



## Outcomes of MBSR or MBSR-based interventions in health care providers: A systematic review with a focus on empathy and emotional competencies



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### ABSTRACT

**Background:** Emotional competencies are extremely important for healthcare providers exposed to patients' suffering. The effect of mindfulness-based stress reduction (MBSR) has been studied in this population. However, it is unclear whether capacities identified as core for care are modified favourably by this intervention.

**Objectives:** (1) To identify outcomes in studies on the effect of MBSR in healthcare providers. (2) To evaluate the impact of MBSR on these outcomes. (3) To assess current knowledge on whether capacities central to care are positively impacted by MBSR: empathy, identification of one's own emotions, identification of other's emotions and emotional acceptance.

**Methods:** We performed a systematic review on interventional studies published up to 2015 evaluating the effect of MBSR in healthcare professionals. A subset of studies including empathy and emotional competencies was assessed for bias following current methodological standards.

**Results:** Thirty nine studies were identified. 14/39 studies measured empathy or some form of emotional competence in healthcare providers. Evidence regarding the effects of MBSR in professionals suggests this intervention is associated with improvements in burnout, stress, anxiety and depression. Improvements in empathy are also suggested but no clear evidence is currently available on emotional competencies.

**Conclusions:** High quality evidence is available on the effect of MBSR on professionals' mental health. However, while some emotional competencies have been identified as being of major importance for high quality care, they are still scarcely studied. Studying these outcomes is important, as it may help explain how mindfulness contributes to professionals' mental health and thus help develop targeted interventions.

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## 1. Introduction

Emotional exhaustion among healthcare providers (HCPs) is a critical issue worldwide. HCPs' burnout has been linked to poor patient care, relational problems, substance abuse, depression and suicide.<sup>1</sup> In specialties such as hematology-oncology, professionals are confronted daily with emotionally charged situations related to suffering and death.<sup>2</sup> This can result in difficult relationships with patients.

Empathy is an essential component of harmonious relationships between HCPs and patients.<sup>3</sup> Clinical empathy has been linked to more patient enablement, improved patient satisfaction and adherence, and better health outcomes.<sup>4–6</sup> It has been described as an attribute that involves an emotional response to patients' emotions and an understanding of the inner experiences of patients.<sup>3</sup> While empathy allows HCPs to better 'read' patients, this ability is also linked to susceptibility to burnout.<sup>3</sup> According to Decety,<sup>7</sup> empathy is possible when the person experiences an emotional response to the feelings of another person, can make a distinction between self and other and is able to adequately regulate one's emotions. If HCPs have difficulties regulating their emotions, they may become emotionally drained over time.<sup>8,9</sup>

Some emotional competencies are central to empathy, such as identifying one's own emotions, identifying other's emotions and accepting emotions. Identification of emotions refers to the ability to recognize and name emotions.<sup>10</sup> Emotional acceptance is a form of emotion regulation that involves experiencing emotions with a nonjudgmental attitude and without the tendency to avoid them.<sup>11</sup> These competencies could help prevent emotional confusion, and as a result, emotional exhaustion.

Supporting HCPs by improving their emotional competencies has thus become increasingly important. Better emotional competencies have been reported to contribute positively to caregiver-patient's relationships, empathy, communication skills and prevention of burnout.<sup>13–16</sup> Research in neuroscience has shown that emotions are central to judgment and decision making, further emphasizing the importance of emotional competencies and self-awareness in clinical care.<sup>17</sup>

Recently, a wave of therapies has focused on confronting emotions through acceptance and attentional processes.<sup>18</sup> Some of these interventions call for *mindfulness*, which has been defined as

"paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally".<sup>19</sup> Mindfulness encourages an individual to observe all emotions from a detached view, which may result in enhanced levels of acceptance of one's own experiences.

The first mindfulness intervention to be clinically evaluated was the mindfulness-based stress reduction (MBSR).<sup>21</sup> This program comprises 8 weekly 2.5-h sessions and one full-day silent retreat between the 6th and 7th class. The program incorporates various types of meditation techniques and Hatha yoga postures. It has been found to be effective in the management of stress, physical illnesses and psychological difficulties with a range of clinical and non-clinical populations.<sup>22–24</sup>

A review conducted in 2009 concluded that MBSR-based training could be useful in decreasing emotional exhaustion, reducing stress and anxiety, and improving positive affect in HCPs.<sup>25</sup> Another recent review reports that MBSR may help nurses cope with stress.<sup>26</sup> While MBSR appears to have a positive impact on HCPs' stress and burnout, little is known about the processes underlying these improvements. For example, it is still unclear whether MBSR may help modify emotional competencies in HCPs.

Authors have argued that HCPs enhance their mindfulness skills when interacting with patients<sup>12</sup> and that mindfulness facilitates adaptive emotion regulation through awareness of emotion when it occurs.<sup>27</sup> Thus, mindfulness would enable a more accurate identification of one's own emotions, identification of other's emotions and emotional acceptance.

The first objective of this review is to identify outcomes in studies on the effect of MBSR in HCPs. The second objective is to evaluate the impact of MBSR on these outcomes. The third objective is to assess if some of these outcomes reflect empathy and three key emotional competencies: (a) identification of one's own emotions, (b) identification of other's emotions, and (c) emotional acceptance, as these are deemed essential to professional healthcare.

## 2. Methods

### 2.1. Search strategy

We performed a literature search in PubMed, Medline, PsycINFO, EBM Reviews, Web of Science, CINAHL and Embase electronic databases. The search strategy involved two facets:

mindfulness and healthcare personnel (Table S1). We reviewed all literature published up to January 22, 2015, reference lists of included studies, and previous reviews on mindfulness practice for additional References.

## 2.2. Inclusion criteria

We included quantitative studies published in English using MBSR-based interventions with HCPs or healthcare students. All studies had to test the effect of the MBSR-based intervention on HCPs' outcomes.

## 2.3. Study selection

Two reviewers (ML and ER) independently screened titles and abstracts of all references identified through the search strategy for initial selection. Full texts of potentially eligible studies were obtained and two reviewers (ML and ER) verified their eligibility for inclusion. Discrepancies were resolved through a process of discussion and consensus.

## 2.4. Data extraction

Two reviewers (ML and ER) independently extracted the following data from each of the included articles: authors, year, design, population, sample, type of intervention, outcomes measured, instruments used and main findings. Both reviewers independently entered data into a table. The tables were then compared and the information was checked for accuracy. If extracted data were discrepant, the first author returned to the original article to clarify the correct information. We also contacted study authors to obtain relevant missing data.<sup>28–32</sup>

## 2.5. Quality analysis

Among the studies measuring empathy and emotional competencies, we systematically assessed risk of bias using an adaptation of Cochrane Collaboration's tool (Table S3). We rated the following domains: selection, attribution, reporting and other bias. Two reviewers (ML and ER) independently performed the rating of bias. Discrepancies were once again resolved through discussion. We did not assess bias on the whole pool of studies (all outcomes) as a large body of this pool already had been the subject of a recent review.<sup>26</sup>

We conducted this systematic review according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines<sup>33</sup> (checklist available in Table S5). We registered the protocol on Prospero (International prospective register of systematic reviews) on October 22, 2014, number CRD42014014232.

## 3. Results

### 3.1. Study selection

The search process and study selection are presented in a flow chart (Fig. S1). Thirty-nine articles were finally included.<sup>28,29,31,34–69</sup> Among these, 14 measured either empathy or indirectly measured the three key emotional competencies: identification of one's own identification of other's emotions and emotional acceptance (Table 1).

### 3.2. Study characteristics

Most studies (25/39, 64%) were conducted in the US; fourteen (14/39, 36%) studies were randomized controlled trials (RCT), ten (10/39, 26%) studies were quasi-experimental studies with control,

but no random allocation and fifteen (15/39, 38%) studies were pre-post designs with no control. Intervention length ranged from 1 to 12 weeks. Table S2 provides information on each study design, sample, intervention, outcomes, and main findings.

### 3.3. Sample characteristics and demographics

The 39 reviewed studies included 2379 individuals aged 19–60. The vast majority of participants were female (81%). Fourteen studies (48% of the total number of participants) involved students, including premedical and medical students, nursing and psychology students. Ten studies (16% of the total number of participants) included nurses. The sample sizes of the studies reviewed ranged from 12 to 302 participants (median = 41).

### 3.4. Outcomes measured

Thirty-eight different outcomes were measured in the 39 studies (median number of outcomes/studies = 4, min–max = 1–8).

### 3.5. Mental health outcomes

Eleven different mental health outcomes were measured, including burnout, perceived stress, anxiety and depression (Fig. 1). All of the reviewed studies, except two, measured at least one mental health outcome. The most measured outcome in this category was HCPs' perceived stress, appearing in nineteen (19/39, 49%) studies. Eighteen of these (18/19, 95%) found that MBSR decreases HCPs' perceived stress. Burnout was the second most measured outcome, appearing in 17 studies. Nine (9/17, 53%) studies found that MBSR reduces HCPs' burnout. Ten (10/11, 91%) studies concluded MBSR to be effective in reducing anxiety in HCPs. Six (6/6, 100%) studies found MBSR to be effective in improving HCPs' mental well-being. Overall, these results suggest that MBSR may impact HCPs' mental health difficulties favorably.

### 3.6. Physical health and physical well-being

Four (4/39, 11%) studies measured the effect of MBSR on HCPs' physical well-being. One (1/4, 25%) study found MBSR to be useful in increasing HCPs' physical well-being.

### 3.7. Mindfulness outcomes

Only seventeen studies in the review measured the construct of mindfulness. Five different questionnaires were used. Fourteen (14/17, 82%) studies assessing mindfulness in HCPs, found that MBSR increased HCPs' levels of mindfulness. Ten (10/17, 59%) studies used the Mindfulness Attention Awareness Scale (MAAS),<sup>70</sup> which measures dispositional attention and awareness of present moment experiences with a single total score. Four studies used the Five Facets Mindfulness Questionnaire (FFMQ),<sup>71</sup> which measures five domains of mindfulness (observing, describing, acting with awareness, non-judging and non-reactivity). Two studies used the Toronto Mindfulness Scale (TMS),<sup>72</sup> which comprises two factors: Curiosity and Decentering. One study used the Freiberg Mindfulness Inventory (FMI),<sup>73</sup> which measures a global mindfulness score. One study used the Kentucky Inventory of Mindfulness Skills (KIMS),<sup>74</sup> which consists of four factors (observing the self in the moment, describing without reacting, acting with self-awareness, and accepting the present moment without judgment). Finally, one study used a 2-factor Mindfulness Scale, which measures the facets 'observing' and 'non-reactivity' of the FFMQ.<sup>71</sup>

**Table 1**  
Summary table of reviewed articles measuring empathy or emotional competencies in MBSR interventions with health care providers (N = 14, 1998–2014).

Study	Design	Population	Sample	Intervention	Concept studied	Measures	Effects
Amutio et al. <sup>34</sup>	RCT	Physicians	42 Intervention: 21 Control: 21	Standard 8-week MBSR	Emotional acceptance Identification of one's own emotions	-FFMQ 'non-judging' -FFMQ 'non-reactivity' -FFMQ 'observing' -FFMQ 'describing'	-Increased 'non-judging ' -Increased 'non-reactivity' -Increased 'observing' -Increased 'describing'
Hallman et al. <sup>37</sup>	Pre-post (no control)	Psychiatric unit staff	12	8-day mindfulness intervention based on MBSR	Emotional acceptance	-TMS 'decentering'	-Increased TMS total score
Manotas et al. <sup>39</sup>	RCT	Health care professionals	131 83 (final) Intervention: 40 Control: 43	4-week adaptation of MBSR	Emotional acceptance Identification of one's own emotions	-FFMQ 'non-judging' -FFMQ 'non-reactivity' -FFMQ 'observing' -FFMQ 'describing'	-Increased 'non-judging ' -No change in 'non-reactivity' -Increased 'observing' -No change in 'describing'
Martin-Asuero et al. <sup>40</sup>	RCT	Primary health care professionals	68 Intervention: 43 Control: 25	8-week Mindfulness Education Program based on MBSR	Empathy Emotional acceptance Identification of one's own emotions	-JSPE (total score) -JSPE 'perspective taking' -JSPE 'compassionate care" -JSPE 'standing in the patient shoes' -FFMQ 'non-judging' -FFMQ 'non-reactivity' -FFMQ 'observing' -FFMQ 'describing'	-Increased total empathy -No change in 'perspective taking' -No change in 'compassionate care" -Increased 'standing in the patient shoes' -No change in 'non-judging' -Increased 'non-reactivity' -No change in 'observing' -No change in 'describing'
Barbosa et al. <sup>42</sup>	Quasi- experimental	Graduate healthcare students	31 28 (final) Intervention 13 Control: 15	Standard 8-week MBSR	Empathy	-JSPE (total score)	-Increased total empathy
Bazarco et al. <sup>43</sup>	Pre-post (no control)	Nurses	41 36 (final)	8-week group telephonic sessions (tMBSR) based on MBSR	Empathy	-JSPE (total score)	-Increased total empathy
de Vibe et al. <sup>44</sup>	RCT	Medical and psychology students	293 288 (final) Intervention 144 Control: 144	7-week program based on MBSR	Emotional acceptance Identification of one's own emotions	-FFMQ 'non-judging' -FFMQ 'non-reactivity' -FFMQ 'observing' -FFMQ 'describing'	-Increased 'non judging' in women -Increased 'non-reacting' in women -No change in 'observing' -No change in 'describing'

Brady et al. <sup>49</sup>	Pre-post (no control)	Behavioral health staff	23 16 (final)	4-week program based on MBSR	Emotional acceptance	-TMS 'decentering'	-Increased TMS total score
Gokhan et al. <sup>54</sup>	Quasi-experimental	Psychology students	42 Intervention: 22 Control: 20	12-week experiential training module based on MBSR	Emotional acceptance Identification of one's own emotions	-FMI (items) -KIMS 'accept without judgment' -KIMS 'observing' -KIMS 'describing'	-Increased scores on FMI -Increased KIMS 'accept without judgment' -Increased 'observing' -No change in 'describing'
Cohen and Miller <sup>55</sup>	Pre-post (no control)	Graduate psychology students	28 21 (final)	6-week interpersonal mindfulness training (IMT) based on MBSR	Identification of one's own emotions Identification of other's emotions	-SREIT (items) -SREIT (items)	-Increased total score on SREIT -Increased total score on SREIT
Krasner et al. <sup>57</sup>	Pre-post (no control)	Primary care physicians	70	8-week Mindful communication based on MBSR	Empathy	-JSPE (total score) -JSPE 'perspective taking' -JSPE 'compassionate care' -JSPE 'standing in the patient shoes'	-Increased total empathy -Increased 'perspective taking' -No change in 'compassionate care' -Increased 'standing in the patient shoes'
Galantino et al. <sup>66</sup>	Pre-post (no control)	Healthcare professionals (employees in administrative and direct patient care)	84 64 (final) 42 (cortisol)	8-week MM program (cognitive-behavioral stress management program based on MBSR)	Empathy	-IRI 'emotional concern' -IRI 'fantasy' -IRI 'personal distress' -IRI 'perspective taking'	-No change in 'emotional concern' -No change in 'fantasy' -No change in 'personal distress' -No change in 'perspective taking'
Beddoe and Murphy <sup>68</sup>	Pre-post (no control)	Nursing students	23 18 (final)	Standard 8-week MBSR	Empathy	-IRI 'emotional concern' -IRI 'fantasy' -IRI 'personal distress' -IRI 'perspective taking'	-No change in 'emotional concern' -No change in 'fantasy' -No change in 'personal distress' -No change in 'perspective taking'
Shapiro et al. <sup>69</sup>	RCT	Premedical and medical students	78 73 (final)	7-week intervention based on MBSR	Empathy	-ECRS	-Increased empathy

ECRS—Empathy Construct Rating Scale (adapted version, 42-item); FFMQ—Five Facets Mindfulness Questionnaire; FMI—Freiburg Mindfulness Inventory; IRI—Interpersonal Reactivity Index; JSPE—Jefferson Scale of Physician Empathy; KIMS—Kentucky Inventory of Mindfulness Scale; RCT—Randomized Controlled Trial; SREIT—Schutte Emotional Intelligence Scale; TMS—Toronto Mindfulness Scale.

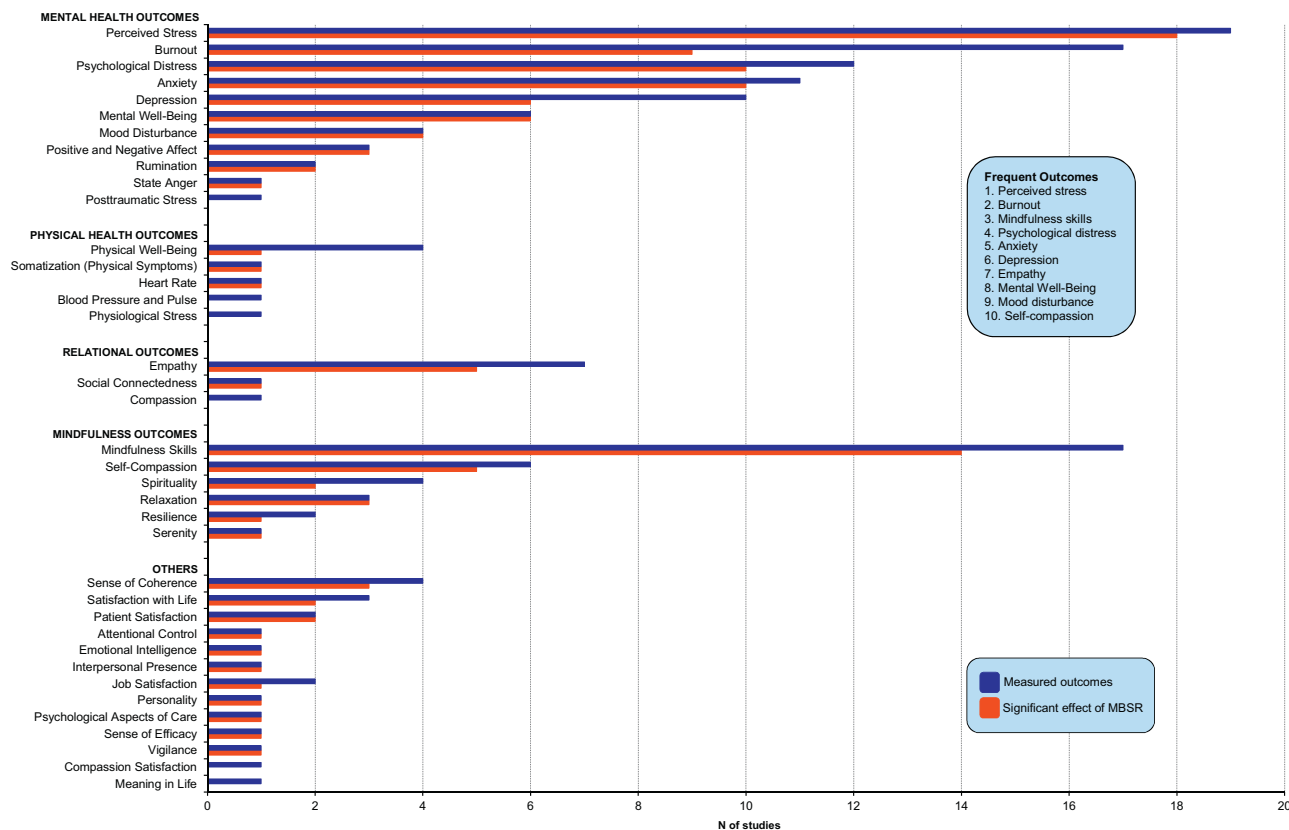


Fig. 1. Frequency of outcomes included in 39 studies reporting effects of MBSR in health care providers.

### 3.8. Other outcomes

Four (4/17, 24%) studies measured the sense of coherence, all of them using the SOC–Orientation to Life Questionnaire.<sup>75</sup> This measure comprises three subscales corresponding to factors a sense of empowerment and self-efficacy (sense of comprehensibility, sense of manageability and meaningfulness). Three (3/4, 75%) studies found that MBSR improves HCPs’ sense of coherence.

### 3.9. Quality assessment of studies measuring empathy or emotional competencies

We identified 14 studies for which a systematic quality assessment could be performed. The inter-rater agreement between the reviewers for the quality assessment was excellent (kappa = .83). Nine (9/14, 64%) studies showed low risk of bias (Table S4). The most significant contributor to risk of bias was the use of a convenience sample. Another area that presented high risk of bias was the study design (only seven [7/14, 50%] studies used a control group). Incomplete outcome data was another bias. In many cases the dropout rates were large, ranging from 11 to 37% (median = 25). Only two (2/14, 14%) studies managed missing data for analyses. Only 4 studies (29%) mentioned whether participants had received previous mindfulness training and only seven (7/14, 50%) studies mentioned the instructor training.

#### 3.9.1. Empathy

Seven studies specifically measured empathy in HCPs. Five (5/7, 71%) studies found that MBSR improves HCPs empathy. All measures were self-descriptions of empathy. The Jefferson Scale of Physician Empathy (JSPE)<sup>76</sup> was used in 4 studies. The JSPE is a self-administered questionnaire, which assess empathy specifically in physicians. The scale contains three components: perspective

taking, compassionate care and standing in the patient’s shoes. In the present pool, four studies using this measure found MBSR to be associated with a significant increase in empathy total score in HCPs.<sup>40,42,43,57</sup> Three of these studies showed low risk of bias in our quality assessment,<sup>40,42,57</sup> and one showed high risk of bias.<sup>43</sup> One RCT showing low risk of bias found an improvement in the ‘standing in the patient shoes’ subscale<sup>40</sup> and a pre-post design study also showing low risk of bias found an improvement in the ‘perspective taking’ and the ‘compassionate care’ subscales.<sup>57</sup> One RCT with low risk of bias used an adapted version of the Empathy Construct Rating Scale (ECRS),<sup>77</sup> which measures an overall level of empathy. The RCT found that MBSR improves scores on overall empathy levels in medical and premedical students.<sup>69</sup>

#### 3.9.2. Identification of one’s own emotions

Two scales of the KIMS were related to the identification of one’s own emotions: the ‘observing’ scale and the ‘describing’ scale. A quasi-experimental study using the KIMS, found that MBSR improved HCPs’ scores on the ‘observing’ scale.<sup>54</sup> The ‘observing’ scale and the ‘describing’ scale of the FFMQ also contain items related to identification of one’s own emotions (Table 2). Two RCTs, both showing low risk of bias, found that MBSR improves the FFMQ ‘observing’ scale score in HCPs.<sup>34,39</sup> One of these RCTs also found an improvement in the ‘describing scale’.<sup>34</sup> One pre-post design study in the review measured emotional intelligence using the Self-Report of Emotional Intelligence (SREIT),<sup>78</sup> a one-factor self-report measure of emotional intelligence. The questionnaire does not specifically measure the identification of one’s own emotions, but some of the items are related to that construct. The study found that MBSR increases the overall emotional intelligence of graduate psychology students.<sup>39</sup> However, this study showed high risk of bias in our quality assessment.

**Table 2**  
Items related to emotional competencies in studies reviewed.

Emotional competencies	Measured used
Identification of one's own emotions	KIMS 'observing' scale <ul style="list-style-type: none"> <li>- "I notice changes in my body, such as whether my breathing slows down or speeds up"</li> <li>- "I intentionally stay aware of my feelings"</li> <li>- "I notice when my moods begin to change"</li> </ul>
	KIMS 'describing' scale <ul style="list-style-type: none"> <li>- "I'm good at finding the words to describe my feelings"</li> <li>- "I have trouble thinking of the right words to express how I feel about things"</li> <li>- "Even when I'm feeling terribly upset, I can find a way to put it into words"</li> </ul>
	FFMQ 'observing' scale <ul style="list-style-type: none"> <li>- "I notice how foods and drinks affect my thoughts, bodily sensations, and emotions"</li> <li>- "I pay attention to how my emotions affect my thoughts and behavior"</li> <li>- FFMQ 'describing' scale</li> <li>- "I'm good at finding words to describe my feelings"</li> <li>- "Even when I'm feeling terribly upset, I can find a way to put it into words"</li> <li>- "I can usually describe how I feel at the moment in considerable detail"</li> </ul>
	SREIT items <ul style="list-style-type: none"> <li>- "I am aware of my emotions as I experience them"</li> <li>- "I easily recognize my emotions as I experience them"</li> </ul>
Identification of other's emotions	SREIT items <ul style="list-style-type: none"> <li>- "By looking at their facial expressions, I recognize the emotions people are experiencing"</li> <li>- "When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself"</li> <li>- "I know what other people are feeling just by looking at them"</li> <li>- "I can tell how people are feeling by listening to the tone of their voice"</li> </ul>
	FFMQ 'non-judging' scale <ul style="list-style-type: none"> <li>- "I criticize myself for having irrational or inappropriate emotions"</li> <li>- "I tell myself I shouldn't be feeling the way I'm feeling"</li> <li>- "I think some of my emotions are bad or inappropriate and I shouldn't feel them"</li> </ul> FFMQ 'non-reactivity' scale <ul style="list-style-type: none"> <li>- "I perceive my feelings and emotions without having to react to them"</li> <li>- "In difficult situations, I can pause without immediately reacting"</li> </ul>
Emotional acceptance	KIMS 'accept without judgment' scale <ul style="list-style-type: none"> <li>- "I criticize myself for having irrational or inappropriate emotions"</li> <li>- "I tell myself that I shouldn't be feeling the way I'm feeling"</li> <li>- "I think some of my emotions are bad or inappropriate and I shouldn't feel them"</li> </ul>
	FMI items <ul style="list-style-type: none"> <li>- "I accept unpleasant experiences"</li> <li>- "In difficult situations, I can pause without immediately reacting"</li> </ul>
	TMS 'decentering' scale items <ul style="list-style-type: none"> <li>- "I was receptive to observing unpleasant thoughts and feelings without interfering with them"</li> <li>- "I approached each experience by trying to accept it, no matter whether it was pleasant or unpleasant"</li> </ul>

FFMQ—Five Facets Mindfulness Questionnaire; FMI—Freiburg Mindfulness Inventory; KIMS—Kentucky Inventory of Mindfulness Scale; RCT—Randomized Controlled Trial; TMS—Toronto Mindfulness Scale; SREIT—Schutte Emotional Intelligence Scale.

### 3.9.3. Identification of other's emotions

None of the studies in the review specifically measured the identification of other's emotions. However, some items of the SREIT<sup>78</sup> are related to this concept (Table 2). A pre-post study found that MBSR increases the overall SREIT score of graduate psychology students,<sup>55</sup> but this study showed high risk of bias.

### 3.9.4. Emotional acceptance

None of the questionnaires used in the reviewed articles specifically measured the construct of emotional acceptance. However,

we identified items or subscales of the questionnaires which were related to this construct (see face validity analysis in Table 2). The FFMQ 'non-judging' and 'non-reactivity' subscales contain items related to emotional acceptance. Four RCTs using the FFMQ found that MBSR interventions with HCPs improves scores on the FFMQ 'non-reactivity'<sup>34,40,44</sup> and 'non judging'<sup>34,39,44</sup> subscales. All of these studies presented low risk of bias according to our quality assessment. The 'accept without judgment' scale of the KIMS<sup>74</sup> is also acceptance-related. A pre-post intervention study with low risk of bias found that MBSR increases scores on the 'accept with-

out judgment' scale.<sup>54</sup> Two items of the FMI may also be seen as acceptance-related (Table 2). A pre-post design study with low risk of bias found that MBSR increases scores on the overall FMI.<sup>54</sup> However, it is unclear how these two items may have influenced the whole FMI scale comprising 14 items. Finally, two items of the 'decentering subscale' of the TMS may be seen as emotion acceptance-related (Table 2). A pre-post study with low risk of bias found that MBSR increases the scores on the TMS<sup>37</sup> in HCPs. However, it is unclear how the two items related to emotional acceptance might have influenced the whole TMS scale comprising 13 items. Another pre-post intervention study found that MBSR increases the scores on the TMS,<sup>49</sup> but this study showed high risk of bias.

#### 4. Discussion

In this review, we identified the range of outcomes used in MBSR interventions with HCPs. Empathy and the three key emotional competencies: identification of one's own emotions, identification of other's emotions, and emotional acceptance were reflected in some of these outcomes.

Mental health outcomes were the most frequently measured. The results confirm that MBSR is associated with favorable effects on HCPs' mental health and levels of mindfulness.

Empathy was measured in only seven (7/39, 18%) studies even though it is central to healthcare. Results are encouraging as a majority of these studies found MBSR to be effective in improving HCPs' level of empathy. Most of these studies were assessed with low risks of bias. However, it is unclear which aspects of empathy (affective or cognitive) were improved by MBSR. Only two (2/39, 5%) studies reported the results of the JSPE subscales.<sup>40,57</sup> Both studies found an increase in "standing in the patient's shoes" which suggests that MBSR might be particularly effective in improving the cognitive facet of empathy.

While some questionnaires contained items related to the identification of one's own emotions, none of them explicitly measured this competence. This is an important gap in the literature because this core emotional competence lies at the basis of more complex skills such as emotion regulation.<sup>10</sup> Mindfulness may facilitate the awareness of emotions as they arise, which may lead to a more accurate identification of one's own emotions. Results from this review suggest that subscales containing items associated with identification of one's own emotions are positively impacted by MBSR. Yet, given the fact that item-level analysis is not available, and that the weight of specific items on scores and subscores is unknown, no clear conclusion can be drawn from these data.

The identification of other's emotions has not been specifically measured in the reviewed studies, even though this is also a central competence for HCPs. When caring for patients, it is essential that HCPs identify whether emotions come from them or from the patient. If they are not aware that the emotion comes from the patient, they could automatically experience emotional contagion (i.e., fully experience the patient's emotions), a phenomenon described by Decety.<sup>7</sup> Emotional contagion has been associated with self-protective behaviors aiming at reducing personal distress (e.g., avoiding) rather than helping behaviors directed toward the other person.<sup>7</sup> Results from the present review are inconclusive as we cannot be sure how a few items related to this construct may have influenced a measure comprising several items. Moreover, only one study used a questionnaire containing items related to this construct, and that study showed high risk of bias.<sup>55</sup>

Emotional acceptance was indirectly measured by some of the subscales or items of the questionnaires used in the reviewed studies. HCPs in distress are likely to have difficulty accepting their emotions if they lack specific skills, such as detecting and naming

their emotions. Mindfulness instructs one to approach emotions with curiosity and acceptance, without judgment or attempts to change the experience.<sup>20</sup> Indeed, the results obtained in this review suggest that MBSR could improve emotional acceptance in HCPs. As expected, no published evidence supports the observation that MBSR could decrease emotional acceptance. Again, no clear conclusion can be drawn from these data, because the weight of individual items related to emotional acceptance on the subscales is unknown.

##### 4.1. Limitations of studies measuring empathy or emotional competencies

A few quality issues were identified in the pool of studies examined for risk of bias. Many of the studies had limited sample sizes, making the identification of small-size changes difficult and limiting external validity. There were also many variations of MBSR in the reviewed studies. The length of programs and classes varied considerably and it is not clear whether abbreviated versions are as effective as the standard MBSR. Moreover, 60% of the total number of participants was still in training, which makes it difficult to generalize the findings to practicing professionals. Previous research has suggested that the effects of MBSR interventions may potentially vary when applied to students versus healthcare professionals,<sup>26</sup> probably because school-related stress may differ from healthcare stress. Importantly, only a minority of studies addressed teachers' training, even though the teacher skills are essential to guarantee a certain level of standardization between studies.<sup>79</sup> Finally, it is difficult to attribute the effect of MBSR on HCPs outcomes to mindfulness per se, as no study examined the mediation effect of mindfulness on those outcomes.

##### 4.2. Limitations of the present study

We must acknowledge some limitations of the present review. First, we did not conduct a meta-analysis due to the wide variety of outcomes measured and the paucity of results on empathy and emotional competencies. Second, we could not draw definite conclusions concerning emotional competencies because the measures of these constructs were not isolated, but rather included in scales and often mixed with other concepts.

However, we found some robust evidence suggesting that MBSR should increase empathy. The current literature does not explicitly study the following competencies: identification of one's own emotions, identification of other's emotions and emotional acceptance. However, the idea that these competencies are favorably influenced by mindfulness practice appears stronger after this review, given the fact that no counterintuitive results were found when considering related outcomes.

##### 4.3. Future directions

Future research in the field could benefit from guidelines developed to improve the protocols of interventions, such as the CONSORT guidelines,<sup>80</sup> which includes an extension especially for social and psychological interventions.<sup>81</sup> Although we are aware that research on the effect of MBSR on emotional competencies is still in its infancy, our systematic assessment of study bias suggested that methodological improvements could be made regarding (1) the inclusion of participants needing the intervention and without previous experience (2) sufficient sample size to power hypothesis testing and (3) the standardization of the intervention, involving duly trained teachers.

Future studies should distinctly measure cognitive as well as affective aspects of empathy. They should also include validated questionnaires specifically assessing the effect of MBSR on HCPs emotional competencies.<sup>10,82</sup> For example, in addition to mind-



fulness questionnaires, studies on HCPs should include measures on identification of emotions in oneself and others as well as on emotional acceptance<sup>83</sup> as those may be important mediators of the effects of mindfulness on mental health outcomes. There is also a lack of data for severely stressed practicing HCPs (e.g., hematology-oncology) and more studies are needed to evaluate the effectiveness of the program in these populations. As previous studies on the impact of MBSR on HCPs have only evaluated self-reported empathy, future studies should also examine patient's perception of HCPs' empathy and patient's clinical outcomes.<sup>84</sup> Future studies could also include the variable of socioeconomic deprivation, as HCPs working with underserved population may experience more stress.<sup>5</sup> Mindfulness-based interventions for HCPs working with such population could help them cope with their difficult emotions.

Future studies could also examine the effectiveness of shortened versions of MBSR compared to the standard 8-week program. Based on the findings of the present review and with these methodological improvements, future research on emotional competencies in HCPs could add substantial knowledge related to processes and outcomes of MBSR in this population.

### Conflict of interest

None declared.

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### Ethical approval

Not applicable.

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### Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.ctim.2015.11.001>.

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