** Com base em estudos internacionais relevantes, discutimos a natureza dinâmica e frágil da empatia, as controvérsias em torno de sua mensuração e o papel dos determinantes psicossociais e ambientais. **Conclusão:** Concluímos propondo um modelo conceitual que integra esses determinantes e enfatiza a necessidade de estratégias institucionais para sustentar a empatia ao longo da formação médica.

Palavras-chave: empatia, medicina, estudantes, educação

RESUMEN:
Introducción: La empatía es una competencia central en la educación médica y un predictor de la satisfacción del paciente, la adherencia al tratamiento, la precisión diagnóstica y los resultados clínicos generales. A pesar de su importancia, la evidencia muestra de forma consistente una

disminución de la empatía durante la formación médica, especialmente en los años clínicos. **Objetivo:** Esta revisión conceptual sintetiza perspectivas teóricas y empíricas sobre cinco principales factores moduladores de la empatía entre estudiantes de medicina: género, estrés y burnout, contexto socioeconómico, apoyo social y progresión a lo largo de la carrera de medicina. **Método:** Para mantener la calidad del estudio, seguimos los criterios propuestos por la escala SANRA. **Discusión:** Basándonos en estudios internacionales relevantes, discutimos la naturaleza dinámica y frágil de la empatía, las controversias en torno a su medición y el papel de los determinantes psicosociales y ambientales. **Conclusión:** Concluimos proponiendo un modelo conceptual que integra estos determinantes y enfatiza la necesidad de estrategias institucionales para sostener la empatía a lo largo de la formación médica.

Palavras clave: empatía, medicina, estudiantes, educación

Introduction

Empathy, in its most fundamental sense, represents the intrinsic capacity to respond to and share the emotional experiences of others. This evolutionary pillar supports human sociability and the intricate structure of group interactions. It is not merely a simple sympathy or a cold recognition of another's state, but a process involving affective resonance and the cognitive understanding of others' emotions, beliefs, and intentions and it’s essential for the maintainance of the societies that humans have evolved to live in [1].

Learned Matching models suggest that the matching mechanism that enables emotional resonance, a prerequisite for empathy, is constructed throughout individual development through associative learning experiences and social interactions [2]. This perspective highlights that empathy, although it may have biological predispositions, is fundamentally a product of interaction and experience.

Empathy's relevance extends beyond the social and ethical domains, exerting a decisive impact on the healthcare environment [3]. In the context of medical training, empathy elevates from a mere personality trait to an essential professional competency and an educational objective. A physician's empathic capacity has been shown to positively influence patient adherence to treatment, diagnostic accuracy, patient satisfaction, and ultimately, clinical outcomes [3, 4, 5]. For this reason, the preservation and cultivation of empathy are considered key indicators of quality in

medical education, being the target of numerous curricular and extracurricular programs [2].

In this regard, the investigation into the trajectory of empathy in medical students reveals a predominant tendency towards decline through the training years [3, 6, 7, 8]. This pattern, consistently observed after the third year, coincides with the entry into the clinical environment [3]. The vulnerability of empathy in medical training is not an isolated phenomenon, but rather a symptom of the workload and exposure to academic and clinical stressors [9].

Given the relevance of empathy for medicine and its demonstrated decline throughout the training process, the identification and understanding of the factors that modulate its levels in medical students has become a research area of utmost urgency. The present study is situated within this context, aiming to investigate and analyze the main variables that, according to international literature, significantly influence the expression and maintenance of empathy in this population.

Objectives

By conducting this narrative review, we aimed to synthesize the current knowledge on empathy among medical students, centering our search on the main variants playing a role in the development and/or loss of empathy among this population, while addressing the following questions:

1. What role do the following variants play in empathy among these populations?
    - Gender
    - Stress and/or burnout
    - Income
    - Social Support
    - Medical. School year

2. Does empathy increase or decrease throughout medical school?

Materials and Methods

Narrative review method

Narrative review is a broad term used for the review process in which the researchers can seek a larger description and interpretation of previously articles.

It provides a flexible, yet rigorous, approach to analyzing and interpreting the literature [10].

Narrative reviews are diverse, with individual purposes and processes, being a more flexible review method that can be adapted to fit the author's goals and style, involving five key steps: searching, screening, sampling and analysis.

Although there is no methodology guide for narrative reviews, we followed the criteria proposed by the SANRA scale to maintain the study's quality [11].

Handpicking the literature
The search, selection and screening of articles were conducted by two judges, the papers authors. There was no need of a third judge to reach consensus.

For the scalping of the literature, we, first, decided which articles would fit better in the objective of this article. The goal being manufacturing a document that could synthetized the main factors associated to empathy levels in medical students we decided to select observational studies that investigated levels of empathy in medical student's population and, at the same time related it to variants that were selected by tha authors.

After this initial process, in which we analyzed a random group of articles, we selected a range of factors that recurrently appeared in the literature as variants of interest in the modulation of empathy. This factor beying: gender, stress and/or burnout, income, home country and social support.

In addition, we found a range of articles that considere the evolution of empathy throughout medical training important and decided to include this theme in our review too.

Search and selecting
The words "empathy", "medical students", "empathetic" and "medical student" were searched in PubMed, Embase, and Cochrane databases, yielding 2553, 2186, and 191 results, respectively.

Articles were excluded that:

1. Didn't include observational data about the levels of empathy in the medical students' population.

2. Included other variants besides gender, stress and/or burnout, income, home country, and social Support, and at the same time excluded all of them.
3. The presented students were from only one year of medical school, making it impossible to compare them with students from different years.
4. Studied only other majors

In the first phase, studies were selected based on their titles. After this, 26 articles were selected from PubMed, 22 articles from Embase, and one from Cochrane.

Then, excluding duplicates, articles that showed up in more than one database, we were left with 45 articles in total.

As a second filter, we used ASReview LAB to select the remaining studies based on their abstract. The IA model was supervised by the authors, who read all the abstracts that passed by the IA filter, confirming its selection. After this stage, 31 articles were selected.

Finally, after reading the article in full, we were left with 11 articles to review.

Data and extraction
The following characteristics were recorded in a data extraction form: country where the study as conducted, variants considered to influence empathy and evaluation of empathy levels throughout medical training. And were organized in two lists. The first that summarized all the articles in the following topics: title, country of origin, the variants in the modulation of empathy addressed in the article, how these factors influenced empathy (increased or decreased its levels) and evolution of empathy throughout medical training (if it was addressed in the article). The second list, was divided in themes, being: gender, stress and/or burnout, income, social support and evolution of empathy troughout training. In which topic, we assembled all the information gathered from the articles about which variant, in order to provide a global vision of the way they modulated empathy.

Analysis and synthesis
Once organized in these two lists, the data was analyzed and correlations between articles were made within each theme, finding conformities and discrepancies. Then, these findings were synthetized in descriptive

paragraphs, which were, once again, evaluated, generating interpretative paragraphs, that reflected the authors impressions and opinions.

Results and Discussion

Regarding the place where these eleven articles selected for this study were conducted, we had countries such as spain, where multiples centers were used [9]; United States of America, at Boston University School of Medicine [3]; Mexico [5]; Poland [12 – 13]; South Korea [14 – 15]; Portugal [16]; Brazil [17]; Pakistan [18] and the Caribbean, at the University of the West Indies, St. Augustine, Trinidad and Tobago [19].

All the studies included were cross sectional studies and used convenience sampling.

The scales used in which study are specified in Table 1

One study were conducted online [9], three were in-person [3, 16 - 17], and seven didn't specified [5, 12, 13, 14, 15, 18, 19].

We summarized all relevant information in Table 1.

Gender rule on empathy levels

Among the studies that have explored the factors that modulate empathy in medical students, gender consistently emerges as one of the most prominent variants. In this sense, our data analysis reveals a clear pattern: female medical students tend to exhibit significantly higher levels of empathy than their male counterparts.

This trend is broadly supported by all the studies included that researched gender as a relevant factor. From Spain [9] and Portugal [4], through Poland [13], Mexico [5], the Caribbean [19], Pakistan [18], South Korea [15] and Brazil [17], the research points to higher levels of empathy in women. Differences are statistically significant, with p-values lower than 0.005 and confidence intervals that reinforce the robustness of these findings.

Nonetheless, some limitations must be taken in consideration, particularly when it comes to the higher proportion of female participants in three of these studies [5, 9, 19], what could, according to its authors, influence the results, even though the difference in empathy by gender were statistically significant.

It's important to note that while most studies indicate this gender difference, the magnitude and nuances can vary. For instance, while the South Korean study [15] found that female students exhibited significantly higher empathy scores in the affective aspects of the IRI-MS (Interpersonal Reactivity Index for Medical Students) and on the JSPE-S (Jefferson Scale of Physician Empathy - Student version), there was no significant gender difference in the perspective-taking dimension of the IRI-MS. The authors of this study suggest that gender differences in empathy may be more pronounced in some dimensions (emotional) than in others (cognitive).

The consistency of this finding raises some theories within these articles. Most of them point to social-cultural factors [5, 13, 17]. In The Mexican study [17], the author raises a pertinent caveat: "This does not necessarily imply that men are less empathetic, since there may be a lower male willingness to express empathy.", meaning that might be a difference between what male subjects feel versus what they demonstrate, suggesting they could be more inclined to avoid feelings demonstration than their female counterparts and that empathy measures might not capture the internal experience of empathy as much as its expression, and that response biases could influence the results.

Agreeing with their lining of thinking, we suggest a theory to this pattern. In her masterpiece, Le Deuxième Sexe (1949), Simone de Beauvoir, when proposing the existence of myths in which the patriarchal system bases female roles, rises the concept of the “Eternal Feminine”. This specific myth is defined as an unchanging, passive, mysterious and empathetic essence attributed to all women, regardless of their lived experiences and personality.

Being raised in a society that considers empathy as an inherent, almost mandatory, attribute to women, females become more likely to value and demonstrate this feature. In counterpart, men are generically coerced to avoid features related to women, in a sense that these characteristics can be associated to weakness and feminization, things we, as a society, find degrading when related to males. This way it is logical to assume that men are discourage and, therefore, less likely to develop empathy or, at least, to demonstrate it. Not because they are genetically less capable, but because they are socially prevented from doing so.

The relationship between stress and/or burnout and empathy levels

Medical training is globally recognized as a demanding and challenging journey that can significantly impact students' mental health, causing stress and health issues such as anxiety and burnout. This last one is a widespread problem among healthcare students, and is known to negatively impact academic efficacy [9, 15]. Recent literature has explored the prevalence of diseases such as depression, anxiety, and burnout among this population, as well as the relationship between these factors and empathy levels.

Taking into account the variants stress and burnout and how they impact empathy levels, the results obtained whithin our sample are not that consistent. One Spanish multi-center cross-sectional study [9] showed no correlation between gender and burnout and empathy and burnout, although it found that medical students have a high risk to develop the condition. In discordance, other studies have shown a negative and relevant correlation between the two factors, meaning that as stress levels increase, empathy levels tend to decrease. A study in Poland [13] found that fatigue, that we assume being correlated to burnout risk, was a significant predictor of empathy ($p < 0.01$). Another study in South Korea [15] also highlighted the significant correlation between empathy and burnout scores.

What caught our attention was that in Park [14], they demonstrated that although women had high levels of stress, they also showed high levels of empathy, ruling against the theory that higher levels of stress means lower levels of empathy, when applied to the femle subjects. They interpreted it as evidence of women being more emotionally sensitive to both stress and empathy, making them both more stressed and empathetic at the same time.

We believe otherwise: female students, differently of their male colleagues, experience more stressful situations related to gender. For instance, a mixed quantitative and qualitative survey of medical students [20] found that females were significantly more likely to report personal experience of gender-based discrimination and sexual harassment than their male colleagues, a finding supported by a systematic review [8] that included 57 cross-sectional and 2 cohort studies. In this review they bring up the fact that consultants and senior doctors were the most frequently sources of harassment behavior towards female students and colleagues. Not only that, a retrospective cross-sectional study of 37610 MDs graduated

between 2016 and 2020 [21], showed that only 6,2% of male students suffered recurrent gender discrimination, while 20,1% of their female colleagues reported the same problem.

Therefore, we are more inclined to conclude that, regardless of any genetic assumptions, these gender based stressful situations may be a reason to higher levels of stress in this population, and being so, remedial measures must be taken in order to prevent stress and burnout in female students.

Other aspect of high levels in both empathy and stress in female groups is that it can cause in the empathic actor a condition named "compassion fatigue" [5], which can include symptoms of anxiety and depression. This condition is greater noted in health students than in students from other areas, and their intensity is greater in female students.

At Shin HS et al., the authors found that burnout levels increased significantly with medical students' rising seniority [15]. The same conclusions were obtained in Capdevila-Gaudens P et al., that showed that "burnout levels increased after the first year of medical degree, with the highest scores being found in the fifth year". Which, we propose, can be explained by the gathering of workload, mentally exaustation and a stressful routine, characterized by long work-hours and sleep deprivation [3], lived by these students throughout the years in medical training.

Income and empathy levels

The socioeconomic dimension, although rarely the primary focus of empathy studies, is systematically considered a confounding factor or a relevant sociodemographic characteristic, what may, according to these authors, indicate its role in modulating empathy levels [3].

When it comes to results, one study in Brazil [17] found no correlation between empathy scores and household monthly income. We must raise a concern about the accuracy of this finding: living the reality of medicine in Brazil, we, as authors, believe that the access to medical education is still limited to a select group of people who can afford it. Although the household income can vary within this group, we think that there is a high possibility that most of the subjects do not go through high levels of financial stress, since they have de means to support themselves throughout medical school. Other possibility to this find, is that the study was conduct in a federal facility, which means, in Brazil, that there's no tuition paid by the students and their families, what can positively influence the cost of life and financial stress.

In this sense, another study [13] conducted in Poland found that quality of life is a statistically significant predictor of empathy. The authors raise the possibility that "a low quality of life might hinder students' ability to pay attention to the needs of others", in a sense that, "being aware of their own suffering, makes it more difficult to notice that someone else needs help".

Even though we only found one article that supports our beliefs, we strongly think that income impacts empathy through its interconnection with well-being and Quality of Life. Financial stress, directly associated with low income, can be a predictor of fatigue and burnout. Since Quality of Life is a predictor of empathy, any factor that compromises it, such as financial worry, has the potential to undermine the emotional resources necessary for maintaining a robust empathic attitude.

Social support

The influence of Social Support on empathy is directly investigated in a study about the relationship between empathy, stress, and social support [14]. A large sample of 2692 students demonstrated that Perceived Social Support was positively associated with empathy among medical students. According to the authors, there is little research on the association between empathy and social support among this population, and, as we developed our research, we had difficulty finding articles to enrich this discussion. Thus, we tried to articulate a theory that could explain this study's results.

The main way authors claim Social Support exerts its influence is by mitigating stress. Perceived stress is consistently identified as a factor inversely related to empathy [9, 13, 15]. Thus, Social Support acts as a buffer, reducing the impact of academic and clinical stress and protecting the student's cognitive and emotional resources, allowing them to have the energy and capacity to engage in the patient's perspective and respond compassionately.

Furthermore, the authors assert that Social Support is linked to Quality of Life, which is a positive and significant predictor of empathy. When students feel supported—which translates into better well-being and higher Quality of Life—they are less vulnerable to compassion fatigue and are more likely to maintain a prosocial attitude. Ahead, they propose that creating a supportive environment within the medical school, whether through formal programs or a culture of camaraderie, is consequently a fundamental strategy for preserving and promoting empathy.

From our perspective, the lack of a robust social support system and the resulting stress overload have direct implications for mental health, which is a negative predictor of empathy. In this sense, we are in full agreement, to the author's speculation since it follows our reasoning so far. We believe that, even though, supported by only one study in our sample, this could establish interpersonal support (whether from peers, family, or the institution) as a fundamental psychosocial resource for maintaining empathy levels.

Empathy throughout medical school

As already established, empathy is a core competency and a crucial educational objective in the training of future doctors, essential for the quality of the doctor-patient relationship. However, the analysis of these studies reveals a complex dynamic with a predominant and concerning trend observed across institutions: a decline in empathy as collegians progress through the college years.

Although one particular study [9] showed an increase in empathy throughout medical school, most studies demonstrated at least one point of decrease in empathy levels among these students [3, 6, 7, 19]. This variant, often measured by the *Jefferson Scale of Physician Empathy* (JSPE), tends to be significantly higher in entering classes (first year) and reaches its lowest scores in the more advanced clinical years (typically the fourth, fifth, and sixth years). This pattern of decline is referred in some works as an "erosion" of empathy [12, 19].

Addressing first Capdevila-Gaudens et al. [9] and its divergent results, they found empathy increased throughout medical degree years, but they did not offer an explanation for this increase. We argue that, as all studies included here used self-assessment scales, students could be inclined to answer what they thought was expected of them, in a sense that, if empathy is a key value in their approaching career, having a lower level of it can have add a negative value in their self-perception.

The remaining articles establish a contrary and sustain pattern; most students tend to lower their empathy levels as they progress in medical school years, particularly when it comes to transitioning into clinical years.

In Youssef et al. [19] it is suggested that factors such as loss of idealism and increased workload are important determinants to this loss of empathy. Moreover, they point the transition from the safe space of the classroom to the vulnerability of medical-patient interactions and the

demand to conciliate theorical and practical studies as inducing factors to this decrease.

Furthermore, Chen D et al. [3]. point various stressful aspects of medical education and training, such as long work-hours, sleep deprivation, dependence on technology for diagnoses, shorter patient hospitalizations, and limited bed side interactions as contributing factors to the pattern. Not only that, but they also argue that experiencing a wide range of emotions and stresses, medical students may struggle to maintain their empathy, suggesting that, to remain effective for patients, they become less empathic as they face emotionally challenging and draining situations.

Zdun-Ryżewska et al. [12 - 13] Proposes simply that "medical students might become more cynical as they progress through medical".

Interestingly, when it comes to women, we found evidence [15] that point to the maintenance of empathy levels in this group. In this article, they claim that the decrease found by the JSPE-S test were significant only in male students, what, in their opinion, meant their female counterparts were more empathetic specifically in patient care settings.

In summary, the empirical evidence suggests that empathy, rather than naturally strengthening with experience, is a fragile quality that tends to diminish during medical school. We agree that the vulnerability of empathy is not an isolated phenomenon but a reflection of the demands and environment of medical education. We observe that progression through medical school is intrinsically linked to increased exposure to stressors and a high workload, factors that are, as presented previously, negatively correlated with empathy.

A synthesis of the results can be found in Table 2.

Conclusion

Empathy is a cornerstone of clinical competence and a key determinant of the quality of the doctor-patient relationship [3, 5, 16]. Its maintenance and development throughout medical school are, therefore, a central focus for medical education. The analysis of the data presented led us to the conclusion that empathy is not a static characteristic, but rather a dynamic, complex, and vulnerable trait, modulated by intrinsic and extrinsic factors and that the trajectory of empathy over the years, as well as its magnitude, is significantly influenced by variables such as gender, mental health

(including stress and burnout), socioeconomic context, and the availability of social support.

Among the factors that modulate empathy, gender emerges as the most consistent and statistically robust variant. Evidence from a wide range of geographical contexts, including studies from Spain, Portugal, Poland, Mexico, the Caribbean, Pakistan, South Korea, and Brazil [4, 5, 9, 13, 15, 17, 18, 19]. Nonetheless, some limitations must be taken in consideration, particularly when it comes to the higher proportion of female participants in three of these studies [5, 9, 19].

Taking into account the variants stress and burnout and how they impact empathy levels, studies have shown a negative and relevant correlation between empathy and stress and/or burnout, meaning that as stress levels increase, empathy levels tend to decrease [13, 15]. One exception to that consisted in the fact that Park KH et al. demonstrated that, when it comes to female subjects, higher levels of stress do not predict lower levels of empathy.

In the socioeconomic dimension, one study in Brazil [17] found no correlation between empathy scores and household monthly income. Oppositely, another study [13] conducted in Poland found that quality of life is a statistically significant predictor of empathy.

The influence of Social Support on empathy was demonstrated to positively influence empathy among medical students [14].

Although one particular study [9] showed an increase in empathy throughout medical school, most papers demonstrated at least one point of decrease in empathy levels among these students, particularly when it comes to transitioning into clinical years [3, 6, 7, 19]. Again, when it comes to women, we found evidence [15] that point to the maintenance of empathy levels.

Ultimately, the findings of this review reinforce that empathy is a fragile quality that, under the weight of stressful situations endured by medical students during their training, such as patient dehumanization, power hierarchy concerns in training, 'hidden assessment' of performance, suppression of normal emotional responses and pressure to 'fake it' [19], tends to diminish. Based on this conclusion, we suggest that future interventions should not be limited to theoretical ethics classes, already conduct on most universities, but instead focus on creating a supportive

learning environment that actively mitigates stress, promotes well-being (Quality of Life), and establishes a robust Social Support system that could influence individuals' quality of life and helps them to be more empathetic [13]. Ensuring, this way, that future physicians maintain the emotional resources necessary for a compassionate and high-quality clinical practice.

In addition, although we understand that it is almost impossible to remove or reduce all the stressors affecting medical students. In concordance with our results [14], we advise that medical students should be provided with tools, as part of the curriculum, that help teach them how to manage stress and seek social support. Not only that, but we also propose mental health support programs that address student's mental issues and distress.

Lastly, we point to the necessity to ponder the differences found between genders when designing education measures [14], possibly addressing male difficulties to demonstrate empathy, and gender related violence endured by the female students, such as harder punishment to authority figures that practice this violences and a more effective system to address this situations and receive this victims.

The limitations to this study are:

1. All the articles used are cross-sectional studies so we can't establish, with certainty, causality or temporal sequences between the factors addressed in this article and empathy.

2. Since all articles used self-avaliation tools, we must take into consideration that subjects' responces could not be completly reliable.

3. Being a narrative review, this article wasn't produced with the same rigorously of a systematic review and express the opinions included in articles used in the study as well as opinios of this paper's authors.

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Table 1. Comparison of relevant information

Coluna1	Coluna2	Coluna3	Coluna4	Coluna5	Coluna6	Coluna7	Coluna8	Coluna9	Coluna10	Coluna11	Coluna12
Study	(Capdevila-Gaudens P et al., 2021)	(Chen D et al., 2007)	(Luna D. et al., 2022)	(Zdun-Ryżewska, Sobczak, & Rudnik, 2021)	(Park KH et al., 2015)	(Santiago LM et al., 2022)	(Santos MA et al., 2016)	(Shin HS et al., 2021)	(Zdun-Ryżewska, Sobczak, & Rudnik, 2022)	(Irfan, Saleem, Sethi, & Abdullah, 2019)	(Farid F et al., 2014)
N	5216	658	285	700	2692	795	595	1293	1701	2170	669
Scale Used	JSPE MBI-SS	JSPE-S	EEMJ-E IRI	EQ-40	JSPE PSS MSPSS	JSPE-S	JSPE-S	JSPE-S; IRI; MBI-SS	EQ-40 PSS-10	SEiS; IRI	JSPE-S; TEC; RMET
Statistical Analyses	IBM SPSS	Descriptive statistics	SPSS v20	Statistica 13.1	Statistical Package for the Social Sciences	SPSS	not specified	IBM Statistical	Statistica 12	SPSS-20	SPSS-v17
Covariants consedered	Trainning year Gender Burnout	Trainning year Gender Income	Gender	Trainning year Gender	Social support	Trainning year Gender	Gender Income	Trainning year Gender Burnout	Trainning year Gender Stress Income	Gender	Trainning year Gender
Country	Spain	USA	Mexico	Poland	South Korea	Poland	Brazil	USA	Poland	Pakistan	Caribbean
Type	Cross-sectional	Cross-sectional	Cross-sectional	Cross-sectional	Cross-sectional	Cross-sectional	Cross-sectional	Cross-sectional	Cross-sectional	Cross-sectional	Cross-sectional
Modality	online	in person	_	_	_	in person	in person	_	_	_	_

Source: The authors.

Table 2. Result's synthesis

Variant	Impact in empathy	Considerations
Gender	positive correlation (female)	Tends to be higher in female subjects
Stress and/or Burnout	negative correlation	As levels of stress and/or burnout raise, levels of empathy decrease
Income	positive or no correlation	One study showed no correlation, the other one showed that higher incomes translated to higher empathy levels
Social Support	positive correlation	The more socil support subjects had, the higher empthy levels tended to be
Training Year	negative correlation	As the subjects progressed trough medical school, empathy levels tended to decrease

Source: The authors.

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