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## Mindfulness-based stress reduction for GPs:

results of a controlled mixed methods pilot study in Dutch primary care

### Abstract

#### Background

Burnout is highly prevalent in GPs and can have a negative influence on their wellbeing, performance, and patient care. Mindfulness-based stress reduction (MBSR) may be an effective intervention to decrease burnout symptoms and increase wellbeing.

#### Aim

To gain insight into the feasibility and effectiveness of MBSR on burnout, empathy, and (work-related) wellbeing in GPs.

#### Design and setting

A mixed methods pilot study, including a waiting list-controlled pre-/post-study and a qualitative study of the experiences of participating GPs in the Netherlands.

#### Method

Participants were sent questionnaires assessing burnout, work engagement, empathy, and mindfulness skills, before and at the end of the MBSR training/waiting period. Qualitative data on how GPs experienced the training were collected during a plenary session and with evaluation forms at the end of the course.

#### Results

Fifty Dutch GPs participated in this study. The MBSR group reported a greater decrease in depersonalisation than the control group (adjusted difference -1.42, 95% confidence interval [CI] = -2.72 to -0.21,  $P = 0.03$ ). Dedication increased more significantly in the MBSR group than in the control group (adjusted difference 2.17, 95% CI = 0.51 to 3.83,  $P = 0.01$ ). Mindfulness skills increased significantly in the MBSR group compared with the control group (adjusted difference 6.90, 95% CI = 1.42 to 12.37,  $P = 0.01$ ). There was no significant change in empathy. The qualitative data indicated that the MBSR course increased their wellbeing and compassion towards themselves and others, including their patients.

#### Conclusion

The study shows that MBSR for GPs is feasible and might result in fewer burnout symptoms and increased work engagement and wellbeing. However, an adequately powered randomised controlled trial is needed to confirm the study's findings.

#### Keywords

burnout, professional; empathy; general practice; general practitioners; mindfulness.

### INTRODUCTION

Burnout is highly prevalent in GPs. Almost 20% of Dutch GPs reported suffering from burnout, which is about twice the prevalence in the general population.<sup>1</sup> Dutch GPs are not alone in experiencing burnout as other international studies have also reported high burnout rates in GPs.<sup>2-5</sup>

Burnout has been described as a syndrome of emotional exhaustion, depersonalisation, and a diminished sense of personal accomplishment.<sup>6</sup> Burnout has serious negative consequences not only for the clinicians themselves but potentially also for patient care and clinical outcomes. Burnout may lead to reduced work satisfaction, disrupted personal relationships, substance misuse, depression, and even suicide.<sup>7,8</sup> Although patients seem unable to detect the effects of burnout on their GPs' consulting skills,<sup>9</sup> burnout can result in an increase in medical errors and reduced quality of patient care.<sup>10</sup> So this is not a case of doctors feeling sorry for themselves; rather, this is an issue that may also cause harm to patients. It is also making poor use of the scarce and expensive resource of experienced clinicians.

Research has suggested that mindfulness training can be useful in reducing stress and promoting self-care and wellbeing.<sup>11</sup> Mindfulness is defined as purposefully paying attention moment by moment, in a non-judgemental way.<sup>12</sup> Jon Kabat-Zinn introduced mindfulness in a medical setting

in the 1970s as an 8-week, group-based programme called mindfulness-based stress reduction (MBSR). MBSR was initially offered to patients with both chronic and somatic illnesses, such as chronic pain<sup>13,14</sup> and psoriasis,<sup>15</sup> and psychological symptoms, such as anxiety.<sup>16</sup> Research has shown that mindfulness can also reduce stress and burnout symptoms and increase empathy, self-compassion, and wellbeing in healthcare professionals.<sup>17,18</sup>

Krasner and colleagues<sup>18</sup> investigated the effects of an educational programme in mindful communication in 70 primary care physicians and found that the programme resulted in a reduction of burnout symptoms and an increase in empathy. In semi-structured interviews these physicians reported that mindfulness improved their ability to be attentive, listen deeply to their patients' concerns, and respond to them more effectively. They also reported greater self-awareness.<sup>19</sup> These findings were replicated with a controlled design in a mixed population of 68 healthcare professionals (physicians, nurses, social workers, and clinical psychologists).<sup>20</sup> A more recent uncontrolled pilot study in primary care clinicians ( $N = 30$ ) showed that an abbreviated mindfulness course was associated with reductions in stress and work-related burnout.<sup>21</sup>

The aim of the current study was to examine the feasibility and potential effectiveness of

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## How this fits in

Burnout is highly prevalent in GPs. Previous research has shown that mindfulness-based interventions may be effective in reducing burnout symptoms in healthcare professionals; however, these studies are often uncontrolled or conducted in mixed populations. This controlled pilot study shows that mindfulness-based stress reduction training for GPs is feasible and could result in fewer burnout symptoms and increased work engagement and wellbeing. However, additional research is needed, including a randomised controlled trial, to confirm these findings.

MBSR in Dutch GP trainers using a controlled design with both quantitative and qualitative outcome measures. The researchers hypothesised that MBSR training would be feasible and show positive changes in burnout symptoms, work engagement, empathy, and mindfulness skills. Using qualitative data, the researchers also hoped to generate interesting themes on the range of possible effects or mediating factors of MBSR training.

## METHOD

### Procedure and participants

GP trainers affiliated with two Dutch training hospitals (the Radboud University Medical Center [Radboudumc] and VU University Medical Center [VUmc]) were invited to participate in the study. Approximately 580 GPs are registered as GP trainers at Radboudumc and VUmc. They are expected to participate in the continuing professional development (CPD) offered by the department of general practice of their university on a regular basis. They usually receive information on the CPD programme well in advance to indicate their choice of courses. The CPD programme offered two MBSR courses, one in the autumn and one in the spring. Half of the MBSR course was taught in the time allocated to CPD; the other half was offered outside the CPD time slots, usually in the evenings or at weekends. Participating in the MBSR course accounted for 50% of the compulsory CPD for that year.

The study was designed as a pre-/post-waiting list-controlled study. Given their busy schedule, GPs showed a clear preference for the period they could attend and were allocated to the period of their choice. The group participating in the first term was the intervention group; the group participating in the second term was the waiting list control group. Online self-report questionnaires were administered to both intervention and

control groups before and immediately after the end of the intervention. The control group participated in the MBSR course 6 months later and were asked to complete the questionnaires again before and after the intervention.

### Intervention

During MBSR training, participants learned to focus their attention on the present moment and to observe their own thoughts, feelings, and behaviour in a non-judgemental way (meta-awareness).<sup>12</sup> The MBSR training in this study followed the programme developed by Jon Kabat-Zinn;<sup>12</sup> however, the sessions were focused on the issues faced by GPs. All the sessions started with a brief presentation and discussion of the session theme in the context of clinical practice and supervising trainees. Some of the themes discussed were: awareness of pleasant or unpleasant sensations, feelings, or thoughts; perceptual biases and filters; burnout; boundaries or conflict management; and self-care. Two courses took place at Radboudumc and two at VUmc. The programme at Radboudumc consisted of eight weekly sessions each lasting 2.5 hours, and a 1-day silent retreat between the sixth and seventh session. Four sessions took place at regular times throughout the CPD programme and were accompanied by additional evening sessions and a weekend day. At VUmc the programme consisted of two full training days during the CPD schedule followed by four additional weekly evening sessions of 2 hours and a 1-day silent retreat during the weekend. All participants were asked to practise at home for about 30–45 minutes a day. The MBSR training was taught by experienced MBSR trainers. At VUmc, the trainers were a GP/psychotherapist and a psychologist/psychotherapist; at Radboudumc the trainer was a consultant psychiatrist. All had received training in MBSR, had a long-standing personal practice, and were experienced in working with groups. All met the requirements of the good-practice guidance for teaching mindfulness-based courses of the UK Network of Mindfulness-based Teacher Trainers.<sup>22</sup>

### Quantitative data collecting and analysis

**Measures.** Burnout was measured with the Utrecht Burnout Scale for Contactual Occupations (UBOS-C), used for professions in which contact with other people constitutes a major part of tasks.<sup>23</sup> This is the validated Dutch version of the Maslach Burnout Inventory.<sup>24</sup> The UBOS-C consists of 20 items forming three subscales: emotional exhaustion, depersonalisation, and personal

accomplishment. Work engagement was measured with the validated Utrecht Work Engagement Scale.<sup>25</sup> This questionnaire consists of 17 items measuring three subscales: vigour, dedication, and absorption. Empathy was measured by using the validated, 20-item Jefferson Scale of Empathy (JSE).<sup>26</sup> Mindfulness was measured with the validated Five Facet Mindfulness Questionnaire (FFMQ). The FFMQ consists of 39 items representing five facets of mindfulness: observing, describing, acting with awareness, non-reacting, and non-judging.<sup>27,28</sup>

**Analysis.** Descriptive analyses were conducted for the demographic variables. Pre-test differences between groups were analysed with the Student's *t*-test. Post-test scores between the two groups were compared, correcting for baseline scores, using linear mixed models in SPSS (version 20.0). Participants in the waiting list control condition were included in both the intervention and control conditions. Effect size (Cohen's *d*) was calculated for the adjusted between-group differences post-treatment based on the pooled standard deviation (SD) at baseline.

#### Qualitative data collection and analyses

**Data collection.** Qualitative data were collected during the last MBSR session. As part of the MBSR curriculum, participants were asked to reflect on what they had gained from the course. Guided by the trainer, participants shared these individual experiences one by one for 45 minutes. With the participants' permission, this session was audiotaped at Radboudumc for both groups. The recordings were used for the analysis. At VUmc this session was not audiotaped because of practical reasons, but participants filled out evaluation forms on what they had gained from the course. The written evaluations were used for data triangulation.

**Analysis.** The oral reflections at the end of the MBSR were audiotaped and transcribed. The handwritten evaluation forms were also transcribed. Data were analysed using thematic analysis; this is a method used to identify and analyse patterns in qualitative data.<sup>29</sup> The six phases of thematic analysis proposed by Braun and Clarke were used.<sup>30</sup> The first phase, 'familiarisation of the data', was carried out independently by four different researchers reading and rereading the transcripts. The second phase, 'coding', involved the coding of the transcripts independently by four different researchers, analysing the text line by line. The third phase,

'searching for themes', consisted of looking for similarity between the codes and grouping similar codes together. The fourth phase, 'reviewing themes', included the independent analysis of transcripts again based on the different themes that were discussed earlier. The themes were critically reassessed. The last phases involved 'defining and naming themes' and 'producing the report'. In these phases, a more detailed analysis of each theme was developed and compelling quotes were selected. The remaining data (written evaluations) were used for theme verification, a process also known as data triangulation.<sup>31</sup>

## RESULTS

### Quantitative results

Fifty GP trainers, 18 from VUmc and 32 from Radboudumc, participated and received the first online questionnaire. The majority of participants were male ( $n=33$ , 66%) and their mean age was 54.9 years (SD 5.7). Most worked in a duo or group practice ( $n=45$ , 90%) and five (10%) worked in private practice. The mean duration of practice was 24.4 years (SD 6.3, range 14–39 years). Based on participants' preference, 30 GPs were allocated to the MBSR group and 20 to the waiting list (control) group. Due to the online system mistakenly operating on anonymous ratings, seven pre-test sets of questionnaires from the intervention group could not be attributed to an individual participant; therefore, these data had to be considered as missing. There were no significant differences in sociodemographic characteristics between the missing and non-missing questionnaires.

### Between-group differences at baseline

There were no baseline differences between the groups in age, sex, practice setting, and years in practice. However, the MBSR group did report significantly more depersonalisation, less work engagement, and fewer mindfulness skills than the waiting list group (Table 1). They also reported more emotional exhaustion (trend) and less work engagement (trend).

### Between-group differences at the end of treatment

Controlled for baseline scores, the MBSR group reported a greater decrease in depersonalisation than the control group ( $-1.42$ , 95% confidence interval [CI] =  $-2.72$  to  $-0.21$ ,  $P=0.03$ ). This did not apply to the other two subscales of burnout. Dedication increased more significantly in the MBSR group than in the control group (adjusted difference, 2.17, 95% CI = 0.51 to 3.83,  $P=0.01$ ). No significant differences were

**Table 1. Baseline characteristics of the intervention and control groups**

	MBSR (n=23)	Control (n=20)	P-value
Male, n (%)	16 (70)	12 (60)	0.52
Female, n (%)	7 (30)	8 (40)	
Age, years, mean (SD)	54.5 (5.3)	56.0 (6.7)	0.45
Years in practice, mean (SD)	23.4 (6.3)	26.3 (7.0)	0.22
Practice setting, n (%)			
Private	3 (13)	2 (10)	0.76
Partnered/group	20 (87)	18 (90)	
Emotional exhaustion (UBOS), mean (SD)	14.26 (8.25)	10.15 (6.28)	0.08
Depersonalisation (UBOS), mean (SD)	6.35 (3.50)	3.10 (2.79)	0.002 <sup>a</sup>
Personal accomplishment (UBOS), mean (SD)	34.00 (4.01)	34.50 (5.44)	0.73
Total work engagement (UWES), mean (SD)	61.80 (11.35)	67.76 (9.88)	0.08
Vigour	20.80 (3.97)	22.42 (4.32)	0.21
Dedication	22.48 (3.76)	26.05 (2.76)	0.001 <sup>a</sup>
Absorption	18.84 (4.87)	19.88 (4.91)	0.49
Empathy (JSE), mean (SD)	114.91 (9.67)	118.35 (10.09)	0.26
Total mindfulness (FFMQ), mean (SD)	132.39 (13.19)	141.0 (14.79)	0.05
Observing	26.17 (3.42)	25.89 (5.78)	0.85
Describing	28.35 (4.98)	29.00 (4.32)	0.66
Acting with awareness	25.91 (5.27)	29.11 (3.48)	0.03 <sup>b</sup>
Non-judging	29.39 (5.39)	32.84 (4.68)	0.03 <sup>b</sup>
Non-reacting	22.57 (3.42)	24.16 (4.31)	0.19

<sup>a</sup>P<0.01. <sup>b</sup>P<0.05. FFMQ = Five Facet Mindfulness Questionnaire. JSE = Jefferson Scale of Empathy.

MBSR = mindfulness-based stress reduction. SD = standard deviation. UBOS = Utrecht Burnout Scale.

UWES = Utrecht Work Engagement Scale.

found in the other work engagement subscales. Furthermore, mindfulness skills increased significantly in the MBSR group compared with the control group (adjusted difference 6.90, 95% CI = 1.42 to 12.37, P = 0.01). These were all moderate effects (Table 2).

### Qualitative results

Thirty-one GPs divided into two groups, 18 in the first and 13 in the second, attended the last MBSR sessions, which were audiotaped at Radboudumc. In total, 91 minutes of audiotaped reflections were collected. At VUmc, 17 GPs filled in the evaluation form.

Six themes emerged from the data; each theme is described below. Although most GPs stated that they learned and benefited from the training, it is important to note that two GPs did not; they stated that mindfulness did not really suit them.

**Theme 1: awareness.** One theme that emerged from the data was increased awareness. Participants mentioned that the training helped them to become aware of their bodily sensations, thoughts, and emotions. Some participants also became more aware of their beliefs and values. Often the GPs mentioned the recognition of mindlessness and autopilot mode they usually engaged in:

*'I have become very aware of the breathing, which suits me well. The breathing comes and goes in a harmonious manner and it is the foundation you are always carrying with you. It also gives me safety, it can bring me back to myself, and I even discovered it can be an indicator of how I feel at a particular moment.'* (GP, female)

*'Because of the training I'm often able to turn the switch during the day. For example, when having dinner or brushing my teeth; turning on the switch of awareness.'* (GP, male)

**Theme 2: recognising patterns.** The second theme was the ability to recognise patterns. Participants gained an insight into their own automatic patterns and were able to recognise and observe their own behavioural patterns. They were also able to notice their routines, when they were behaving as they always did.

*'I learned that I am a perfectionist and I have the tendency to prepare very well and anticipate, keeping up schedules of everything and everyone, which takes a lot of energy.'* (GP, female)

**Theme 3: change in patterns.** The next theme was about changing behavioural patterns. Participants could let go of old patterns. Some participants indicated that, by the acceptance of thoughts and emotions, they could put things in perspective and let things be. They were making more deliberate choices, taking rest occasionally, and setting limits; additionally, they were taking better care of themselves:

*'Sometimes at work I get upset, then with the use of this symbol (the cap of a kettle), I'll try to remember the mindfulness training and say to myself: "It's all right, try to reset, stay calm, it is not so bad." And I'll use it during the day at work, taking a cup of tea and letting it go, so I can communicate more calmly, openly, honestly, and more balanced with my patient.'* (GP, male)

**Theme 4: wellbeing.** Another theme was physical and mental wellbeing. Participants indicated that mindfulness helped them to balance and harmonise with increased energy and joy in life. In addition, they were able to relax more:

*'The "now" is beautiful and full of richness, as a human being and as a trainer.'* (GP, male)

*'Now, I occasionally don't do anything, just being instead of doing, which gives me energy.'* (GP, female)

**Table 2. Burnout, work engagement, mindfulness, and empathy at pre- and post-treatment of mindfulness-based stress reduction (MBSR), and control condition**

	Time	MBSR (n=43) <sup>a</sup>	Control (n=20) <sup>a</sup>	Difference between groups, post-treatment (95% CI) <sup>b</sup>	Cohen's d type effect size
Emotional exhaustion (UBOS)	pre-	13.17 (1.10)	12.44 (1.28)	-0.28 [-2.88 to 2.32]	0.04
	post-	12.57 (1.08)	12.11 (1.30)		
Depersonalisation (UBOS)	pre-	5.43 (0.49)	4.41 (0.59)	-1.42 [-2.72 to -0.21] <sup>c</sup>	0.41
	post-	4.82 (0.48)	5.22 (0.60)		
Personal accomplishment (UBOS)	pre-	33.85 (0.70)	33.95 (0.96)	0.51 [-2.32 to 3.34]	0.11
	post-	35.00 (0.67)	34.54 (1.00)		
Total work engagement (UWES)	pre-	64.51 (1.64)	64.40 (1.95)	1.91 [-2.32 to 6.15]	0.17
	post-	66.75 (1.61)	64.72 (2.00)		
Vigour	pre-	21.67 (0.61)	21.38 (0.74)	0.55 [-1.18 to 2.28]	0.14
	post-	22.43 (0.59)	21.59 (0.76)		
Dedication	pre-	23.49 (0.56)	25.04 (0.70)	2.17 (0.51 to 3.83)*	0.58
	post-	24.66 (0.55)	24.03 (0.72)		
Absorption	pre-	19.70 (0.67)	18.73 (0.82)	-0.58 [-2.48 to 1.32]	0.12
	post-	20.07 (0.65)	19.69 (0.84)		
Empathy (JSE)	pre-	117.40 (1.53)	116.18 (1.92)	0.20 [-4.54 to 4.93]	0.02
	post-	119.35 (1.49)	117.93 (1.98)		
Total mindfulness (FFMQ)	pre-	136.21 (2.23)	135.48 (2.65)	6.90 (1.42 to 12.37) <sup>c</sup>	0.47
	post-	143.08 (2.19)	135.45 (2.67)		
Observing	pre-	26.36 (0.69)	25.85 (0.82)	1.56 [-0.13 to 3.26]	0.30
	post-	28.40 (0.68)	26.33 (0.83)		
Describing	pre-	28.26 (0.72)	28.33 (0.90)	1.63 [-0.46 to 3.73]	0.35
	post-	29.77 (0.71)	28.20 (0.91)		
Acting with awareness	pre-	27.12 (0.71)	28.00 (0.90)	1.57 [-0.55 to 3.69]	0.33
	post-	28.10 (0.69)	27.41 (0.91)		
Non-judging	pre-	31.16 (0.81)	30.49 (0.98)	1.37 [-0.79 to 3.53]	0.26
	post-	32.36 (0.79)	30.32 (0.99)		
Non-reacting	pre-	23.34 (0.57)	23.12 (0.70)	0.75 [-0.79 to 2.29]	0.19
	post-	24.47 (0.56)	23.49 (0.70)		

<sup>a</sup>Adjusted condition means and standard error. Participants in the waiting list control condition were included both in the intervention and control groups. <sup>b</sup>Differences between conditions are adjusted for baseline values. <sup>c</sup>P<0.05. FFMQ = Five Facet Mindfulness Questionnaire. JSE = Jefferson Scale of Empathy. UBOS = Utrecht Burnout Scale. UWES = Utrecht Work Engagement Scale. On the UBOS, higher scores on the emotional exhaustion and depersonalisation subscales, and lower scores on the personal accomplishment subscale, indicate greater burnout. On the UWES, higher scores indicate greater work engagement. On the JSE, higher scores indicate greater empathy. On the FFMQ subscales, higher scores indicate greater levels of mindfulness skills.

*Theme 5: attitude towards oneself.* The fifth theme was about attitude towards oneself. Participants mentioned attitudinal changes towards themselves, aspects of self-acceptance and compassion. Some participants indicated that their own beliefs and values had changed; they became less judgemental, more open, more accepting, and were less striving. They were also able to be open to unpleasant experiences, acknowledging them instead of avoiding them:

*'I think mindfulness deals with — and these are serious words — a sort of unconditional right of existence, that all people have. And the consequence of that, for me, is that I*

*don't have to prove myself, that I can simply be the way I am. And that it is OK like that. And whatever I do or strive for is fine, but even without that, it is already fine.'* (GP, male)

*Theme 6: attitude towards others.* The final theme was about one's attitude towards others. Some participants indicated that mindfulness training taught them to accept others, including their patients, and to have compassion for them. This contributed to communication with patients:

*'One beautiful meditation I have been doing the last weeks and still like to do is the metta meditation, where you evoke a feeling of love towards your loved ones, and afterwards for yourself, the rest of the world, and people with whom you have difficulties. And I notice it gives me space.'* (GP, male)

*'This stone lies on the desk in my office. I use it when I'm stuck with my patient. I will have a look at the stone, breathe, and try to feel some love for the patient. It gives me some space and I can continue without being annoyed with my patient'* (GP, male)

## DISCUSSION

### Summary

This study examined the feasibility and effectiveness of MBSR training in a controlled, mixed methods pilot study. When offered as part of the regular CPD programme, MBSR appeared to be feasible and acceptable for GPs. There was a significant decrease in depersonalisation and an increase in dedication and mindfulness skills in the MBSR group compared with the control group. The qualitative data generated interesting themes on the range of possible effects or mediating factors of MBSR training. The data indicated that GPs became more aware and could recognise and change maladaptive patterns, such as perfectionism. MBSR also increased their wellbeing and helped them to develop a less judgemental and kinder attitude towards themselves and others.

### Strengths and limitations

One obvious limitation of this study is that, although it was the first controlled study of MBSR in GPs, participants were not randomised. There were important baseline differences between the GPs who participated in the MBSR course during the first period and those participating in the last period. The MBSR group reported higher levels of burnout and lower levels of work engagement and mindfulness skills than the waiting list group. This

difference could possibly be explained by some GPs experiencing more burnout symptoms and thus preferring to start with the MBSR course sooner rather than later. For this reason, future studies of MBSR in this population should try to aim for a randomised controlled design, even though it might not be easy to organise this in a population of busy GPs.

Additionally, because study participants were self-selected, they may have been very motivated to attend the MBSR course, thereby resulting in an exaggeration of the effect. A study among medical students also showed that students who were interested and participated in MBSR training reported more psychological distress than students who were not interested.<sup>32</sup> Therefore, when adopting self-selected sampling, those who are more distressed will be more likely to participate in stress-reducing interventions. However, this selection bias would have affected both groups.

Finally, the study did not include a follow-up period after the end of MBSR training. Therefore, the sustainability of the improvements remains unknown. Again, there is a pay-off between the obvious methodological advantages of a follow-up period and recruitment being hampered by the fact that GPs interested in participating in MBSR training might not be willing to wait for a long period of time when randomised in a waiting list control condition.

### Comparison with existing literature

The results of this study are pretty similar to those found in previous studies.<sup>11,18,21</sup> In contrast with other studies, there was no increase in empathy in the MBSR group.<sup>17,18,20</sup> One of the reasons for this may be because the student version of the JSE was used; this measured participants' opinions on empathic engagement in patient care rather than their own empathic behaviour. This is different from the healthcare professional version of the JSE used in other studies.<sup>33</sup>

### Implications for research and practice

As noted earlier, burnout is an important problem in GPs and the findings of this study suggest that MBSR may be an acceptable and effective intervention to help prevent and reduce this. In terms of feasibility, the fact that MBSR was offered as part of the regular CPD programme and accredited by the professional bodies was certainly a facilitating factor. Offering the course in the regular CPD time slots, and in the evening and at weekends also, made it easier for GPs to attend.

GPs found MBSR acceptable possibly

because the intervention is non-directive and self-exploratory. Participants were supported in engaging in their own personal process rather than given advice. Participating in a group with colleagues appeared to be supportive in terms of recognition, normalising stress symptoms, and allowing participants to learn from one another. Explicitly linking the weekly theme to the context of clinical care and supervising trainees at the start of the sessions also increased acceptance and facilitated learning.

Given the important baseline differences between the MBSR and control group in this controlled study, for future studies a randomised controlled design should be the preferred option. Based on the moderate effect size found for depersonalisation, the number of GPs required in such a trial should be 76 (38 subjects per arm) based on using ANCOVA analysis and an established correlation of 0.77 between the pre- and post-measurement in this pilot study. However, using a more realistic correlation of 0.60 between pre- and post-measurement would result in a sample size of approximately 120 subjects (60 subjects per arm).

Careful consideration should be given to the outcome measures. As the qualitative analyses indicate, future studies should focus on studying positive outcome measures such as psychological wellbeing and patient care in addition to reduction of negative outcome measure such as burnout or psychological distress. Furthermore, the qualitative data provide interesting results on potential mediating factors, such as compassion, which should be tested in future studies.

Due to their busy schedules and anticipated reluctance to postpone participation in an MBSR course during a particular period because of a randomised controlled trial (RCT), recruitment of GPs for such a study will probably not be easy. Attending with colleagues, being provided with a programme tailored to their needs, and being given accreditation as part of their CPD could balance this out. It may also be easier to recruit GPs for a trial with a credible active control condition, such as a peer supervision group, rather than a waiting list period. A different option might be to conduct a RCT about MBSR in GP trainees rather than GPs, as part of their training programme.

Decreasing burnout and increasing wellbeing in GPs with interventions like MBSR is important. However, research should also focus on the aspects of the job that make it hard and difficult for GPs to function well. Therefore, future research and policy should also focus on the underlying causes of burnout in GPs

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### Competing interests

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