

1 ORIGINAL RESEARCH

2 Delgado et al

3 **What is the link between different components of**  
4 **empathy and burnout in healthcare professionals? A**  
5 **systematic review and meta-analysis**

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27 **Abstract:** Research on healthcare shows that the relationship between empathy and burnout is  
28 complex. The aim of this systematic review and meta-analysis is to clarify the link between different  
29 empathic components and burnout components in healthcare professionals. A systematic review  
30 was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and  
31 Meta-Analyses guidance. The search strategy was applied in PubMed, PsycINFO, CINAHL,  
32 Scopus, and Medline, from January 1990 to January 2021. Population included nurses and doctors.  
33 Key inclusion criteria were articles addressing the relationship between different components of  
34 empathy and professional performance and wellbeing or burn out, or studies using burnout and  
35 empathy measures with validity support from commonly accepted sources of evidence. Risk of bias  
36 was assessed using the *Mixed Methods Appraisal Tool*. From 1159 references identified, 22 studies  
37 were included in the systematic review, and 5 studies in the meta-analysis. Empathic Concern was  
38 significantly correlated with Depersonalization and Personal Accomplishment. Moreover, the links  
39 between Perspective Taking, Depersonalization and Personal Accomplishment were statistically  
40 significant. In conclusion, exploring and understanding the complex links between empathy and  
41 burnout could help healthcare professionals as well as institutions to reduce the risk of suffering  
42 burnout.

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44 **Keywords:** Burnout; Empathy; Healthcare professionals; Systematic review.

## 45 **Introduction**

46 Over the past few decades, advances in the behavioral sciences have generated numerous  
47 theories of empathy that attempt to explain a variety of different interconnected processes.  
48 However, despite the increasing knowledge developed in the last years, there is some  
49 controversy regarding the role of empathy in healthcare professionals' wellbeing, especially in  
50 burnout. In an attempt to unravel the reasons for these inconsistent results, here we analyse  
51 whether the components of empathy are differently related to each of the components of burnout  
52 in healthcare professionals (physicians and nurses) through a systematic review of the literature  
53 and a meta-analysis of the available data.

### 54 ***What is (and what is not) empathy?***

55 Empathy is a complex and multifaceted concept that has been described in the literature in many  
56 different ways<sup>1</sup>. The diversity in conceptual and operational definitions, and the unrestrained use

57 of the term “empathy”, make the scientific advancement in the field a challenge. In an extensive  
58 review of the concept, Cuff et al.<sup>2</sup> identified a total of 43 different definitions of the term empathy.  
59 For that reason, some researchers consider that empathy is an elusive term that describes a variety  
60 of distinct psychological phenomena<sup>3</sup>. Whereas some authors try to establish order by proposing  
61 a uniform definition to operationalise the construct<sup>2</sup>, other scholars have proposed that the word  
62 empathy should be replaced for the specific skills, traits, capacities, attitudes, responses, and  
63 behaviors that are represented in various definitions and measuring instruments<sup>4,5</sup>. Hall and  
64 Schwartz (2019) performed a quantitative review and conceptual analysis of empathy definitions  
65 through 489 studies published between 2001 and 2017. Considering the wide diversity of  
66 definitions, as well as inconsistencies between conceptual terms and measurements employed,  
67 they concluded that it is important to sidestep the term empathy in favor of lower-level terms that  
68 specifically describe what is being measured in each study. Unfortunately, the number of competing  
69 conceptualizations in the literature makes it difficult to determine which process or mental state the  
70 term empathy refers to in any study or theoretical debate<sup>3</sup>.

71         The difficulties linked to the definition of empathy are also transferred to its measurement.  
72 Among the instruments developed to assess empathy, the Interpersonal Reactivity Index<sup>6</sup> is  
73 undoubtedly one of the most used. According to Davis<sup>6</sup>, empathy may be understood to have four  
74 main components. Perspective-taking is the tendency to adopt others’ point of view or knowing  
75 another person’s internal states from a cognitive viewpoint, that is, knowing that the other is  
76 suffering. Empathic concern is related to abilities to experience feelings of warmth, compassion,  
77 and concern for other people, assessing the other-oriented approach of empathy with a positive  
78 emotional response to the suffering. Personal Distress component refers to a self-oriented  
79 approach to empathy, a negative emotion resonance towards suffering, including feelings of  
80 distress and unease when observing others’ suffering. A fourth component, called Fantasy, is  
81 included in IRI, and refers to the individual’s tendency to get involved with fictional characters and  
82 situations in books, movies, and play. Complementary, the Jefferson Scale of Empathy<sup>7</sup> has been  
83 broadly used for measuring empathy in the context of patient care. This scale has been translated  
84 into 47 languages and used in more than 70 countries. It contains three components of empathy:

85 Perspective Taking, Compassionate Care, and Walking in Patient's Shoes. Both instruments  
86 highlight the multifaceted conceptualization of empathy, and for that reason they offer the  
87 opportunity to explore the specific role of each of the components of empathy in burnout.

88 Supporting evidence for the complexity of empathy comes from social neuroscience  
89 research. Functional MRI (fMRI) studies have shown that empathic concern is associated with  
90 neural response in areas involved in social cognition and decision making such as the striatum and  
91 ventromedial prefrontal cortex. On the other hand, the empathic component of personal distress is  
92 associated with activity in the insula, amygdala and the somatosensory cortex, that is, circuits  
93 involved in saliency, emotional resonance, and affect processing.<sup>3</sup> These differences are in line  
94 with research on perspective taking showing that the same brain areas involved in the affective and  
95 motivational processing of the direct (own) perception of pain are involved in the perception of the  
96 pain of others. Specifically, the fact that the observation of pain in others activates the brain  
97 structures involved in negative emotional experiences has important consequences regarding  
98 whether that observation will lead to empathic concern or personal discomfort. Despite the same  
99 neural circuits are activated when people adopt the self-perspective and the perspective of others,  
100 the frontal lobes may facilitate the distinction of perspectives, assisting one to keep from intrusions  
101 from one's own perspective when adopting other's perspective<sup>34,35</sup>. This is especially relevant when  
102 observing other's suffering and could explain the differences between self-other awareness linked  
103 with personal distress and empathic concern.

## 104 ***The role of empathy in burnout***

105 Research has shown that clinician's empathy is a central element in healthcare context<sup>8</sup>,  
106 with a strong impact in patient's satisfaction and adherence to treatments<sup>9</sup>. Whereas clinician's  
107 empathy positively affects the patients' overall well-being and contributes to their healing, it is less  
108 clear what is the effect of empathy in healthcare professionals' well-being. There is a wide variety  
109 of ways in which empathy seems to add value to medical practice. Unfortunately, very few  
110 components in formal medical and nursing training focus on how to manage emotions<sup>3</sup>.  
111 Undoubtedly, empathy is an extremely difficult phenomenon for doctors and nurses, who day after

112 day must cope with intense suffering from patients. Healthcare professionals face the challenge of  
113 devoting the right balance of cognitive and emotional resources to their patients' pain experience,  
114 for their own wellbeing as well as for their patients' wellbeing. Healthcare professionals must deal  
115 with their emotional reactions to stress and others' suffering, they are witnesses to highly  
116 demanding clinical situations day after day.

117 From a theoretical approach, one of the assumptions about empathy in healthcare is that  
118 there are emotional costs for displaying an empathic approach day after day towards patients and  
119 their families<sup>10,11</sup>. Specifically, one of these personal costs linked to empathy has been the burnout  
120 syndrome<sup>12,13</sup>.

121 The burnout syndrome can be defined as a prolonged response to chronic stressors at  
122 work that includes physical depletion, feelings of helplessness, negative attitudes towards work,  
123 life, the self, and others<sup>14,15</sup>. There is a strong scientific consensus on the multidimensionality of  
124 burnout<sup>16</sup>. A central component of burnout is emotional exhaustion, a felt depletion of emotional  
125 energy and resources<sup>17,18</sup>. The second component of burnout is the development of  
126 depersonalization, which could lead to the view that patients deserve what they suffer. Finally, the  
127 lack of personal accomplishment is conceived as the tendency to evaluate oneself negatively, with  
128 feelings of unhappiness at work<sup>19</sup>.

129 Burnout is considered one of the main problems for quality of life in healthcare  
130 professionals<sup>20</sup>. The high levels of burnout in physicians and nurses<sup>21,22</sup> are considered a threat to  
131 the professionals themselves, but also to their patients and the organizations where they work<sup>23</sup>.  
132 This syndrome involves severe health problems, such as anxiety, depression, irritability, changes  
133 in mood, insomnia, and drug use<sup>24</sup>, as well as reduced productivity, increased turnover, and  
134 increased costs to the healthcare system<sup>21,25</sup>.

135 Notwithstanding its interest for both healthcare professionals and patients, findings of the  
136 specific role of empathy and related processes in burnout are inconsistent<sup>26</sup>. To explain the  
137 relationship between burnout and empathy, Zenasni et al.<sup>27</sup> proposed three theoretical hypotheses:  
138 (1) burnout reduces the ability of clinicians to respond empathically; (2) being empathic draws  
139 significantly on personal resources and thus causes burnout; and (3) being empathic protects

140 clinicians from burnout. However, empirical evidence about the impact of empathy in burnout is  
141 inconclusive<sup>10,28,29</sup>. Whereas several studies have reported a positive relationship between  
142 empathic concern and burnout<sup>30</sup>, other studies found a negative relationship between burnout and  
143 empathy among primary care physicians and nurses<sup>28,31</sup>. In the same vein, a systematic review of  
144 10 studies correlating empathy and burnout in healthcare professionals concluded that most of the  
145 studies provided empirical support for a negative relationship between empathy and burnout; one  
146 study showed a positive relationship between burnout and empathy, and one study reported  
147 contradictory evidence with positive and negative correlations between different subscales of the  
148 empathy and burnout measures<sup>26</sup>. Likewise, Williams et al.<sup>32</sup> found similar conclusions in a scoping  
149 review.

150 In their research, Wilkinson et al.<sup>26</sup> considered that the original three hypotheses from  
151 Zenasni et al.<sup>27</sup> could be reduced to 1) there is a negative association between burnout and  
152 empathy (as one construct increases the other decreases), and 2) there is a positive association  
153 between burnout and empathy (high burnout is associated with high empathy). However, there are  
154 a large number of possibilities that are not being considered, such as that each component of  
155 empathy could play a particular role in each component of burnout. The importance of analyzing  
156 the relationships between each component of burnout and each component of empathy lies in  
157 increasing the possibilities to reduce the risk of suffering burnout and promoting empathic skills that  
158 mitigate the effect of exposure to constant suffering.

## 159 ***The present research***

160 The COVID-19 pandemic has brought an extremely pressure on hospitals, with specialists seriously  
161 affected for the terribly hard conditions to work that they suffered. Undoubtedly, the pandemic has  
162 accentuated the need to deal with the emotional wellbeing and stress-related problems of  
163 healthcare professionals. But even before this critical period, health problems among healthcare  
164 professionals resulting in compassion fatigue, burnout, and professional distress were  
165 unacceptably common. The need to cope with emotionally distressing situations day after day could  
166 be part of the problem<sup>3</sup>. In this line, the purpose of this study is to analyze the link between empathy

167 and burnout by considering their specific components instead of the general measure of each of  
168 the concepts.

169 Most studies that explore the relationship between empathy and burnout have important  
170 limitations. In healthcare contexts, limitations of correlational studies, characteristics of the  
171 samples, potential biases, and type of measurement instruments used to explore empathy make it  
172 difficult to get determine the role of empathy in burnout. As Clark et al.<sup>36</sup> pointed out, most of studies  
173 do not reflect the multidimensionality of empathy, which has undermined the advancement in the  
174 study of differential effects of each of the empathic components on other relevant phenomena. For  
175 those reasons, a systematic review and meta-analysis could be especially useful in obtaining  
176 consistent conclusions regarding the links between empathy and burnout in healthcare.

177 Specifically, this research aims at identifying whether the components of empathy are  
178 differently related to each of the components of burnout in both physicians and nurses. More  
179 precisely, the research question was formulated as follows: In healthcare professionals (doctors  
180 and nurses), are the components of empathy (e.g., perspective-taking, empathic concern, and  
181 personal distress) differently related to each of the components of burnout (emotional exhaustion,  
182 depersonalization, and lack of accomplishment)?

## 183 **Material and methods**

184 This research was developed following the PRISMA (Preferred Reporting Items for Systematic  
185 Reviews and Meta-Analyses <http://www.prisma-statement.org/>) guidelines, and PRISMA checklist  
186 is available in supplementary file 1. Data were analyzed using R, version 4.0.0<sup>37</sup> and the  
187 package meta<sup>38</sup>, package metacor<sup>39</sup> and package metaphor<sup>40</sup>. The protocol for this systematic  
188 review and meta-analysis on the link between different components of empathy and burnout was  
189 registered with the online database PROSPERO (CRD42021235359).

### 190 ***Search strategy***

191 We sought both quantitative and qualitative empirical studies. Full details of the search strategy are  
192 accessible in supplementary file 2. The search was focused on publications from January 1990 to  
193 October 2022, and it was carried out between October 29<sup>th</sup> 2020 and October 1<sup>st</sup> 2022. The

194 databases consulted with language restrictions to English or Spanish (when possible) were  
195 PubMed, PsycINFO, CINAHL, Scopus, and Medline. Four authors participated independently in  
196 the relevance assessment of retrieved articles, first by title and abstract, and then by full text.

197         The primary outcome was to clarify the relationship between different components of  
198 empathy and consequences in both performance and professional well-being with a special focus  
199 on burnout, in healthcare professionals (doctors and nurses). Additional outcomes were a) to  
200 identify the role of different components of empathy in healthcare providers' experiences of burnout,  
201 and b) to identify interventions related to empathy in healthcare providers, the evidence for these,  
202 and their outcomes. Full details of the inclusion and exclusion criteria are described in  
203 supplementary file 2. In brief, key inclusion criteria were articles addressing the relationship  
204 between different components of empathy and professional performance and wellbeing, burnout  
205 or moral distress, or studies to provide specific data about the relationship between burnout and  
206 empathy using burnout and empathy measures with validity support from commonly accepted  
207 sources of evidence. Population included nurses and doctors, including residents. Studies  
208 conducted with healthcare professionals different from doctors and nurses, such as nurse  
209 assistants, paramedics, pharmaceuticals, clinical psychologists, physiotherapists, ambulance  
210 technicians, were excluded. Students also were excluded since the research focuses in  
211 professional contexts. Studies estimating rates of burnout in general or studies considering just  
212 empathy without differentiation of empathic components were excluded. The articles were  
213 screened by two authors independently and in duplicate, following the inclusion and exclusion  
214 criteria. Articles were first screened by title and abstract, and secondly by full text reading.  
215 Disagreements were discussed by the four authors, and an agreement reached.

## 216 ***Data extraction***

217 Data extraction and quality assessment were undertaken by two authors independently and in  
218 duplicate using a table developed by the authors ad hoc to facilitate the data extraction and to  
219 gather relevant information. The two reviewers independently and in duplicate collected data from  
220 reports, the results were compared, and a synthesis was done. The quality assessment of the



221 selected studies was performed with the *Mixed Methods Appraisal Tool* (MMAT)<sup>41</sup> (supplementary  
222 file 3).

## 223 **Results**

224 A total of 1982 references were identified. After checking for duplicated articles and executing an  
225 initial review for four reviewers by title and abstract, 76 articles were selected to screen by full text.  
226 Finally, 23 articles met the criteria for inclusion (see Figure 1).

### 227 ***Study characteristics***

228 The characteristics of the selected studies are shown in Table 1. Most of the papers (12) were from  
229 Europe or the UK, whilst 7 were from the USA, 3 papers were from Asian countries, and one paper  
230 was from Israel. Of the 23 included papers, 6 were performed in both nurses and physicians, while  
231 only 4 were performed exclusively in nurses, 13 studies were conducted only in doctors. Of those,  
232 the majority (9) was performed with residents, and the remaining 4 with specialists in different fields.

233 The 23 reviewed articles differed in terms of research design. Fifteen of them described  
234 cross-sectional studies: 13 studies were correlational designs<sup>8,23,50–52,42–49</sup>, one was a cohort  
235 study<sup>53</sup>, and one was an observational study<sup>54</sup>. Four studies included an interventional design,  
236 using one of them a randomized experiment with a control group<sup>55</sup>, whereas the other three were  
237 quasi-experimental studies<sup>56–58</sup>. Four articles described a longitudinal cohort design<sup>59–62</sup>.

238 The Maslach Burnout Inventory (MBI) was the most common instrument used to measure burnout  
239 levels in healthcare professionals, although six studies utilized a version of the original scale, such  
240 as MBI-General Service<sup>8</sup>, MBI-Human Service Survey<sup>52,53,55</sup>, an abbreviated version of MBI<sup>48</sup> and  
241 a Danish adaptation composed of 20 items<sup>55</sup>. As Personal Accomplishment can be expressed as  
242 a positive achievement (e.g. <sup>45,51</sup>) or as a reduced self-development (e.g. <sup>46,49</sup>), for clarity of findings,  
243 it is reported through the results section as a reduced Personal Accomplishment. The Oldenburg  
244 Burnout Inventory (OLBI)<sup>67</sup> was utilized by one study<sup>23</sup>. This instrument<sup>67</sup> comprises two components  
245 of burnout: exhaustion and disengagement. All articles break their findings down into components  
246 of burnout, except for one that calculated it as a global variable<sup>48</sup>. Moreover, one study<sup>62</sup> used the

247 Copenhagen Burnout Inventory (CBI<sup>63</sup>), which is composed by three subscales: Personal burnout  
248 (general state of prolonged physical and psychological exhaustion), Work-related burnout, and  
249 Patient-related burnout.

250 In contrast, a variety of instruments were used to assess empathy. Interpersonal Reactivity  
251 Index (IRI)<sup>6</sup> was utilized by 12 studies<sup>8,42,61,44–49,51,60</sup> although some of them only evaluated some of  
252 the components of the scale. For example, Omdahl and O'Donnell<sup>49</sup> and Kelly-Hedrick et al.<sup>47</sup>  
253 measured Empathic Concern, while Winkel et al.<sup>58</sup> assessed Empathic Concern and Perspective  
254 Taking, and Reed et al.<sup>60</sup> included both Empathic Concern and Personal Distress. Likewise, the  
255 component of Fantasy is frequently excluded from the assessment, but it has been evaluated in  
256 some studies (e.g.<sup>51</sup>). Moreover, one article reports the results of empathy as a single global score,  
257 although all their components, except Empathic Concern, were evaluated<sup>8</sup>. Nine studies<sup>43,50,52–57,59</sup>  
258 used the Jefferson Scale of Physician Empathy (JSPE)<sup>7</sup>. Although this measure consists of three  
259 components, it is frequently analyzed as a single variable (e.g.<sup>43,53,54</sup>). The Basic Empathy Scale  
260 short version (BES-A)<sup>68</sup>, which comprises two components (affective and cognitive empathy) was  
261 used by one study<sup>23</sup>. Altmann and Roth<sup>62</sup> assessed empathy through three instruments: The  
262 Toronto Empathy Questionnaire (TEQ<sup>64</sup>), as a measure of affective empathy, the Geneva Emotion  
263 Recognition Test (GERT<sup>65</sup>) that is a computer-based test to examine the ability to correctly detect  
264 emotions in other people, and the Social Mindfulness Paradigm (SOMI<sup>66</sup>), which is another  
265 computer-based procedure to measure prosocial behavior as recognizing the needs and wishes of  
266 others.

### 267 ***Links between Burnout and IRI Empathy Components***

268 Five studies of those that used the IRI reported correlations between components of empathy and  
269 burnout<sup>45,46,51,60,61</sup> with consistent results. All of them found that Depersonalization was negatively  
270 correlated to Perspective Taking. In addition, four studies<sup>45,46,51,61</sup> showed that Depersonalization  
271 was also negatively associated with Empathic Concern, and a reduced Personal Accomplishment  
272 was negatively correlated with Perspective Taking. Three studies<sup>45,46,51</sup> found that Emotional  
273 Exhaustion was positively linked to Personal Distress. Moreover, two studies showed a significant  
274 and positive correlation between Personal Distress and reduced Personal Accomplishment<sup>45,46</sup>.

275 Likewise, two papers noted that Empathic Concern was negatively related to reduced Personal  
276 Accomplishment<sup>45,61</sup>. Although Ren et al.<sup>8</sup> also indicated correlations between burnout and  
277 empathy, findings were reported through IRI total score.

278         Regarding regressions, five studies reported these analyses<sup>8,45,48,49,51</sup>, but results were  
279 inconsistent. While a study found that Empathic Concern predicted high levels of Emotional  
280 Exhaustion<sup>51</sup>, this link was statistically non-significant in two other papers<sup>45,49</sup>. Omdahl and  
281 O'Donnell<sup>49</sup> only measured Empathic Concern as a component of empathy and is the only one that  
282 has shown Empathic Concern also predicted low levels of reduced Personal Accomplishment and  
283 Depersonalization. Perspective Taking predicted low levels of Depersonalization<sup>45,51</sup>, Emotional  
284 Exhaustion<sup>51</sup>, and reduced Personal Accomplishment<sup>45</sup>. Likewise, only the study of Delgado et al.<sup>45</sup>  
285 indicated that Personal Distress predicted high levels of Emotional Exhaustion, and a low reduced  
286 Personal Accomplishment. McManus et al.<sup>48</sup> examined the MBI as a single dimension without  
287 finding significant links between it and empathy components, while Ren et al.<sup>8</sup> also reported  
288 regressions through IRI total score.

289         Four studies measured both burnout and empathy through their components<sup>42,44,47,58</sup>,  
290 however, they were not focused on exploring the association between these variables, therefore  
291 these findings were not reported.

## 292 ***Links between Burnout and JSPE Empathy Components***

293 Although the JSPE is a common instrument to assess empathy in healthcare professionals, the  
294 literature tends to describe their findings joining the components as a single score. This is the case  
295 of three of the reviewed studies<sup>43,53,54</sup>.

296         Only three studies exposed their results by components of empathy and burnout<sup>50,52,59</sup>. All  
297 of them reported that Perspective Taking was negatively linked to reduced Personal  
298 Accomplishment, also finding this correlation in transversal and longitudinal analyses<sup>59</sup>. In addition,  
299 Sturzu et al.<sup>52</sup> indicated that Compassionate Care and Standing in the Patient's Shoes components  
300 were negatively related to Depersonalization, and Standing in the Patient's Shoes was also  
301 negatively associated with low levels of Personal Accomplishment.

302 As happened with studies that used IRI, three articles were aimed to examine the effect of  
303 an intervention in several variables, such as burnout and empathy, but their results do not inform  
304 of links between components of both scales<sup>55-57</sup>.

### 305 ***Links between Burnout and other Empathy Components***

306 Only one study examined empathy components with the BES-A instrument, separately analyzing  
307 nurses and doctors<sup>23</sup>. Its findings showed that Cognitive Empathy was negatively correlated to  
308 Disengagement in doctors, while Affective Empathy was positively linked to Emotional Exhaustion  
309 in nurses. Results of regression analyses indicated that Affective Empathy predicted high levels of  
310 Emotional Exhaustion, whereas Cognitive Empathy was unrelated to components of burnout both  
311 in nurses and doctors.

312 Altmann and Roth<sup>62</sup>. analyzed the link between empathy and burnout was analyzed in a nursing  
313 sample. Cross-sectional correlations indicated that Affective Empathy was positively related to  
314 Personal Burnout, but negatively associated with Patient-related Burnout. Longitudinal findings  
315 showed that Work-related Burnout predicted Emotion Recognition, while Patient-related and  
316 Personal Burnout predicted Prosocial Behavior related to affection identification of others. By  
317 contrast, there were no significant cross-lagged relation between Affective Empathy and Burnout  
318 dimensions.

### 319 ***Meta-analysis with correlations***

320 A separate meta-analysis was performed for each Empathy-Burnout subscales correlation using  
321 the metaphor package in R<sup>40</sup>. This meta-analysis meets all the criteria Cochrane Consumers and  
322 Communication Group reviews for meta-analysis<sup>68</sup>. Only 5 studies<sup>45,46,52,60,61</sup> reported enough data  
323 about subscales to be included in the meta-analysis. For each pair of correlations, a random-effects  
324 model using the unweighted mean  $r$ , which is based on  $ks$  (the total number of studies), was applied  
325 because it indicates whether the variance in effect sizes is no greater than what would be expected  
326 by sampling error and, therefore, it allows the generalization of the findings. Effect sizes were  
327 estimated applying an algorithm of maximum likelihood (ML). The effect size  $r$  is used here because  
328 it represents both the strength and direction of the associations. All calculations involving  $r$  were

329 performed by first transforming  $r$  to the Fisher's  $z$  transformation of  $r$ , and then returning results to  
330 the  $r$  metric. Measures for estimating the amount of heterogeneity were computed<sup>70</sup>.

331 Results revealed that Empathic Concern was significantly and negatively correlated with  
332 Depersonalization, and positively correlated with Personal Accomplishment. Moreover, the links  
333 between Perspective Taking and Depersonalization and Personal Accomplishment were  
334 statistically significant (see Table 2). Results revealed that effect size for the relationship between  
335 Empathic Concern with Depersonalization was significant [-0.252,  $p < 0.01$ ]. The same significant  
336 effect size was found for Empathic Concern and Personal Accomplishment [0.13  $p < 0.01$ ].  
337 Moreover, the effect size links between Perspective Taking and Depersonalization [-0.27,  $p < 0.01$ ]  
338 and Personal Accomplishment [0.30  $p < 0.01$ ] were significant. Confidence interval for tau  
339 heterogeneity index was included for different size effect tested (see Table 2).

340 Figure 2 shows the forest plot of correlations statistically significant. Heterogeneity indexes  
341 were moderate-high, indicating variability across the studies. The highest levels of variability were  
342 due to the inclusion of Fülöp et al.<sup>46</sup>, with prediction of a negative correlation between Empathic  
343 Concern and Personal Accomplishment, as well as Perspective taking and Depersonalization, with  
344 a small sample size.

## 345 Discussion

346 This systematic review and meta-analysis explored the relationship between the different  
347 components of empathy and each of the different components of burnout in doctors and nurses.  
348 As expected, the findings were complex. Specifically, results indicated that healthcare  
349 professionals with high levels of Personal Accomplishment also show high levels of Perspective  
350 Taking, Empathic Concern and Standing in the Patient's Shoes. On the other hand, results  
351 supported a negative association between Depersonalization and Perspective Taking, Empathic  
352 Concern, Compassionate Care, and Standing in the Patient's Shoes. Together, these results  
353 highlight the importance of studying different components of empathy separately, since their impact  
354 on burnout components are different.

355           Among the three components of burnout, Emotional Exhaustion is the least related to  
356 empathy components; three studies reported a positive correlation between Personal Distress and  
357 Emotional Exhaustion. According to the job demands-resources model of burnout<sup>71</sup>, these results  
358 could suggest that exhaustion would be more linked with demands than with resources, and  
359 highlight the relevance to explore specific predictors of Emotional Exhaustion by differentiating it  
360 for the rest of components of burnout.

361           The pattern of results obtained with Personal Distress considerably differs from the rest of  
362 empathic components. This finding underlines the important differences across components that  
363 constitute empathy and invites to rethink whether all of them are actually part of what we call  
364 empathy. Besides, this result is in line with previous research showing that negative self-oriented  
365 emotions elicited by perceiving others' suffering were associated with burnout and compassion  
366 fatigue<sup>12, 72</sup>. In this sense, there are two distinct ways in which people can take the perspective of  
367 others' suffering. One form is thinking about how a suffering other feels or imagine-other  
368 perspective-taking (IOPT), and the other form is imagining oneself in the suffering other's place or  
369 imagine-self perspective-taking (ISPT). A novel line of research suggests that empathy is less due  
370 to self–other merging (or a blurring in the distinction between the two), but rather that it is motivated  
371 by the recognition that the self is distinct from the other, and that one's experience is distinct from  
372 the experience of others<sup>34,73</sup>. Furthermore, social neuroscience research would help to increase  
373 the knowledge of the role of empathic components in burnout. More studies that clarify the role of  
374 the frontal lobes in avoiding intrusions from one's own perspective when adopting other's  
375 perspective could be essential to clarify differences between personal distress and the rest of  
376 components of empathy. Together, these promising lines of study could lead to deep understand  
377 the central role of the self-other merging versus distinctiveness perspective in empathy and their  
378 relationship with burnout.

379           As we have confirmed with this study, most research that explores empathy in the  
380 healthcare context does not differentiate what type of empathy is studied. This lack of specificity  
381 makes it difficult to understand and identify what is the role of empathic components in burnout.  
382 Importantly, results indicate that it is not necessary to reduce the empathic approach towards

383 patients to decrease burnout. Instead of that, it is essential to identify which empathic component  
384 is unfolding for healthcare professionals and try to promote perspective taking and empathic  
385 concern. However, results indicate that personal distress should be minimised in healthcare  
386 contexts. **In this line, working at identifying the different empathic approaches in healthcare is a key  
387 element to improve interventions aimed at supporting healthcare professionals' wellbeing. Other  
388 ways to deal with the differential effect of the empathic components imply the improvement of  
389 specialized training and communication about the differences and specific effects of each of the  
390 empathic components.**

391 We emphasize that only five studies (from a total of initial 1982 references) show the  
392 relationships between the components of IRI and Burnout, which was the main objective of this  
393 study. The absence of studies that show data on the relationship between empathy and burnout  
394 components might be a limitation among the published studies that have used these scales and  
395 have not given data on the correlation between them, or, as in most cases, these correlations were  
396 out of their scope. Hence, we claim that there is a need for research to show data on the correlation  
397 between the different dimensions of burnout and empathy using relevant instruments in the field.

398 From all the studies that we screened, none of them paid particular attention to the  
399 circumstances of the pandemic. What we have seen is that most of the studies carried out during  
400 the pandemic about burnout focused more on the relationship between burnout and working  
401 conditions under the pressure of the pandemic, and the relationship between burnout and some  
402 mindfulness practices, instead of the relationship with empathy in the circumstances of the  
403 pandemic. While these two areas are also interesting, those are out of our scope. It could be  
404 interesting to address how the relationship between the different dimensions of burnout and  
405 empathy are related under specific conditions such as the pandemic. However, the very difficult  
406 circumstances that the healthcare workers have experienced may have made it difficult to carry out  
407 some studies, so as not to overwhelm them with more questionnaires to fill out.

408 Our results constitute an advance in the knowledge of the links between empathy and  
409 burnout with relevant implications. From a theoretical approach, scholars usually link empathy to  
410 negative consequences for healthcare professionals (e.g.<sup>11,13</sup>), while empirical work leads to more

411 precise conclusions, revealing that the type of empathic component is crucial to determine potential  
412 personal costs when displaying empathy in healthcare contexts. In this way, and in line with recent  
413 recommendations (e.g.<sup>36</sup>), the current study emphasizes the importance to continue in the  
414 advancement of the distinction between empathic components and other related concepts, such  
415 as compassion<sup>74</sup> and concern <sup>75</sup>. Therefore, future research should separately examine empathic  
416 and burnout components instead of considering them as a single factor. In addition, empirical  
417 research examining the components of empathy and potential associated emotional dysfunctions  
418 among healthcare professionals may be a key element to develop effective educational  
419 interventions for medical and nursing students.

420         Furthermore, this study has also a relevant practical impact. On the one hand, healthcare  
421 professionals need to handle the emotional costs of their work and the risk of suffering burnout.  
422 During the Covid-19 pandemic, healthcare professionals are facing important emotional demands,  
423 including grief from seeing so many patients die, fears of contracting the virus and infecting their  
424 family members, and anger over healthcare disparities and other systems failures<sup>76</sup>. These  
425 stressors have triggered or intensified burnout, depression, or anxiety, as well as the fear of  
426 suffering for displaying empathy, which also have negative consequences<sup>77</sup>. On the other hand,  
427 the study of the role of empathy in burnout could reformulate the way professionals think toward  
428 their own work. The culture of medicine in particular and healthcare in general reinforces the belief  
429 that physical and emotional exhaustion are part of the job<sup>76</sup>. Exploring and understanding the  
430 complex links between empathy and burnout could help healthcare professionals as well as  
431 institutions to reduce the risk of suffering burnout.

432         There are some limitations that should be considered when interpreting the conclusions.  
433 Recognizing the diversity of expressions that can be considered as components of empathy, it is  
434 possible that some terms have been left out of the search strategy. However, the authors tried to  
435 include all relevant terms. Furthermore, the current review only included studies in English and  
436 Spanish, which means that there may be other relevant studies that have been conducted and  
437 published in languages other than these. An important limitation of this review is also that many of  
438 the studies do not report correlations between components, which means a lack of reported data



439 necessary to include the studies in the meta-analysis. We contacted the authors of the studies  
440 included in the SR to request the data, but we only obtained the data from one study<sup>61</sup>. Another  
441 limitation is that some of the studies included do not report the results separately for profession,  
442 and only in some of these studies it was possible to have the separate data after contacting the  
443 authors. Importantly, the studies included in this review have heterogeneous samples of both  
444 physicians and nurses, with different functions, responsibilities, and experience. Therefore, part of  
445 the difference in the results of review studies might be due to considering different groups of  
446 physicians and nurses equally and integrating their data.

447         Moreover, although the inclusion criteria contained papers that had qualitative or mixed  
448 methodology, in addition to quantitative one, the comparison of studies that utilized standardized  
449 psychometric assessments to measure the constructs was only possible and more reliable through  
450 quantitative designs. While qualitative studies can provide a richness of data that is lost in the  
451 numerical values assigned in standardized measures, in this review we found that no one of the  
452 qualitative studies potentially selected could be included because none of them reported results  
453 regarding the relationship between the different components of burnout and empathy. It should be  
454 noted that, while all the included studies have used MBI to measure burnout, the diversity of  
455 instruments to capture empathy have made this systematic review more difficult to carry out.

456         Finally, the use of self-reported measures of empathy in the studies leads to a series of  
457 limitations that should be considered. Recent research has shown that self-reports of empathy  
458 seem to be unrelated with empathic abilities<sup>78,79</sup>. It is important to complement the use of self-  
459 reported measures of empathy with other measures, such as physiological or neurological  
460 measures, as well as measures provided by patients and colleagues.

## 461 **Conclusion**

462         Under the term empathy, a multitude of processes and different phenomena are collected.  
463 Therefore, it is expected that this set of differentiated processes will give rise to different effects on  
464 burnout, and more specifically, on each of its components. In recent years, numerous studies have  
465 identified the neurobiological mechanisms underlying the various elements grouped under the

466 concept of empathy in the field of healthcare. More research will help to clarify the complex links  
467 between each of these elements and each of the burnout components, as well as the way they are  
468 influenced by the type of clinical task, service or unit where healthcare professionals are involved,  
469 and other mediated factors. The development of empirical knowledge about the role of empathy in  
470 burnout is relevant for multiple reasons. Undoubtedly, this systematic review led to the conclusion  
471 that more research is needed to disentangle the specific contribution of empathic components in  
472 burnout.

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## 476 **Disclosure**

477 The author reports no conflicts of interest in this work.

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719

720 **Figure 1**

721 *Systematic review flow diagram adopted in this study based on the Preferred Reporting Items*  
722 *for Systematic Reviews and Meta-Analysis (PRISMA)*

723

724 **Figure 2**

725 *Forest Plot for Estimates of the Effects of Significant Correlations between Empathy and*  
726 *Burnout*