FACULDADE DE MEDICINA
UNIVERSIDADE DO PORTO

MESTRADO INTEGRADO EM MEDICINA

2014/2015

Pedro Amadeu da Silva de Almeida

The role of happiness and distress as predictors of medical student's empathy

agosto, 2015

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UNIVERSIDADE DO PORTO

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The role of happiness and distress as predictors of medical student's empathy

Mestrado Integrado em Medicina

Área: Psiquiatria e Saúde Mental

Tipologia: Dissertação

Trabalho efetuado sob a Orientação de:

Doutora Margarida Figueiredo Braga

Trabalho organizado de acordo com as normas da revista:

Medical Education

agosto, 2015

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FMUP FACULDADE DE MEDICINA UNIVERSIDADE DO PORTO
UNIDADE CURRICULAR
PROJETO DE OPÇÃO
DISSERTAÇÃO / MONOGRAFIA

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200907050	25/08/2015

DESIGNAÇÃO DA ÁREA DO PROJECTO

Psiquiatria e Saúde Mental

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The role of happiness and distress as predictors of medical student's empathy

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Assinatura conforme cartão de identificação: Pedro Amadeu da Silva de Almeida

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Word count:

Full text: 2828

Abstract in english: 220

Abstract in portuguese: 244

ABSTRACT

Introduction: The importance of empathy in physician-patient relationship highlights the need to look into its determinants during medical education. Although previous studies found that medical student's distress and well-being may affect their empathic ability, this relationship needs more clarification. Our study intends to investigate the association between student's happiness, depression, anxiety and stress with the different domains of empathy.

Methods: We performed a cross-sectional study comprising 432 medical students from the Faculty of Medicine, University of Porto. The Interpersonal Reactivity Index (IRI) was used to assess empathy. Validated questionnaires were performed to measure happiness, depression, anxiety and stress. Bivariate and multivariate analyses were performed to explore the association between these variables.

Results: The student's happiness was positively associated with Perspective Taking and Emotional Concern subscales of IRI and negatively correlated with Personal Distress subscale. Depression, anxiety and stress were negatively correlated with Perspective Taking on bivariate analysis. However, only depression had a predictive power on multivariate analysis. The stress was a positive predictor of both Emotional Concern and Personal distress subscales.

Discussion: Happiness was the strongest predictor of both cognitive and affective dimensions. The distress showed to affect negatively medical student's empathy, while its influence is different between cognitive and affective empathies. Tailored strategies are needed to promote well-being and to enhance the student's empathic ability through medical school.

RESUMO

Introdução: A importância da empatia na relação médico-doente realça a necessidade de investigar os seus determinantes na educação médica. Embora estudos anteriores tenham demonstrado que tanto a felicidade como o sofrimento psicológico dos estudantes de medicina afetam a sua capacidade empática, esta relação necessita de mais esclarecimento. O nosso estudo pretende investigar a associação entre a felicidade, depressão, ansiedade e stress dos estudantes com as diferentes dimensões da empatia.

Métodos: Foi realizado um estudo transversal com 432 alunos da Faculdade de Medicina da Universidade do Porto. O ''Interpersonal Reactivity Index'' (IRI) foi utilizado para avaliar as diferentes dimensões da empatia. Questionários validados foram usados para medir a felicidade, depressão, ansiedade e stress. Análises bivariadas e multivariadas foram feitas para explorar a associação entre estas variáveis.

Resultados: A felicidade dos estudantes correlacionou-se positivamente com as subescalas do IRI ''Tomada de Perspectiva'' e ''Preocupação Empática'' e negativamente com a subescala ''Sofrimento Pessoal''. Depressão, ansiedade e stress correlacionaram-se negativamente com a ''Tomada de Perspectiva'' na análise bivariada. No entanto, apenas a depressão teve valor preditivo na análise multivariada. O stress foi um preditor positivo das subescalas ''Preocupação empática'' e ''Sofrimento pessoal''.

Discussão: A felicidade foi o preditor mais forte tanto na empatia cognitiva como afetiva. O distress afetou negativamente a empatia dos estudantes de medicina, apesar da sua influência seja diferente na empatia cognitiva e afetiva. Estratégias adaptadas são necessárias para promover o bem-estar e para melhorar a capacidade empática dos alunos durante a educação médica.

INTRODUCTION

Empathy is an essential tool in the physician-patient relationship and a core competence of medical professionalism [1,2]. It may contribute to increase patient's confidence, satisfaction and compliance [3,4], the accuracy in diagnosis [5], clinical outcomes [6,7] and physician's professional and personal accomplishment [4,8]. In the clinical setting empathy generally is defined as an interpersonal capacity composed by two main dimensions: cognitive – the ability to recognize and understand the patient's inner experiences and emotions – and affective – emotional response to the patient's feelings [9,10]. The affective dimension gathers two distinct components: emotional concern, which represents the physician' capacity to share emotions and be attuned with the patient's feelings, and personal distress, which assesses the emotional response under distressing events [11].

To develop and train empathic ability is considered a primary objective in medical education. Although it's a teachable and desirable tool, there is some controversy regarding the evolution of empathy throughout the medical school. Initially assumed to decay during the clinical phase [12-16], recent studies have considered that the reported decline of empathy is exaggerated [17-20]. Several factors may affect medical student's empathy, but it is still undear wherein extension. The variation of empathy depends partly on the academic environment and the demands of the medical curriculum [21]. Medical student's personal characteristics are also important. These factors include gender, personal dispositions [22], personality traits [23] and levels of happiness and distress. Female gender and well-being are associated with higher levels of empathy [9, 22, 24-27], while psychological suffering may contribute to its reduction [26,28].

Medical school is frequently a stressful experience to medical students. Previous studies reported higher levels of personal distress, namely depression, anxiety and stress, and lower levels of happiness particularly in female students when compared to the general population [29,32]. The erosion of medical students' mental health is a multifactorial phenomenon associated with several causes, including the adjustment to medical environment, medical curriculum, time pressure, exposure to human suffering and student's abuse [33-37]. Conversely student's distress influences their competency and professionalism [28].

The reciprocal relationship between empath depression, anxiety and stress is still unclear and studies addressing the impact of medical students' psychosocial characteristics either in cognitive or affective dimensions of empathy are scarce. The recognition of personal and psychosocial factors affecting student's empathic abilities could contribute to define tailored strategies to enhance empathy through medical school.

This study intends to examine the relationship between psychosocial characteristics namely depression, anxiety and stress and subjective well-being and happiness and cognitive and affective empathy in a population of medical students. Following an observational cross-sectional design students of preclinal years (first and third years) of the Faculty of Medicine, University of Porto were included in the present study.

METHODS

Participants and data collection

This study included 432 students in the first (46,3%) and third year (53,7%) from the Faculty of Medicine, University of Porto. The sample represents 80% of total of students enrolled in those years.

Surveys distributed to the students in September of 2014 permitted to assess students' social-demographic and professional characteristics through an original questionnaire. Standardized instruments were used to measure empathy, happiness, depression, anxiety and stress. The surveys were completed anonymously and data confidentiality and privacy were assured.

Ethics

Students received written and verbal information on the study goals and procedures and signed a written informed consent form. The study was submitted and approved by the Ethics Committee and Administration Council of the São João Hospital EPE (232-2013).

Instruments

Empathy

Medical students' empathy was measured using the Portuguese version of the Interpersonal Reactivity Index (IRI), which includes 24 questions answered on a Likert type scale ranging from 0 (''does not describe me well'') to 4 (''describes me very well'')[38]. The IRI is formed by four independents subscales that assess the different dimensions of empathy. The cognitive empathy is assessed by the ''perspective taking'' (PT) subscale, which represents the ability to understand the emotions of others. The affective empathy is assessed by three subscales: ''emotional concern'' (EC) – sharing of emotions with the patients; ''fantasy'' (FS) - ability to imagine and put yourself in the place of fictional characters; and ''personal distress''(PD)- ability to experience personal distress when exposed to stressful situations. The IRI has shown to be a reliable and reproducible measure of self-reported empathy. The Cronbach' alpha of the original version was 0,75 (PT), 0,72(EC), 0,78(FS) and 0,78 (PD) [39].

Happiness, anxiety, depression and stress

An adapted version of Oxford Happiness Inventory (OHI) was used to measure the medical student's happiness. This scale is composed by 29 statements ranging from 1 (strongly disagree) to 6 (strongly agree). The reliability and reproducibility of OHI scale was established and the scale showed a 0,92 Cronbach's alpha [40].

The Portuguese version of Hospital Anxiety and Depression Scale (HADS) was used to determine the presence of anxiety (HADS-A) and depressive symptoms (HADS-D) among the participants [41]. This scale is composed by 14 questions answered on a 5-point Likert scale, divided in two subscales of seven items. The internal consistency and reliability of this scale was assessed: Cronbach's alpha of 0,82 (HADS-A) and 0,81 (HADS-D) [42].

The way medical students appraise their lives as being stressful was assessed using the Portuguese version of the Perceived Stress Scale (PSS) [43], a validated and reliable (Cronbach's alpha of 0,83) 10-item questionnaire used to measure the perception of stress in several clinical and non-clinical settings [43,44].

Statistical analysis

Descriptive statistics were calculated for all variables. Mean and standard deviation described continuous variables and N and relative frequencies were used for categorical variables. Chi-square test of independency was used to compare frequencies of the categorical variables for male and female participants. The means of continuous variables for both genders were compared using independent simple t-test. The assumption of normality was tested with K-S tests. Bivariate correlations were used to establish the association between IRI subscales and the psychosocial variables studied. In order to explore the predictive power of these variables to medical students' empathy, we performed models of multivariate simple regression to each subscale of empathy choosing as predictors the variables that were significant at bivariate analysis: student's gender, happiness, depression, anxiety and stress. The p-value threshold was settled in 0,05.

RESULTS

Socio-demographic and professional evaluation (table 1)

Our sample included 421 medical students, of which 289 were female and 132 were male. The mean age for the total sample was 19,4 (SD=2,5) years. As shown in Table 1, the students were evaluated with respect to their social-demographic and professional characteristics. Similar results were detected in both genders.

Table 1 – Sociodemographic and academic characterization

	Total n=421	**Men n=132**	**Women n=289**	***P***
Year[a]				0,832[c]
First year	195 (46,3)	60 (45,5)	135 (46,7)	
Third year	226 (53,7)	72 (54,5)	154 (53,3)	
Age[b]	19,4 (2,5)	19,5 (2,80)	19,39 (2,4)	0,721[d]
Range	17-36	17-35	17-36	
College Access grade[b]	18,6 (0,6)	18,7 (0,7)	18,6 (0,6)	0,732[d]
Range	14,6-19,9	15-19,9	14,6-19,9	
Attendence in other course[a]				0,385[c]
Yes	40 (9,5)	15(11,4)	25 (8,7)	
Moving home last year[a]				0,743[c]
Yes	131 (31,1)	40 (30,3)	91 (31,5)	
Type of accommodation[a]				0,572[c]
Own home	248 (58,9)	81 (61,4)	167 (57,8)	
Rented home	113 (26,8)	34 (25,8)	79 (27,3)	
Rented room	35 (8,3)	11 (8,3)	24 (8,3)	
Other	9 (2,1)	1 (0,8)	8 (2,8)	
Lives with a				0,612[c]
Family	257 (61,0)	85 (64,4)	172 (59,5)	
Friends/Colleagues	97 (23,0)	25 (18,9)	72 (24,9)	
Alone	25 (5,9)	8 (6,1)	17 (5,9)	

[a]n(%); [b]Mean (standard deviation); [c]Chi-square; [d]t - test

Psychological variables and Empathy (IRI) evaluation (table 2 and 3)

The construct validity of IRI was evaluated performing an exploratory factor analysis and a solution with two factors explaining 71% of variance was found. The first factor includes PT subscale and the second includes the others three subscales. To prove internal consistency reliability of IRI in our sample, we calculated the alpha Cronbach coefficients for the IRI subscales. The Alfa-Cronbach values for our sample are: 0,72 (PT); 0,73 (EC); 0,79 (FS) and 0,81 (PD).

Student's psychosocial variables and the four dimensions of empathy measured by IRI were evaluated and compared between genders and years. Female students scored statistically significantly higher than male in all IRI subscales (p<0,03). The female students showed statistically significantly higher scores in OHI (p=0,04) and PSS (p=0,02). Regarding HADS both subscales presented similar results in female and male students.

Data not showed: First and third-year students presented similar results in PT (p=0,177), EC (p=0,713) and FS (p=0,653) subscales. First-year students had significantly higher scores in PD subscale (p=0,003). Both years presented similar scores on happiness (p=0,077), depression (p=0,689), anxiety (p=0,823) and stress (p=0,144) scales.

Table 2 – Empathy evaluation

	Total N=421	**Men N=132**	**Women N=289**	**P**
Perspective taking[a]	17,2 (3,5)	16,7 (3,5)	17,5 (3,5)	**0,024[b]**
Range	7-24	7-24	7-24	
Emocional concern[a]	15,3 (2,9)	14,4 (2,8)	15,7 (2,9)	**0,000[b]**
Range[a]	6-25	6-23	7-25	
Fantasy[a]	12,0 (4,3)	9,9 (4,4)	13,0 (4,2)	**0,000[b]**
Range	0-20	0-20	0-20	
Personal distress[a]	10,2 (3,8)	9,6 (4,0)	10,5 (3,7)	**0,028[b]**
Range	1-22	1-19	2-22	

[a]Mean (standard deviation); [b]t - test Table 3 – Happiness, depression, anxiety and stress evaluation

	Total n=421	**Men n=132**	**Women n=289**	***P***
Happiness[a]	132,4 (17,4)	129,4 (19,5)	133,7 (16,3)	**0,023[b]**
Range	62-168	62-164	74-168	
Depression[a]	8,9 (1,6)	8,9 (1,7)	8,9 (1,5)	0,946[b]
Range	3-16	3-16	3-13	
Anxiety[a]	9,6 (2,1)	9,6 (2,2)	9,5 (2,0)	0,668[b]
Range	5-18	5-18	6-17	
Stress[a]	15,1 (5,9)	14,1 (5,9)	15,6 (5,9)	**0,022[b]**
Range	2-40	2-33	2-40	

[a] Mean (standard deviation); [b]t- test

Correlation between IRI subscales and happiness, depression, anxiety and stress (table 4)

Table 4 shows the simple correlations between the subscales of empathy and the other psychological variables. The PT subscale was positively correlated with happiness (p=0,00) and negatively with depression (p=0,02), anxiety (p=0,00) and stress (p=0,00). The EC subscale showed a positive correlations with the OHI (p=0,00), HADS A (p=0,01) and PSS (p=0,00). The FS subscale was positively correlated with the PSS (p=0,03). The PD subscale had a positive correlation with HADS A (p=0,00) and PSS (p=0,00) and a negative correlation with OHI (p=0,00). No statistically significant associations were found between HADS D and the other three subscales.

Table 4 –Correlations between IRI subscales and other psychological variables

	Perspective taking	**Emocional concern**	**Fantasy**	**Personal distress**
Happiness[a]	**0, 37 (0,000)**	**0,14 (0,006)**	0,03 (0,573)	**-0,29 (0,000)**
Depression[a]	**-0,11 (0,022)**	-0,03 (0,591)	-0,06 (0,210)	-0,03 (0,529)
Anxiety[a]	**-0,18 (0,000)**	**0,12 (0,013)**	0,09 (0,074)	**0,21 (0,000)**
Stress[a]	**-0,25 (0,000)**	**0,15 (0,002)**	**0,15 (0,003)**	**0,32 (0,000)**

[a]Pearson coefficient (p-value)

Multivariate correlations between IRI subscales and gender, happiness, depression, anxiety and stress (Table 5)

Table 5 shows multivariate models constructed for the four subscales of empathy and included as predictors gender and the other psychosocial variables. When adjusted to all variables, the strongest determinants of empathy were: for PT, happiness (p=0,00); for EC, gender p=(0,02), happiness (p=0,00) and stress (p=0,00); for FS, gender (p=0,00) and stress (p=0,03); for PD, gender (p=0,01), happiness (p=0,00) and anxiety (p=0,01). All variables presented positive correlations, with exception of happiness in the PD subscale. Depression had no predictable value for any variable.

Table 5 - Multivariate correlations between IRI subscales and gender, happiness, depression, anxiety and stress

	Perspective taking	**Emotional concern**	**Fantasy**	**Personal distress**
Gender[a,b]	0,68 (0,079)	**0,99 (0,002)**	**2,76 (0,000)**	**1,12 (0,006)**
Year[a,b]	-0,16(0,343)	0,044(0,754)	0,23(0,273)	-0,663(0,000)
Happiness[a,b]	**0,06 (0,000)**	**0,05 (0,000)**	0,03 (0,076)	**-0,05 (0,000)**
Depression[a,b]	**-0,21 (0,050)**	-0,07 (0,42)	-0,24 (0,078)	-0,16 (0,172)
Anxiety[a,b]	-0,05 (0,606)	**0,16 (0,049)**	0,11 (0,372)	**0,29 (0,006)**
Stress[a,b]	-0,06 (0,125)	**0,13 (0,000)**	**0,11 (0,025)**	0,06 (0,175)

a - beta (B) regression coefficient ; b - p-value

DISCUSSION

Several studies claim that the medical education is responsible for marked changes in the students' mental health, with a high prevalence of depression, anxiety and stress not only in medical students but also in residents [29,32, 45]. In our sample of students of preclinical years, we detected a higher mean number of depressive and anxiety symptoms than described previously in groups of medical students from Germany, UK and India [46,47,48]. Similarly, our students had higher levels of stress than those reported in a study of Wongpakaran which gathered 368 medical students [49]. In all these variables, our students had higher scores when compared to samples of the general population [50,51]. Factors such as moving home, adjustment to the academic environment and lack of social and psychological support may contribute to this phenomenon, mainly in first-year students. Academic pressure, workload and competition among colleagues may also explain the high levels of distress. Consistent with previous studies, female students were more stressed than male students. Female students also had higher scores on the happiness scale, a finding that was not found in any study.

In recent years, several studies have recognized empathy as a central tool to prepare students for clinical practice.[24]. In the present study, IRI showed reliable psychometric properties and two factors were identified corresponding to cognitive and affective empathy. In our sample, cognitive and affective empathy presented similar scores to those found in other studies that included medical students. [52-55]. Nevertheless most of the studies point to a decrease in empathy throughout medical education [12-16], we did not find differences in cognitive and affective empathy (emotional concern and fantasy dimensions) between first-year and third-year students. At this point, it is not possible to draw definitive conclusions since our study only gathered students of the preclinical years and the most significant changes of empathy occurs after the beginning of the clinical practice. In turn, we hypothesized that the higher scores of first-year students in personal distress may be related to a negative perspective about their ability to deal with adverse situations, such as the demands of academic life or the contact with the healthcare system. As found in the literature, the scores of empathy in all IRI subscales were higher in female than male students [9,25].

The relationship between medical students' empathy and their mental health becomes increasingly important given the interdependence of factors affecting these variables and its parallel evolution throughout medical school. Accordingly, in our study we found significant associations between psychological variables studied and all subscales of the IRI, although the results of Fantasy subscale had been of little relevance.

Happiness showed to be an independent predictor of cognitive empathy. These

findings suggest that students with higher level of subjective wellbeing have a greater ability to understand the feelings of others, to anticipate their reactions and behaviours and to respond to them more appropriately. This improves the social functioning, creates a more objective and trustful communication and enhances the self-esteem of students. In clinical settings, these abilities may contribute to increase the quality of care and the wellness of both physicians and patients [4,9,24]. Albeit the literature have indicated that women are more successful in recognizing and responding to the emotions of others, our results indicate that the higher levels of happiness in females explain, rather than gender, their higher scores in cognitive empathy.

Happiness was also an independent predictor of higher levels of emotional concern. This finding suggests that happier students present higher emotional reactivity, showing a friendlier and more altruistic behaviour face to the feelings of others.

Depression, anxiety and stress were negatively associated with cognitive empathy, but only depression presented a borderline predictive power on multivariate analysis. This may possibly be linked with the cognitive impairment found in depression. Depressed people have a more obsessive and self-centred thinking and a lower capacity to concentrate, which may cause biases in understanding the mental states of others.

Stress and, on a small scale, anxiety were also a positive and independent predictors of emotional concern. This suggests that students who have higher personal predisposition to care about other people's emotions are more likely to capture and share feelings of psychological tension, which could be harmful to cognitive empathy, quality of care and student's quality of life [28]. On the other hand, we could also speculate that a certain degree of physiological and emotional activation is beneficial for sharing distressful feelings with others. This circularity and apparent contradicting results expose the difficulty of defining the influence of affective empathy in medical education. Thereby, some authors argue that affective empathy may be detrimental to medical communication, advocating that compassionated detachment is necessary to preserve the objectivity and competency in the physician-patient relationship [56-58]. In this sense, it is unclear whether the emotional concern is associated with improved social functioning [44]. More studies are to clarify this conflict.

Our results illustrating the personal distress dimension of empathy show that students experience feelings of tension and worry when exposed to adverse situations, which will be part of their future clinical experience. This phenomenon could promote maladaptive coping mechanisms that would lead to an insensitive and self-centred posture face the other people's suffering, which will result in the deterioration of medical students' and future doctors empathy [16].

The positive association between happiness and empathy in medical students is well-documented in the literature [22,25-27]. On the contrary, only a few studies investigated the relationship between empathy and distress applying validated instruments. Thomas and co-workers in a multicentre study reported that depression in medical students was negatively correlated with emotional concern, but it showed not be predictive of empathy when adjusted to other variables [26]. Unlike our results, another study found a direct relationship between anxiety and cognitive empathy scores [22]. To the best of our knowledge, no study explored the association between stress and empathy in medical students although research in hospital residents found stress as detrimental to empathy [59].

The multidimensional nature of empathy hampers the development of consensual assessment methods either for measurement or for teaching in medical schools. In spite of the several methods proposed to measure empathy, including direct observation, patient assessment and self-report questionnaires, all of them presented limited accuracy [60-64]. Our study used only self-report questionnaires, which may have impaired a deeper and more effective measurement of empathy. The fostering of empathy may be achieved with the use of several educational devices, including communication skills lectures [65,66], reflection practice [67], theatre practice [68] and students' hospitalization experiences [69]. However, all these approaches have limitations and their use is still limited [70].

Moreover, as seen in our study, empathy seems to depend of student's psychological balance. Thus, it is important to develop education approaches that act not only in support of medical students' mental health but also in promotion of their empathic capacities. The mindfulness-based stress reduction is, for example, a strategic that presents well-known results not only to enhance well-being in medical students as to promote empathy [71-73]. Another method which has proved effective is the use of courses about empathy, spirituality and wellness [74,75]. The teaching of adaptive coping strategies, such acceptance, planning and problem solving, should also be privileged in medical education, because it could enable students to deal with stressful events without losing their empathic skills [28].

Our study has also some limitations. First, this study doesn't infer causalities due to its cross-sectional nature. Secondly, generalization of the results is not possible since our study was limited to a single institution. Third, although significant findings had been identified, its magnitude was small. Our study presents also strengths. It was one of the first studies to evaluate the relationship of empathy with a wide range of psychosocial variables. Besides that, standardized instruments were used and the sample was adequate.

In our study, we concluded medical that student's empathy is directly affected by their mental health. Of all psychological variables, happiness showed to be the strongest predictor of both cognitive and affective empathy. Although distress affects differently the various dimensions of empathy, its reduction is advisable given its negative influence in student's capacity to empathize with other people.

REFERENCES

1. von Fragstein M, Silverman J, Cushing A, Quilligan S, Salisbury H, Wiskin C, et al. UK consensus statement on the content of communication curricula in undergraduate medical education. Medical education. 2008 Nov;42(11):1100-7.

2. Halpern J. What is clinical empathy? Journal of general internal medicine. 2003;18(8):670-4.

3. Larson EB, Yao X. Clinical empathy as emotional labor in the patient-physician relationship. Jama. 2005;293(9):1100-6.

4. Derksen F, Bensing J, Lagro-Janssen A. Effectiveness of empathy in general practice: a systematic review. British Journal of General Practice. 2013;63(606):e76-e84.

5. Mikesell L. Medicinal relationships: caring conversation. Medical education. 2013;47(5):443-52.

6. Kim SS, Kaplowitz S, Johnston MV. The effects of physician empathy on patient satisfaction and compliance. Evaluation & the health professions. 2004;27(3):237-51.

7. Hojat M, Louis DZ, Markham FW, Wender R, Rabinowitz C, Gonnella JS. Physicians' empathy and clinical outcomes for diabetic patients. Academic Medicine. 2011;86(3):359-64.

8. Rakel D, Barrett B, Zhang Z, Hoeft T, Chewning B, Marchand L, et al. Perception of empathy in the therapeutic encounter: Effects on the common cold. Patient education and counseling. 2011;85(3):390-7.

9. Hojat M, Gonnella JS, Nasca TJ, Mangione S, Vergare M, Magee M. Physician empathy: definition, components, measurement, and relationship to gender and specialty. 2014.

10. Batson CD, Fultz J, Schoenrade PA. Distress and empathy: Two qualitatively distinct vicarious emotions with different motivational consequences. Journal of personality. 1987;55(1):19-39.

11. Hojat M, Mangione S, Nasca TJ, Rattner S, Erdmann JB, Gonnella JS, et al. An empirical study of decline in empathy in medical school. Medical education. 2004;38(9):934-41.

12. Costa P, Magalhães E, Costa MJ. A latent growth model suggests that empathy of medical students does not decline over time. Advances in Health Sciences Education. 2013;18(3):509-22.

13. Tavakol S, Dennick R, Tavakol M. Empathy in UK medical students: differences by gender, medical year and specialty interest. Education for Primary Care. 2011;22(5):297-303.

14. Colliver JA, Conlee MJ, Verhulst SJ, Dorsey JK. Reports of the decline of empathy during medical education are greatly exaggerated: a reexamination of the research. Academic Medicine. 2010;85(4):588-93.

15. Bangash AS, Ali NF, Shehzad AH, Haqqi S. Maintenance of empathy levels among first and final year medical students: a cross sectional study. F1000Research. 2013;2.

16. Neumann M, Edelhäuser F, Tauschel D, Fischer MR, Wirtz M, Woopen C, et al. Empathy decline and its reasons: a systematic review of studies with medical students and residents. Academic Medicine. 2011;86(8):996-1009.

17. Shashikumar R, Chaudhary R, Ryali V, Bhat P, Srivastava K, Prakash J, et al. Cross sectional assessment of empathy among undergraduates from a medical college. medical journal armed forces india. 2014;70(2):179-85.

18. Lim BT, Moriarty H, Huthwaite M, Gray L, Pullon S, Gallagher P. How well do medical students rate and communicate clinical empathy? Medical teacher. 2013;35(2):e946-e51.

19. Newton BW, Barber L, Clardy J, Cleveland E, O'Sullivan P. Is there hardening of the heart during medical school? Academic Medicine. 2008;83(3):244-9.

20. Hojat M, Vergare MJ, Maxwell K, Brainard G, Herrine SK, Isenberg GA, et al. The devil is in the third year: a longitudinal study of erosion of empathy in medical school. Academic Medicine. 2009;84(9):1182-91.

21. Winseman J, Malik A, Morison J, Balkoski V. Students' views on factors affecting empathy in medical education. Academic Psychiatry. 2009;33(6):484-91.

22. van Ryn M, Hardeman RR, Phelan SM, Burke SE, Przedworski J, Allen ML, et al. Psychosocial predictors of attitudes toward physician empathy in clinical encounters among 4732 1st year medical students: A report from the CHANGES study. Patient education and counseling. 2014;96(3):367-75.

23. Magalhães E, Costa P, Costa MJ. Empathy of medical students and personality: evidence from the Five-Factor Model. Medical teacher. 2012;34(10):807-12.

24. Hojat M, Gonnella JS, Mangione S, Nasca TJ, Veloski JJ, Erdmann JB, et al. Empathy in medical students as related to academic performance, clinical competence and gender. Medical education. 2002;36(6):522-7.

25. Novack DH, Epstein RM, Paulsen RH. Toward creating physician-healers: fostering medical students' self-awareness, personal growth, and well-being. Academic Medicine. 1999;74(5):516-20.

26. Thomas MR, Dyrbye LN, Huntington JL, Lawson KL, Novotny PJ, Sloan JA, et al. How do distress and well-being relate to medical student empathy? A multicenter study. Journal of General Internal Medicine. 2007;22(2):177-83.

27. Novack DH, Suchman AL, Clark W, Epstein RM, Najberg E, Kaplan C. Calibrating the physician: personal awareness and effective patient care. Jama. 1997;278(6):502-9.

28. Dyrbye LN, Thomas MR, Shanafelt TD, editors. Medical student distress: causes, consequences, and proposed solutions. Mayo Clinic Proceedings; 2005: Elsevier.

29. Hope V, Henderson M. Medical student depression, anxiety and distress outside North America: a systematic review. Medical education. 2014;48(10):963-79.

30. Bayram N, Bilgel N. The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. Social psychiatry and psychiatric epidemiology. 2008;43(8):667-72.

31. Jadoon NA, Yaqoob R, Raza A, Shehzad MA, Zeshan SC. Anxiety and depression amon g medical students: a cross-sectional study. Journal of the Pakistan Medical Association. 2010 (60):699-702.

32. Dahlin M, Joneborg N, Runeson B. Stress and depression among medical students: A cross-sectional study. Medical education. 2005;39(6):594-604.

33. Hafferty FW. Beyond curriculum reform: confronting medicine's hidden curriculum. Academic Medicine. 1998;73(4):403-7.

34. Stewart SM, Lam T, Betson C, Wong C, Wong A. A prospective analysis of stress and academic performance in the first two years of medical school. Medical Education-Oxford. 1999;33(4):243-50.

35. Wolf TM, Faucett JM, Randall HM, Balson PM. Graduating medical students' ratings of stresses, pleasures, and coping strategies. Academic Medicine. 1988;63(8):636-42.

36. MacLeod R, Parkin C, Pullon S, Robertson G. Early clinical exposure to people who are dying: learning to care at the end of life. Medical education. 2003;37(1):51-8.

37. Silver HK, Glicken AD. Medical student abuse: incidence, severity, and significance. Jama. 1990;263(4):527-32.

38. Limpo T, Alves RA, Castro SL. Medir a empatia: Adaptação portuguesa do Índice de Reactividade Interpessoal. Laboratório de Psicologia. 2013;8(2):171-84.

39. Davis MH. Measuring individual differences in empathy: Evidence for a multidimensional approach. Journal of personality and social psychology. 1983;44(1):113.

40. Hills P, Argyle M. The Oxford Happiness Questionnaire: a compact scale for the measurement of psychological well-being. Personality and individual differences. 2002;33(7):1073-82.

41. Pais-Ribeiro J, Silva I, Ferreira T, Martins A, Meneses R, Baltar M. Validation study of a Portuguese version of the Hospital Anxiety and Depression Scale. Psychology, Health & Medicine. 2007;12(2):225-37.

42. Bjelland I, Dahl AA, Haug TT, Neckelmann D. The validity of the Hospital Anxiety and Depression Scale: an updated literature review. Journal of psychosomatic research. 2002;52(2):69-77.

43. Pais Ribeiro J, Marques T. A avaliação do stresse: a propósito de um estudo de adaptação da escala de percepção de stresse. Psicologia, Saúde & Doenças. 2009;10(2):237-48.

44. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. Journal of health and social behavior. 1983:385-96.

45. Bellini LM, Baime M, Shea JA. Variation of mood and empathy during internship. Jama. 2002;287(23):3143-3146.

46. Quince TA, Wood DF, Parker R A. Prevalence and persistence of depression among undergraduate medical students: a longitudinal study at one UK medical school. BMJ open. 2012;2(4):e001519.

47. Prinz Patrick. Burnout, depression and depersonalisation–psychological factors and coping strategies in dental and medical students. GMS Zeitschrift für medizinische Ausbildung. 2012;29(1)

48. Karaoglu N, M Şeker. Anxiety and depression in medical students related to desire for and expectations from a medical career. West Indian Medical Journal. 2010; 59(2):196-202

49. Wongpakaran N, Wongpakaran T. Research The Thai version of the PSS-10: An Investigation of its psychometric properties. 2010.

50. Crawford JR. Normative data for the HADS from a large non-clinical sample." British Journal of Clinical Psychology. 2001;40(4):429-434.

51. Cohen S. Who's stressed? Distributions of psychological stress in the United States in probability samples from 1983, 2006, and 2009. Journal of Applied Social Psychology. 2012;42(6):1320-1334.

52. Stratton TD, Justin A, Carol LE. Changes in medical students' emotional intelligence: An exploratory study. Teaching and Learning in Medicine. 2008;20(3):279-284.

53. Stratton TD. Emotional intelligence and clinical skills: preliminary results from a comprehensive clinical performance examination." Academic Medicine. 2005;80(10):S34 - S37.

54. Borges NJ. Emotional intelligence and medical specialty choice: findings from three empirical studies. Medical education. 2009;43(6):565-572.

55. Carrothers RM, Gregory JR, Gallagher TJ. Measuring emotional intelligence of medical school applicants. Academic Medicine.2000;75(5):456-463.

56. Aring CD. Sympathy and empathy. Journal of the American Medical Association. 1958;167(4):448-52.

57. Nightingale SD, Yarnold PR, Greenberg MS. Sympathy, empathy, and physician resource utilization. Journal of general internal medicine. 1991;6(5):420-3.

58. Cannon NM. Caring for the Patient. Journal of Hand Therapy. 1994;7(1):1-4.

59. Passalacqua SA, Segrin C. The effect of resident physician stress, burnout, and empathy in patient-centered communication during the long-call shift. Health communication. 2012;27(5):449-56

60. Mercer SW, McConnachie A, Maxwell M, Heaney D, Watt GC. Relevance and practical use of the Consultation and Relational Empathy (CARE) Measure in general practice. Family Practice. 2005;22(3):328-34.

61. Hogan R. Development of an empathy scale. Journal of consulting and clinical psychology. 1969;33(3):307.

62. Evans B, Stanley R, Burrows G. Measuring medical students' empathy skills. British Journal of Medical Psychology. 1993;66(2):121-33.

63. Mehrabian A, Epstein N. A measure of emotional empathy1. Journal of personality. 1972;40(4):525-43.

64. Stepien KA, Baernstein A. Educating for empathy. Journal of general internal medicine. 2006;21(5):524-30.

65. Winefield HR, Chur-Hansen A. Evaluating the outcome of communication skill teaching for entry-level medical students: does knowledge of empathy increase? Medical education. 2000;34(2):90-4.

66. Fine VK, Therrien ME. Empathy in the doctor-patient relationship: skill training for medical students. Academic Medicine. 1977;52(9):752-7.

67. Spiro H. What is empathy and can it be taught? Annals of Internal Medicine. 1992;116(10):843-6.

68. Shapiro J, Hunt L. All the world's a stage: the use of theatrical performance in medical education. Medical education. 2003;37(10):922-7.

69. Wilkes M, Milgrom E, Hoffman JR. Towards more empathic medical students: a medical student hospitalization experience. Medical education. 2002;36(6):528-33.

70. Batt-Rawden, Samantha A. Teaching empathy to medical students: an updated, systematic review. Academic Medicine. 2013;88(8):1171-1177.

71. Shapiro SL, Schwartz GE, Bonner G. Effects of mindfulness-based stress reduction on medical and premedical students. Journal of behavioral medicine. 1998 Dec;21(6):581-99. PubMed PMID: 9891256.

72. Rosenzweig S, Reibel DK, Greeson JM, Brainard GC, Hojat M. Mindfulness-based stress reduction lowers psychological distress in medical students. Teaching and learning in medicine. 2003 Spring;15(2):88-92. PubMed PMID: 12708065.

73. Greeson JM, Toohey MJ, Pearce MJ. An Adapted, Four-Week Mind-Body Skills Group for Medical Students: Reducing Stress, Increasing Mindfulness, and Enhancing Self-Care. Explore (New York, NY). 2015 Feb 16. PubMed PMID: 25792145. Epub 2015/03/21. Eng.

74. Ramirez A, Graham J, Richards M, Gregory W, Cull A. Mental health of hospital consultants: the effects of stress and satisfaction at work. The Lancet. 1996;347(9003):724-8

75. Weiner EL, Swain GR, Wolf B, Gottlieb M. A qualitative study of physicians' own wellness-promotion practices. Western Journal of Medicine. 2001;174(1):19

Agradecimentos

Agradeço à Doutora Margarida Figueiredo Braga, minha orientadora, pela sua disponibilidade, empenho e dedicação longo de todo o processo de elaboração do presente trabalho.

Agradeço ainda à minha família e amigos por todo o apoio incondicional e incentivo ao longo do meu percurso académico.

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