

# An exploratory cross-sectional study on the relationship between dispositional mindfulness and empathy in undergraduate medical students

## Abstract

**THEORY** There is a growing interest in identifying the psychological variables that promote and sustain empathy in medical students during their studies. Dispositional mindfulness has been shown to be empirically associated with socio-demographic characteristics and empathy among the general population. This research aimed to assess dispositional mindfulness in a sample of undergraduate medical students and to investigate its association with gender, age and empathy. **HYPOTHESES** It is hypothesized that male medical students would show, on average, higher dispositional mindfulness than their female counterparts, and that older students would exhibit higher dispositional mindfulness than younger ones. Dispositional mindfulness was also expected to be positively associated with the ability to feel compassion for others and to adopt their perspective, and negatively associated with the personal distress in tense interpersonal settings. **METHOD** An exploratory cross-sectional study was conducted. Data were gathered from a large sample ( $N = 933$ ) of Italian non-meditating second- and fifth-year medical students. Dispositional mindfulness and empathy were assessed using the Five-Facet Mindfulness Questionnaire and the Interpersonal Reactivity Index, respectively. Gender and age differences in dispositional mindfulness scores were calculated by analyses of variance, whereas hierarchical multiple regression models were used to assess the association between dispositional mindfulness and empathy scores. **RESULTS** Female medical students were more able to *Act with Awareness* than males, whereas males had higher levels than females of *Describing* and *Nonreactivity* to their feelings. When compared to their older counterparts, younger students scored higher on *Observing* and lower on *Nonreactivity* facets. Dispositional mindfulness facets correlated differently with both emotional and cognitive empathy dimensions, beyond the effects of gender and age. Medical students who displayed higher dispositional mindfulness appeared to be less emotionally distressed in tense interpersonal settings and more able to take others' cognitive perspective. **CONCLUSIONS** The findings support the notion that dispositional mindfulness is related to empathy and may have implications for the design of mindfulness-based training for use in the medical educational setting. Tailored interventions that cultivate specific dispositional mindfulness facets may be implemented along the medical curriculum to prevent the emotional distress in tense interpersonal settings and to sustain the cognitive capability to take others' viewpoints among medical students.

**Keywords:** dispositional mindfulness; empathy; medical students; Five Facet Mindfulness Questionnaire; Interpersonal Reactivity Index

## 1. Introduction

Empathy can be considered a multidimensional construct involving emotional as well as cognitive domains.<sup>1,2</sup> The emotional component concerns the capacity to share others' experiences and feelings.<sup>3,4</sup> On the other hand, the cognitive domain of empathy is based on the capability of understanding the other's perspective in terms of thoughts, personal experiences, perceptions and worries.<sup>5,6</sup> Empathy in medicine is associated with improved adherence to treatment,<sup>7</sup> better clinical outcomes<sup>8,9</sup> and higher patient satisfaction.<sup>10</sup> Studies conducted with medical students reported that empathy was correlated positively with patient-centeredness<sup>11</sup> and negatively with burnout,<sup>12,13</sup> depicting empathy as a protective factor against the psychological distress among medical and healthcare students<sup>14-16</sup> and professionals.<sup>17</sup>

In light of these clinical outcomes, there is a growing interest in identifying the psycho-attitudinal variables<sup>18-20</sup> that assist medical students in developing empathy during medical studies. Many studies have considered the effects of mindfulness-based interventions in healthcare education<sup>21,22</sup> and its relationship with empathy.<sup>23-29</sup> Mindfulness has been defined as “awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally, to the unfolding of experience moment by moment”.<sup>30(p145)</sup> This attitude could be conceptualized as a temporary state of consciousness induced by practice and training<sup>31</sup> or as a personal trait (dispositional mindfulness – DM) seen as the natural and spontaneous ability to be mindful without any previous training.<sup>32</sup> Baer and colleagues<sup>33</sup> proposed a five-facet model of DM: (1) *Observing* internal and external stimuli; (2) *Describing* and labelling inner and external stimuli; (3) *Acting with Awareness*; (4) being *Nonjudging* of inner experiences; and (5) *Nonreactivity* to inner experiences. In the literature DM has been associated with socio-demographic characteristics such as gender and age: females generally show more difficulties in being mindful than males,<sup>34,35</sup> whereas older individuals score higher in all or some facets of DM than younger ones.<sup>36,37</sup>

Mindfulness has been defined as a compassionate, friendly and heartfelt attitude.<sup>38-40</sup> A

mindful stance leads people to be authentically kind and curious about their own experiences. Mindful people can be in touch with their own feelings and difficulties and are more able to deal with those of others.<sup>41,42</sup> Based on this conceptual framework, several studies<sup>43–46</sup> have recently investigated the empirical association between DM facets and empathy dimensions in the general population. However, evidence from the literature showed that the relationship between DM and empathy is, in most cases, weak and inconsistent, and may depend on the different dimensions of DM and empathy that are studied and the instruments employed to assess them.<sup>46</sup> In this regard, a recent study suggested that the association between DM and empathy may also depend on behavioral (e.g., meditation practice) and psychological (e.g., emotion regulation) variables that mediate/moderate the link between these two theoretical constructs.<sup>46</sup> Therefore, to date the mechanisms through which DM is associated with empathy are not well understood.

In the health context, DM has been studied in relation to psychological health,<sup>41</sup> self-compassion,<sup>47</sup> prosocial behaviour,<sup>48</sup> stress and burnout:<sup>49</sup> higher levels of DM are associated with lower work-related stress and higher other-oriented behaviors. Despite the large number of studies<sup>50</sup> that have investigated the effect of mindfulness-based training on the well-being and empathy of health professionals<sup>25,29</sup> and students,<sup>24,26</sup> to the best of our knowledge there are no studies on the association between DM and empathy in the medical student population. The fact that previous studies have demonstrated an increase of medical students' empathy as a result of mindfulness training suggests that it might be possible that DM also is related to empathy and may play a pivotal role in fostering this other-oriented attitude in the medical student population. Therefore, studying the association between DM and empathy among medical students is needed to broaden cross-national knowledge of the empirical association between DM and empathy. Moreover, the a priori knowledge on the medical students' DM profile and the relationship with their empathy could be useful for medical administrators and educators to organize and provide tailored mindfulness-based training in order to enhance empathy in medical students.

## **2. Aims and hypotheses**

The aims of this cross-sectional study were: (1) to assess DM facets in a sample of Italian medical students, including gender and year of study differences; and (2) to explore the association between DM and the different dimensions of empathy. In light of the above-mentioned literature, the study hypotheses were: (1) female students would show lower DM than males and older participants would score higher on all or some facets of DM than younger ones; and (2) DM would be positively related to the ability to feel compassion for others and to adopt their perspective, and negatively correlated with the stressful, emotional, interpersonal over-involvement.

## **3. Method**

### ***3.1. Procedure***

Participants were a sample of undergraduate medical students enrolled at one six-year medical school in northern Italy. Four consecutive cohorts of second- and fifth-year medical students were invited. All the students who attended the mandatory courses on communication skills (scheduled in the first semester of the second year of study) and clinical psychology (scheduled in the first semester of the fifth year of study) were approached after class and invited to participate in the study. At the time of data collection, the second-year students had not yet started the clinical internship, whereas their fifth-year colleagues had already completed a three-year period of clinical internship. The university in which the study took place does not yet provide any courses on meditation and/or mindfulness training (as checked from the list of optional activities and the syllabus). No exclusion criteria were applied. Participation was voluntary and anonymous. Students were asked to complete a battery of paper-and-pencil questionnaires and completion of the assessment took about 30 minutes. No class credit or any other kind of compensation was given to students for their participation. All individual participants included in the study signed informed consent before participating in the survey. The present study was approved by the ethical research

committee of the university in which the research was conducted (Protocol no. 39927).

### 3.2. Measures

The survey included a self-report demographic questionnaire to assess sample characteristics, including gender, age, nationality, actual and/or previous meditation practice and the current year of medical degree. DM and empathy were assessed using the Italian versions of two reliable, validated and widely used self-report instruments: the Five-Facet Mindfulness Questionnaire (FFMQ) and the Interpersonal Reactivity Index (IRI). In the present study, both the FFMQ and IRI demonstrated good internal consistency (Table 1).

[Table 1 near here]

The FFMQ<sup>33,51</sup> is a 39-item self-report instrument that assesses DM. Respondents express their accordance with each item on a five-point Likert-type scale (1 = “never or very rarely true”, 5 = “very often or always true”). The five facets of DM evaluated by the questionnaire are: (1) *Observing*: measure of ability to focus on one’s inner feelings and reactions to stimuli; (2) *Describing*: measure of the ability to put into words one’s thoughts and feelings; (3) *Acting with Awareness*: measure of the tendency to make conscious and deliberate actions as opposed to functioning automatically and without thought or reflection; (4) *Nonjudging* of inner experience: measure of the competence to not judge one’s inner state, thoughts and emotions, and to accept them; (5) *Nonreactivity* to inner experience: measure of the ability to process disturbing stimuli without impulsive reactions.

The IRI<sup>52,53</sup> is a 28-item measure that assesses the emotional and cognitive empathy dimensions. Items are rated using a five-point Likert-type scale (0 = “does not describe me well”, 4 = “describes me very well”) and the questionnaire includes four 7-item factors: (1) *Empathic Concern*: measure of the tendency to feel sympathy and concern for the misfortune of others; (2) *Personal Distress*: measure of the tendency to feel personal anxiety and unease in tense

interpersonal settings; (3) *Perspective Taking*: measure of the ability to spontaneously adopt the psychological point of view of others; (4) *Fantasy*: measure of the tendency to transpose oneself imaginatively into the feelings and actions of fictitious characters in books, movies, and plays.

### **3.3. Data analyses**

All data were screened for skewness and kurtosis in order to test assumptions of normality.<sup>54</sup>

Descriptive statistics (means and standard deviations) were computed and Pearson's chi-square test of independence was performed to compare the frequency of males and females in the second- and fifth-year medical student groups. For the first aim, analysis of variance (ANOVA) was used to explore gender (male vs. female students) and age (second-year vs. fifth-year students) differences in terms of DM. Gender comparisons were controlled for year of study, and vice versa. For the second aim, hierarchical multiple regression analysis was implemented to explore the statistical association between DM and empathy measures. In particular, we ran four separate hierarchical multiple regressions for each IRI subscale. We adopted a two-block strategy with "enter" method. Gender and year of study variables were entered as a single block at Step 1 to control the results for the effect of demographic confounding factors. We added the FFMQ facets at Step 2 to test the research hypothesis that their insertion in the regression models would result in a statistically significant improvement in the total explained variance of each IRI dimension. A statistically significant variation in the coefficient of determination ( $\Delta R^2$ ) at Step 2 would mean that entry of the FFMQ facets into the regression model explained the additional variance of the dimension of IRI. Given the exploratory design of the present study, the Bonferroni correction was applied. Consequently, results were considered to be statistically significant at a  $p$  value of  $< .0125$ . Effect size, as partial eta squared ( $\eta_p^2$ ), was computed for ANOVA. All statistics were computed using IBM SPSS 24.0. Protocols that would have returned incomplete were excluded from the analyses.

## 4. Results

### 4.1. Demographic characteristics and descriptive statistics for dispositional mindfulness and empathy

A total of 933 out of 1120 undergraduate medical students decided to participate in the study (response rate = 83.3%). The study sample comprised 509 (54.6%) females and 424 (45.4%) males; 540 (57.9%) students were from the second year of the medical degree and 393 (42.1%) from the fifth year of study. The response rate of the four cohorts of second-year students was 96.4%, whereas the completion rate of the four cohorts of fifth-year students was 70.2%. No participant students returned incomplete protocols. Second- and fifth-year groups did not differ significantly in gender distribution [ $\chi^2(1) = 1.02, p = .312$ ]. The average age of second- and fifth-year students was  $19.83 \pm .32$  and  $23.10 \pm .45$ , respectively. All second-year students were younger than the fifth-year students. All participants were Italian, and none of them had previous experiences with meditation practice.

Table 2 presents descriptive statistics for the FFMQ and IRI subscales. Descriptive analyses were carried out for the whole sample ( $N = 933$ ). Table 1 shows the means and standard deviations (SD) for each of the FFMQ and IRI subscales as a function of gender and year of study.

[Table 2 near here]

### 4.2. First aim: gender and age comparison for dispositional mindfulness

For the overall sample, we found a significant gender effect with regard to the *Describing*, *Acting with Awareness*, and *Nonreactivity* facets of the FFMQ. Specifically, female medical students had higher mean scores than male students for *Acting with Awareness* [ $F(3,929) = 11.896, p = .001, \eta_p^2 = .01$ ]; conversely, males had higher mean scores than females on *Describing* [ $F(3,929) = 6.559, p = .01, \eta_p^2 = .01$ ] and *Nonreactivity* [ $F(3,929) = 60.325, p < .001, \eta_p^2 = .06$ ]. For the overall sample, a main effect of age was found for *Observing* [ $F(3,929) = 13.492, p < .001, \eta_p^2 = .01$ ] and *Nonreactivity* [ $F(3,929) = 9.106, p = .003, \eta_p^2 = .01$ ]. In particular, younger students (second-year

students) showed higher scores of *Observing* and lower scores of *Nonreactivity* than older ones (fifth-year students). No statistically significant interactions between gender and year of study were found on each comparison.

#### **4.3. Second aim: association between dispositional mindfulness and empathy**

The results of hierarchical multiple regression analysis for the IRI subscales are reported in Table 3. The second step of each model contributed significantly to the model's predictive ability. At Step 2, the gender variable showed a significant effect on all IRI dimensions, whereas the year of study variable was significantly but slightly associated with *Perspective Taking* scores. In particular, female students obtained higher scores than male counterparts on all the IRI dimensions, whereas older medical students showed higher levels of *Perspective Taking* than their second-year colleagues, even after the FFMQ facets were entered into the regression model. Entry of the FFMQ facets added from 7–22% of the explained variance in the IRI dimensions. The correlation patterns were heterogeneous and  $\beta$  values were small in most cases. In particular, *Observing* was not statistically associated with *Personal Distress* but was significantly and positively related to *Empathic Concern*, *Perspective Taking* and *Fantasy*. *Describing* was unrelated to *Perspective Taking* but significantly associated with *Empathic Concern*, *Personal Distress*, and *Fantasy*. *Acting with Awareness* and *Nonreactivity* were significantly associated with all the IRI dimensions, whereas *Nonjudging* correlated significantly and negatively only with *Personal Distress*.

[Table 3 near here]

## **5. Discussion**

While many efforts have been made to assess the impact of mindfulness-based interventions on health professionals and students' empathy,<sup>24–26,29</sup> little attention has been paid to the role of DM in non-trained medical students. Given this research gap, we were interested in investigating DM facets in a sample of medical students and exploring if and to what extent DM, before any formal



meditation training, impacts on empathy. To the best of our knowledge, this is the first contribution carried out in the undergraduate medical educational context that has investigated the relationship between DM and empathy in medical students. Results from our study suggest that gender and age differences in terms of DM are heterogenous. Moreover, our findings showed that most DM facets negatively correlated with the difficulties in managing distress and worries in tense interpersonal settings (*Personal Distress*) and were positively related to the ability to spontaneously adopt the others' viewpoints (*Perspective Taking*). Our findings are in line with our theoretical hypothesis, according to which DM allows individuals to reduce the subjective level of emotional distress and to be more focused on others' needs and feelings.<sup>55-57</sup>

### ***5.1. First aim: gender and age were differently associated with dispositional mindfulness***

In the general literature, females are reported to be less mindful than males because of their higher tendency to ruminate and to internalize thoughts.<sup>34,35</sup> Our results showed that male medical students, when compared with their female counterparts, had a higher dispositional ability to name their own emotions and feelings and to process emotional activation without reacting automatically to them. These findings are in line with other previous research, which also involved medical students and found that male students were more able to be aware and nonreact to their mental states.<sup>58</sup> However, there are literature studies that state that women obtain higher scores than males on some facets of DM.<sup>36</sup> For example, Alispahic and Hasanbegovic-Anic<sup>37</sup> have found that women have more ability to observe their thoughts than men. Accordingly, in our study, female students were more able to act with awareness than men. Different emotion regulation strategies,<sup>59</sup> levels of distress<sup>58</sup> and cognitive functioning<sup>37</sup> between males and females have been proposed as an explanation for the mindfulness differences between genders. Given the above, the literature dealing with gender differences on DM is controversial and not conclusive. Our results lead us to think that gender differences in DM facets exist at baseline and should be taken into consideration in order to make tailored interventions focused on specific mindfulness abilities.

Considering the age differences in DM levels, some studies have found a significant positive correlation between DM and age.<sup>36,37</sup> However, in our study, no significant differences in DM scores have been found between younger (second-year) and older (fifth-year) medical students, except for *Observing* and *Nonreactivity*. In particular, older participants had lower scores on *Observing* and higher levels of *Nonreactivity* than younger ones. The lack of an extensive literature background on this topic makes it difficult to discuss these heterogeneous results. The different stage of training of second- and fifth-year students could help us to interpret the age differences we observed in terms of DM facets. We should consider that, at the time of data collection, the second-year students had not yet started the clinical internship, whereas their fifth-year colleagues had already completed a three-year period of internship. We posit that, as clinical internship requires medical students to focus their attention and efforts toward managing the clinical procedures and the patient and relatives' emotional activations, their effort is focused on the external situations, leading them to place less attention on their feelings and emotions. Moreover, during the clinical internship medical students may have "learned" not to observe their inner states, as is often modeled by attendings and residents, who usually promote a bio-medical, disease-centered approach to the medical profession.<sup>6,60,61</sup> Conversely, during the years of clinical internship senior students may have developed, compared to their younger colleagues, a higher capability to detach themselves from their negative thoughts and emotions that often occur in the wards.<sup>62</sup> Lower levels of *Observing* and higher levels of *Nonreactivity* among fifth-year students may be interpreted as a psychological strategy to cope with the stressful experience of pain, suffering, and death in the relationship with patients.

### ***5.2. Second aim: dispositional mindfulness negatively correlated with Personal Distress and positively with Perspective Taking***

From our results on the association between DM facets and empathy dimensions among medical students emerges a quite scattered picture. This finding is in line with previous studies that found

inconsistent and heterogenous correlation patterns between DM and empathy.<sup>43–46,63,64</sup> Although each hierarchical multiple regression model significantly contributed to explain a significant amount of variance in each empathy dimension, DM facets were related to empathy dimensions in a mixed way.

Upon a closer look at each IRI subscale, we could observe that the ability to have a “mindful” asset leads medical students to feel less anxiety and personal distress in demanding interpersonal settings. Consistent with our results, Dekeyser and colleagues<sup>63</sup> have found a negative relationship between several DM facets (awareness, acceptance and describing) and *Personal Distress*. Beitel and colleagues<sup>43</sup> also reported a similar negative correlation between the capability to pay attention and be aware and *Personal Distress*. Our results were also in line with Slonim and colleagues’ findings<sup>58</sup> in a sample of Australian undergraduate medical students: low values on depressive, anxious and stress symptoms were associated with higher self-reported levels on all of the DM facets, except for *Observing*. However, in contrast to our results and the above-mentioned studies, Berry and colleagues<sup>45</sup> found a positive statistical relation between DM scores and *Personal Distress*. Our study did not aim to settle the debate on the cause–effect relationship between DM and *Personal Distress* but contributed to the body of evidence on the beneficial and protective influence of DM on emotional distress in stressful emergency situations.

With regard to *Perspective Taking*, our results are in line with those found in previous studies,<sup>65–67</sup> which highlighted the role of observing and suspending one’s mental states in the cultivation of openness and interest in the other’s experience. Consistent with this, different studies<sup>43,45</sup> showed that paying attention to inner states and acting with awareness were positively associated with *Perspective Taking*. Indeed, the ability of medical students to act with awareness, observe their emotions and nonreact automatically to them could lead to a better ability to take others’ perspective and understand what other people feel. These findings support the theoretical hypothesis that DM contributes to the awareness of others’ needs.

As regards Empathic Concern, this emotional dimension of empathy was differently associated with the FFMQ facets. In particular, *Empathic Concern* was positively related to *Observing*, *Describing* and *Acting with Awareness*. This result is in line with those of Beitel et al.<sup>43</sup> and Berry et al.,<sup>45</sup> which showed that DM facets (acting with awareness and attention) were positively related to *Empathic Concern*. Similar findings were found also in a previous study on married couples, which reported that there were significant correlations between DM facets and the *Empathic Concern* scale of the IRI.<sup>67</sup> Moreover, in our sample, *Empathic Concern* was negatively correlated with *Nonreactivity*. Consistent with this, MacDonald and Price<sup>44</sup> found that affective empathy was negatively correlated with the *Nonreactivity* facet of the FFMQ. As *Empathic Concern* by definition reflects the tendency to feel sympathy and concern for the misfortune of others, medical students who are prone to detach themselves from their negative thoughts and emotions are less inclined to have feelings of concern for others.

Lastly, regarding the *Fantasy* dimension of empathy, we noticed that students who were more able to observe and describe their inner states, but found it difficult to act with awareness and to nonreact automatically to disturbing stimuli, scored higher on *Fantasy*. These findings make sense because this component of the IRI reflects the tendency of respondents to transpose themselves imaginatively into the lives of fictitious characters. People who are prone to live second fictional lives show less ability to respond with awareness to their own external (*Acting with Awareness*) and inner (*Nonreactivity*) situations. However, due to the heterogeneity of these results and the lack of literature, other research is needed to disambiguate these findings and deepen our understanding of the relationship between DM facets and the *Fantasy* dimension of the IRI.

### **5.3. Strengths and limitations**

The primary strength of this study is the adoption of universally validated and reliable measures that have been widely used in the field of medical education research and that may allow cross-national comparisons. Secondly, we enrolled in this study a large sample of undergraduate medical students.

Despite these strengths, this research is limited by the cross-sectional methodology. Given that the study compared participants with different characteristics at one time-point, it is not possible to definitively establish the direction of the link between DM and the other study variables (socio-demographics and empathy). Moreover, this study used exclusively self-reported measurements and the findings of this research are focused on the medical student population, therefore our results should be generalized with caution. In light of these limitations, future research on this topic should: (a) involve other health students and professionals and adopt a longitudinal study design; (b) focus on the effectiveness of modular mindfulness-based training in increasing specific DM facets and empathy dimensions among health students and workers; (c) assess if and to what extent DM influences clinical practice; and (d) use other indices (such as behavioral and physiological) and variables to explore their potential mediation/moderation effects on the association between DM and empathy.

## **6. Conclusions and implications of the present study**

Overall, this study has contributed to the literature on the relationship between DM and empathy. Our findings provide further support for the association between DM facets and both emotional and cognitive empathy dimensions in undergraduate medical students. Despite the heterogeneity of our results and of the literature on the relationship between DM facets and empathy dimensions, we can conclude that medical students who display more and higher DM facets appear to be less emotionally distressed in stressful and emergency interpersonal situations and more able to take others' cognitive perspective.

We posit that integrating medical curricula with tailored protocols that cultivate specific DM facets<sup>68</sup> could act to reduce medical students' emotional distress in demanding interpersonal settings and to sustain their cognitive capability to take others' viewpoints.<sup>69</sup> Moreover, considering that our results on the association between DM and empathy are controlled by gender and age differences, we can also suggest that an educational intervention on DM to foster empathy could be

implemented for all the students enrolled in the medical course.

## 7. References

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