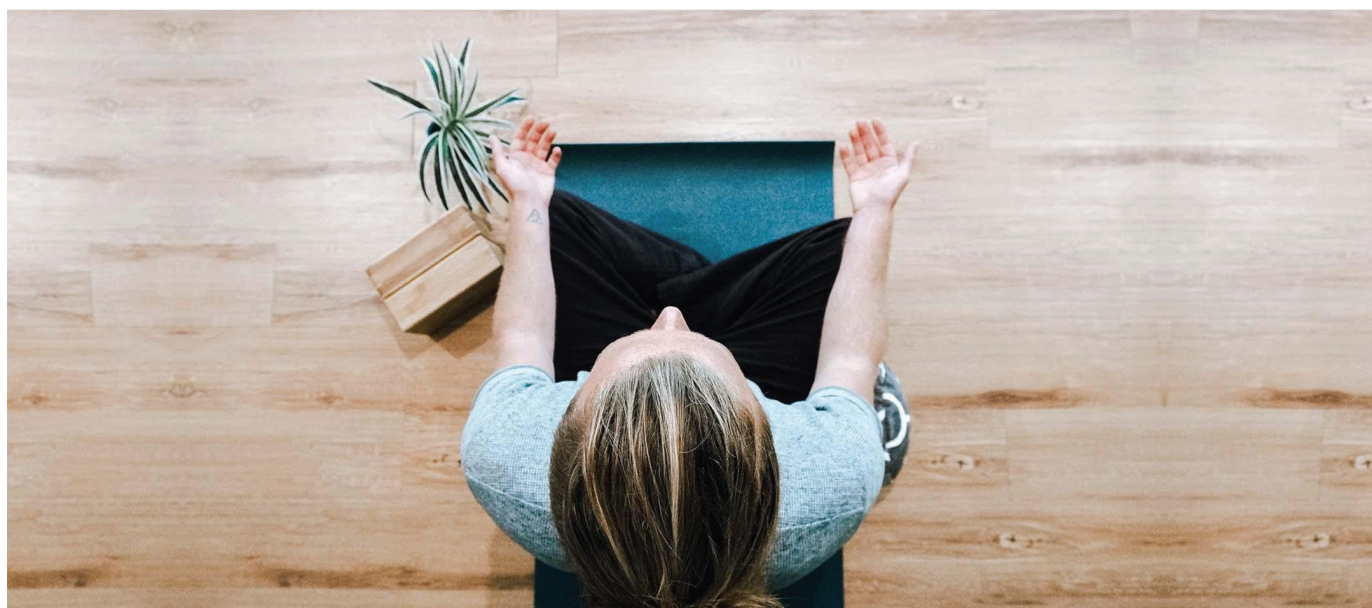


## Should mindfulness-based stress reduction programmes be implemented in medical schools to foster student wellbeing?

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### Abstract

Medical students (MS) are at a higher risk of mental illness due to the demands of their course and future profession. Mindfulness-based stress reduction (MBSR) programmes utilise mental and physical techniques to achieve self-awareness and acceptance. The evidence base for MBSR in MS is limited, however, the studies to date still shed light on the need and potential for interventions that improve mental health in MS. MBSR has a positive effect on stress, anxiety and burnout in MS but shows mixed results for empathy and depression. MBSR must be modified to suit MS' needs and can be implemented within existing elective modules to achieve satisfactory engagement. Future research should focus on MBSR in males, negative MBSR outcomes and the transferability of these skills to enhance patient care.

### Abbreviations

MBSR - Mindfulness-based stress reduction  
MS - Medical Students

### Introduction

The pursuit of a medical career appears to come at a cost.<sup>1</sup> Medical students (MS) are at higher risk of suicide ideation, mental illness,<sup>2</sup> burnout,<sup>3</sup> and lower quality of life.<sup>4,5</sup> This population is faced with a myriad of stressors, for example, psychosocial factors, academic, and clinical factors, such as exposure to human suffering, and death.<sup>2,4,5</sup>

During the COVID-19 pandemic, MS have proven to be more susceptible to mental illness than their age-matched population.<sup>5,6</sup> Recent studies found a 61% and 70% increase in anxiety and depression respectively,<sup>5</sup> as well as an increase in emotional exhaustion, a contributing factor to burnout.<sup>6</sup> These factors arise in medical school but persist throughout their medical careers, continuing to have deleterious effects on future doctors and patient care.<sup>3,7-10</sup>

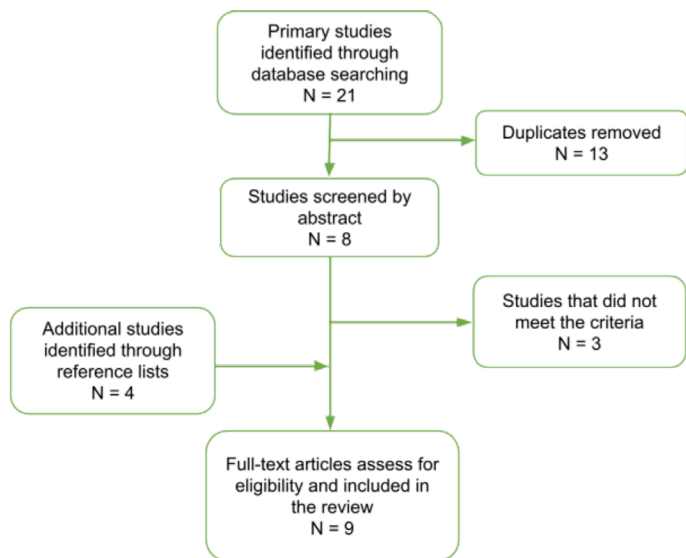
Mindfulness, defined as 'the intentional self-regulation of attention from moment-to-moment,<sup>11</sup> aims to bring about non-judgmental awareness and acceptance.<sup>8</sup> Mindfulness practice has been proposed to reduce stress and burnout in healthcare professionals,<sup>12</sup> prevent ethical erosion (a phenomenon whereby sensitivity and ethical awareness diminishes due to the negative effects of healthcare training and practice),<sup>13</sup> and aid coping with the demands of personal and professional life.<sup>14</sup> Mindfulness-based stress reduction (MBSR) programmes have been investigated in clinical,<sup>11</sup> and non-clinical populations, including in MS.<sup>1</sup> Interestingly, MBSR has also been linked to changes in the brain that are responsible for emotion regulation and self-referential processing.<sup>15</sup> These are principles that may support the development of students into balanced professionals.

This review aims to explore MBSR-like programmes in MS and the impact these have on MS mental wellbeing or the quality of care that MS deliver. Furthermore, the feasibility of including such programmes in current medical curricula will be discussed. This will be achieved by reviewing the existing evidence of MBSR outcomes in

MS. Some studies have modified the traditional MBSR programme to better suit MS.<sup>1</sup> The second part of the review will explore how these modifications enhance the viability of MBSR in the medical curricula. These findings may aid in the development of a mindfulness intervention tailored specifically for MS to foster their wellbeing.

## Methods

A literature search in PubMed, PsycINFO, Embase, and MEDLINE was conducted to identify studies that describe the use of MBSR for mental wellbeing in MS. The selection process is shown in **Figure 1**.



**Figure 1. PRISMA flow diagram detailing number of articles in initial search, abstracts screened and full-text articles included.**

The search strategy was based on keywords: Medical student, Stress, burnout, anxiety, “mindfulness-based stress reduction” and “mindfulness-based interventions”. Moreover, variations in search terms, truncation, and Boolean operators were implemented to ensure that the necessary literature was located.

Studies had to meet the inclusion criteria detailed in **Table 1**. Articles that did not include MS or describe the intervention as MBSR or modified MBSR were excluded from this review. According to the founder of the MBSR programme, Kabat-Zinn, the group discussion is a core component.<sup>11,16</sup> This key feature is implemented to foster mindful communication and aids in initial reflective processes.<sup>16</sup>

**Table 1. Inclusion criteria for review.**

Criteria	Description
Core components of MBSR <sup>11</sup>	<ol style="list-style-type: none"> <li>Didactic teaching for stress management</li> <li>Physical and mental exercise to increase mindfulness and promote moment-to-moment awareness</li> <li>A group component for reflection</li> </ol>
Outcomes (at least one)	Depression, anxiety, burnout or satisfaction
Published	In English with full text available

## Discussion

### MBSR outcomes in MS

**Stress** Stress is often considered an ‘occupational hazard’ in the

medical profession and is an important focus for this topic<sup>12</sup> Awareness allows the individual to observe stress in a non-judgmental manner, reducing its effects.<sup>8,11</sup> This is evident in many studies reporting reduced psychological distress, perceived distress,<sup>10,13,14,17–19</sup> and somatisation.<sup>13</sup> However, follow-up times and sample sizes are often inadequate to deduce the longevity of this outcome.<sup>10,13,17–19</sup>

It must be noted that these improvements occurred in individuals who were not screened for evidence of clinical pathology and so may not provide evidence for students experiencing clinical symptoms, which may sometimes be the case, especially during exam periods. No confirmed physical or mental health test was given to the participants in these studies,<sup>14</sup> yet they were described as being in “good health”.<sup>13,14</sup> Most studies to date rely on volunteers so any significant reduction in stress in the MBSR group must be taken with caution as students with higher distress may have been more inclined to opt for the MBSR, thus introducing bias.<sup>13</sup> For this reason, it is recommended that future studies administer a mental health test (e.g. a mental health screening questionnaire) before commencing the intervention to strengthen the validity of findings. Nevertheless, these combined findings are still important as they may influence students’ coping ability with patient-care-related work stress.<sup>14</sup>

**Anxiety** In a study analysing mood disturbances in the face of exams, self-reported anxiety levels remained stable in students partaking in MBSR, whereas the control group reported a significant increase in anxiety.<sup>13</sup> These findings are supported by a pioneering study in which students partaking in MBSR demonstrated less anxiety in both the state (reaction to an event) and trait (personality feature) domains.<sup>10</sup> Additionally, a reduction in trait anxiety had a positive effect on state anxiety and depression,<sup>10</sup> which further supports MBSR’s potential to foster self-awareness in individuals and reduce the impact of stressors within their personal and professional lives on their work.<sup>13,14</sup>

**Depression** Anxiety and depression were coupled in some studies.<sup>13,18</sup> Of the 5 studies reporting depression, three studies stated significant reductions with the use of MBSR.<sup>10,20,21</sup> Van Dijk *et al.*<sup>14</sup> reported significant improvements in mental state (anxiety and depression) with MBSR and a much larger effect size compared with the active control, somatic relaxation. Furthermore, they found increased empathy followed a reduction in anxiety and depression measures.<sup>10</sup> With a proposed prevalence of 40% of MS suffering from depression<sup>22</sup> or at increased risk of depression,<sup>2,5,12</sup> there should be more studies primarily measuring the effect of MBSR on depression.

**Burnout prevention** Burnout was not a common outcome measure used to assess the efficacy of MBSR. One study, conducted between 1996 and 2000, reported no significant difference in burnout rates between students approaching examinations who undertook a 10-week course of MBSR (n=140) and those approaching exams in the control group. However a significant increase in burnout was reported in the control group (n=162) from baseline, implying the MBSR group was more stable.<sup>13</sup> Furthermore, 58 4<sup>th</sup>-year students self-reported that emotional exhaustion (defined as a feeling of fatigue in the morning at the thought of going into school) had improved as a result of MBSR.<sup>21</sup> However, these conclusions are based upon the results of a self-reported questionnaire, thus decreasing the confidence in this result. It is hypothesised that compassion may relieve emotional tension, becoming a remedy for burnout.<sup>8</sup> However, contrasting findings were seen in other studies.<sup>13,19</sup> De vibe *et al.* concluded that the addition of MBSR did significantly reduce student burnout rates, despite identifying a non-significant reduction in burnout rates in female students.<sup>19</sup>

**Improved quality of care** A lack of self-awareness or compassion fatigue due to poor mental health can undermine humanistic care, reducing the quality of patient care.<sup>3,8,10,14</sup> A randomised trial found no difference in self-reported empathy in clinical settings following MBSR.<sup>14</sup> However, in a pilot study, 69% of students partaking in MBSR reported a positive change in their ability to deal with patient

suffering and be mindful in clinical interactions.<sup>18</sup> This difference may be due to MBSR improving factors other than empathy, such as communicative skills, that affect clinical performance,<sup>8,10,12,21</sup> or may reflect elimination of confounding variables in the randomised study. Unfortunately, studies investigating the potential for positive mindfulness skills to translate to improved quality of care remain scarce.<sup>12</sup>

### Feasibility of MBSR in medical curricula

**Acceptance** A systemic problem in medical education is the lack of time for self-care.<sup>23</sup> Adherence to class attendance and home practise in MBSR was associated with decreased mental distress in several studies.<sup>10,19</sup> About 71% of students were willing to participate in an 8-week MBSR program in one study and 98% stated they would recommend the MBSR course to others.<sup>13,14</sup> Despite these perceived benefits, and reduced session times, students still dropped out due to “academic demands”; one study had a 20% drop-out rate.<sup>13,14,17,20</sup> Adherence to the recommended home practice was particularly low,<sup>17,18</sup> with one study finding that only 13% of students adhered.<sup>18</sup> Therefore, the existing demands of medical school must be considered in the development of an MS-specific MBSR.<sup>17</sup>

Female volunteers were dominant in most studies (53-76%).<sup>10,14,19</sup> One study observed significant improvements in mental distress and wellbeing in females only with an MBSR intervention, though males accounted for less than a quarter of the sample population (24%).<sup>19</sup> A possible explanation for sex differences may be that women report higher depression and burnout than men.<sup>2,9</sup> Alternatively, MBSR may help females handle their stress more than males, with males requiring a different or more extensive intervention.<sup>19</sup> This highlights the need for more evidence for MBSR in male MS.

**Customised MBSR** All studies included in this review described modified MBSR interventions, adapted to better suit MS.<sup>14,17,19,23</sup> Modification was necessary as longer format MBSR programs contributed to increased workload and stress causing reduced wellbeing and engagement, thus being counterproductive.<sup>23,24</sup> A review of 30 studies found no significant association between MBSR class hours and psychological distress variables, such as anxiety and depression;<sup>24</sup> however, research into class hours and the longevity of the outcomes is scarce. Understanding of the mechanisms through which MBSR brings about beneficial effects, as well as the duration of practice required to elicit beneficial outcomes remains unclear.<sup>10,24</sup> These uncertainties must be explored with long-term studies that assess proposed mechanisms such as rumination and self-compassion.<sup>10,24</sup>

The training required to facilitate MBSR is an intensive course taken over years, with a dedication to personal practice.<sup>12</sup> Expertise of the instructor may be a necessary requirement for optimal results from a shortened programme;<sup>24</sup> although not adequately described in most studies, this was probably not the case.<sup>18,24</sup> Despite this, in the peer-led pilot study a significant change in stress, self-compassion, and altruism was observed following MBSR;<sup>18</sup> however, these results may lack generalisability due to the small sample size of 30 students. Further research is necessary to deduce the feasibility of peer-led MBSR in MS, though this is a popular form of MBSR in medical education.<sup>25</sup>

**Implementation** Many studies incorporated MBSR into the existing modules within the curriculum, for example, professional development.<sup>10,13,14,23</sup> However, module credits or other incentives may undermine the understanding of mindfulness benefits outside of the course if students chose to participate for the wrong reasons.<sup>10,17,19</sup>

Qualitative analysis of attitudes of 140 MS towards extracurricular MBSR in one study revealed that such programmes would not be popular with students.<sup>13</sup> A further study found that the feasibility

of integrating MBSR during working hours was achievable despite competing with a high workload.<sup>14</sup>

**Compulsory or elective** A study of MBSR programs running from 2013 to 2014 found significantly higher satisfaction and engagement rates and lower levels of discontentment with an optional MBSR program compared with a compulsory one.<sup>23</sup> It is possible that these findings are attributable to prior knowledge of MBSR from the mandatory involvement in year 1, which provided additional motivation or promoted understanding of benefits in year 2 students during the optional component.<sup>19,23</sup> This study suggests that offering the course on a compulsory basis and thereby eliminating the aspect of choice, may undermine the desired outcomes of mindfulness. This could be overcome by notifying prospective students before they choose to attend a medical school with obligatory MBSR.<sup>14,23</sup> Conversely, results of an elective MBSR programme may not penetrate the population sufficiently to address the poor mental health within MS.<sup>26</sup>

### Limitations

The scarcity of male participant data in the literature is noteworthy as there are gender differences in emotion experience and expression and therefore MBSR may not have assisted males in handling stress.<sup>19</sup> This was highlighted in a study where MBSR only elicited a positive outcome in female participants.<sup>19</sup> It must also be noted that there is a significant lack of published research on the negative outcomes of MBSR.<sup>12</sup> The lack of data for males and potential publication bias mentioned may result in a misconceived idea that MBSR is beneficial for everyone.<sup>10,14,19,27</sup>

Additionally, despite higher rates of mental illness in MS, the literature addressing MBSR in clinical mental illness is scarce, thus imposing a significant challenge to extrapolate the evidence to address clinical anxiety or depression. If the course was to be offered as a core component of the curriculum, these issues must be addressed first to ensure safety.<sup>23</sup>

### Conclusion

There is evidence to support the role of MBSR in stress reduction and prevention of burnout and anxiety, however, mixed results have been reported with respect to depression and empathy. Long-term studies across a diverse MS population, including students with clinical mental illness, should be conducted to provide stronger evidence of MBSR effectivity. Future studies assessing the influence of MBSR on humanistic care may also support preliminary research that suggests MBSR can improve the quality of patient care.

MBSR appears to be largely accepted as a method to improve subclinical mental wellbeing in MS. This, however, is subject to the programme being integrated optionally, into the existing curriculum. Due to the scarcity of research in this area, particularly with respect to male students or the negative effects of MBSR, implementation on a compulsory basis cannot be confidently promoted based on current evidence. Further research into the outcomes of an elective modified MBSR programme, factoring the stressors in medical education with a trained facilitator, would make a valuable contribution to the field and to addressing mental health challenges in MS.

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