EDITORIAL

Gambling with health

Rosalind Stanwell-Smith
Honorary Editor

Behaviour is only partly an individual moral issue; where behaviour harms the person, family, or wider community, it provokes demands for intervention. In the past, many harmful behaviours that were considered either a matter for the individual or for policing have been labelled public health issues: indeed, it is becoming difficult to identify behaviours and social ills that are not public health concerns. Some come into traditional social interventions, such as encouraging more exercise, although increasingly with a behavioural focus. The least active in society may benefit from telephone support, based on stages in the Behaviour Change Wheel framework.[1] Community exercise, with its social and motivational benefits, may especially help to reduce fragility fractures in sufferers of osteoporosis, but it needs public health leadership, not least in encouraging service collaborators and attendance.[2] Despite working through the stages of risk identification, awareness, and management, health assessments such as the five-year checks offered by the NHS for those aged 40-74 years, may not be sufficient to change behaviour independently. A cross-sectional study in Leicester showed variation in uptake between socioeconomic and demographic groups and no association with adopting a healthy lifestyle.[3] The pressure on clinicians to mediate behaviour as well as to treat the results of poor lifestyle may contribute to the high prevalence of stress in doctors – Locke and Lees identify that a review of the evidence base for interventions provides a useful summary of successful approaches, with the need for interventions to be tailored to particular specialties and contexts.[4] Pharmacists also play an important part in advising the public, and integrated pharmacy curricula are helping to ensure they have the appropriate knowledge and skills to do so.[5] Meanwhile, there is a shortage of health workers in rural and remote areas of several countries, leading to a 'mal-distribution' of clinicians which is beginning to be tackled via financial and social incentives, as well as fines for quitting posts.[6] Careful planning and institutional support are key features of these interventions, including monitoring, site visits, phone calls, and regional meetings.

For some risks to health there have been calls for mandatory controls, including the current controversial suggestion that children should not start school in the UK until there is evidence of completing the infant vaccination schedules.[7] With herd immunity declining for dangerous infections such as measles, the debate is timely, although, as with so many proposed public health actions, the dilemma includes how to educate the public about the complexity of vaccination. The issues include community and global health security as well as the rights of the individual. Compulsive gambling is a risk behaviour of a different sort, but now also a public health topic; mandatory control is not on the cards, so to speak, despite the existing legislation and licencing not deterring the determined gambler. Graham and Niemczewska[8] make a good case for the community and health impact of gambling addiction and the helpful role of mentoring, particularly from those with lived experience of gambling harm. The 18th century statesman and philosopher Edmund Burke said that gaming (i.e. gambling) is a principle inherent in human nature.[9] Gambling with our health may be a deeply rooted impulse, but behavioural approaches are gaining ground. Winning the health game means also cultivating a better understanding of the barriers and pressures on both the public and health professionals.

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A remote behaviour change service for increasing physical activity in people with chronic lung conditions: intervention development using the Behaviour Change Wheel

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Background

Physical inactivity is rising in the UK adult population, particularly in those with a long-term health condition.[1] People living with chronic lung conditions (e.g. Chronic Obstructive Pulmonary Disease, Bronchiectasis, Pulmonary Fibrosis) have lower daily physical activity levels compared to aged-matched healthy populations.[2,3]

Structured physical activity programmes, such as pulmonary rehabilitation, a face-to-face 6-8 week intervention, are one of the key treatments for chronic lung conditions.[4] However, across the UK there are barriers preventing people with a lung condition to attend these programmes including accessibility, under-referral and long waiting times.[5] Current evidence also suggests that completing short-term structured programmes does not always translate to long-term behaviour change (i.e. daily physical activity).[6]

Remote-based interventions, including web and telephone, can support change in physical activity behaviour.[7] These interventions, however, are not readily available for people with a lung condition in the UK. Third sector organisations such as the British Lung Foundation can support the availability of remote-based interventions targeting physical inactivity in people with lung conditions.

Service Development

The importance for having a theoretical basis for intervention development is well established.[8] The Behaviour Change Wheel (BCW) is a theoretically driven framework designed to enable the systematic development of interventions for supporting behaviour change.[9] At the centre of the framework, is the COM-B model, which sets out the need for a change in an individual's capability, opportunity or motivation for behaviour change to occur. We report the development of a new British Lung Foundation service for physical activity, to be delivered remotely, according to the key stages of the BCW:

Stage 1 (Understanding the behaviour)

The first step in using the BCW required defining and specifying the target behaviour. National surveys of physical activity in the UK define inactive populations as those completing fewer than 30 minutes of moderate-intensity equivalent physical activity per week.[1] The biggest gains in public health and the best value for public investment is in supporting the people who are least active.[1] As such, increasing the proportion of people with lung conditions who complete more than 30 minutes of physical activity per week was chosen as the focus of this service.

Having specified the target behaviour, the next step was to identify what needed to change ('behavioural diagnosis') to achieve the desired behaviour change. This required a full understanding of the barriers and facilitators to physical activity in people with lung conditions.

We performed a review of the literature (using PubMed) to support a behavioural diagnosis. The search strategy was structured around free text terms for the population (e.g. "COPD") and behaviour (e.g. "physical activity"). The search retrieved 250 articles, of which 5 were identified as relevant to intervention development. We held a workshop with health care professionals (n=3) and people with lung conditions (n=3) to further explore the beliefs of key exercise videos and optional pedometer s. The barriers and facilitators to physical activity were finalised and mapped to the COM-B model (Table 1).

Stage 2 (Identifying intervention options)

The next step of the BCW considers nine potential intervention functions that can bring about change in an individual's capability, opportunity and motivation, and seven policy categories that support the delivery of the intervention functions. An additional review of the literature was conducted to identify the available evidence on remote interventions. PubMed was searched for population terms (as in Stage 1) alongside free text terms for remote interventions (e.g. "digital", "text", "phone",

70 “web”, “app”). The search returned 1,566 results, of which 14 were deemed
71 relevant for further review.

72 The articles were reviewed for intervention functions, policy categories and
73 behaviour change techniques (BCT) according to the Behaviour Change
74 Technique Taxonomy (BCTTv1)[10]. We again consulted our stakeholder group to
75 provide their perspectives. Decision making on intervention functions and policies
76 was an iterative process and informed by the APEASE (affordability,
77 practicability, effectiveness, acceptability, side effects and safety, equity) criteria.
78 The intervention functions of ‘incentivisation’, ‘restriction’ and ‘coercion’ were
79 excluded for not meeting the APEASE criteria. The majority of studies with
80 positive outcomes in physical activity in the existing literature utilised the
81 intervention functions of ‘enablement’ and ‘education’. The functions of ‘training’,
82 ‘environmental restructuring’, ‘modelling’ and ‘persuasion’ were also deemed to
83 be appropriate for addressing what needs to change (Table 1). In terms of
84 delivery of these intervention functions, many policy categories were not deemed
85 practicable or acceptable including fiscal measures, regulation, legislation and
86 environmental/social planning. Intervention functions delivered through service
87 provision, supported by communications/marketing and use of existing physical
88 activity guidelines were deemed most appropriate.

Stage 3 (Identifying intervention content and implementation)

The final steps were to consider the relevant BCT and delivery mode of the intervention functions. The most frequently used BCT linked to these intervention functions in the extant literature were ‘goal setting (behaviour)’, ‘self-monitoring of behaviour’, ‘social support (unspecified)’, ‘information about social and environmental consequences’ and ‘adding objects to the environment’. Further review of the BCTTv1[10] and stakeholder discussions identified another 23 BCT that met the APEASE criteria (Table 1). A 12 month telephone (health coaching) intervention for each individual, supported by printed (information pack including an activity diary and wallchart) and digital resources (email newsletters, exercise videos and an optional pedometer), were agreed to be modes of delivery that met the APEASE criteria for people with lung conditions. The implementation of each BCT and the final design of the intervention content are provided in Table 1.

Potential impact and implications

The BCW enabled the systematic development of a telephone service for inactive people with lung conditions. The importance of physical activity in management of lung conditions is well recognised. Increased physical activity is associated with improved symptoms, quality of life and reduced health care use in people with lung conditions. An assessment of the feasibility and potential impact of this

new British Lung Foundation service is currently being undertaken in England, with the evaluation framework due to be reported in a subsequent paper. The findings of this evaluation will inform the potential scalability and transferability of this intervention for achieving wider public health impact.

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Table 1. Outline of the final design of the intervention, guided by the Behaviour Change Wheel. Behaviour Change Techniques, delivered by a remote service, have been identified as ways to address the intervention functions that are linked to barriers and facilitators of physical activity in people with lung conditions.

COM-B Component	Barrier	Facilitator	Related BCW[1] Intervention Function	Intervention components			Behaviour Change Techniques including the BCTTv1[2] code[3]
				Phone support	Information pack (sent to all participants at baseline)	Email newsletters (sent to all participants at month 1, 2, 3, 6, 9, 12)	
Psychological capability	Lack of knowledge of the importance of physical activity, including knowledge of family members	Knowledge of the importance of being active**Error! Bookmark not defined.**	Education	Provide information about the health benefits of physical activity and how it may alleviate symptoms of their condition Encourage participants to speak to their family/peers about the importance of being active with their condition Promote use of BLF's existing patient forum (Health Unlocked) to share experiences	Written health information about health consequences and social/environmental benefits – references to encourage participants to share this information with their friends and family Includes exercise video which has educational information from a clinician and a patient	Month 1 themed around the benefits of being active	5.1 Information about health consequences 5.3 Information about social and environmental consequences 6.3 Information about others' approval 9.1 Credible source 12.5 Adding objects to the environment
			Enablement	Help participants to find activities that they enjoy Support participants to set short, medium- and long-term goals for physical activity and outcomes important to them. Identify rewards and positive achievements Encourage participants to make plans to be physically active at a particular time on certain days of the week Support participants to identify specific personal triggers for physical inactivity and develop strategies to address these Review the patient's goals with the patient and how behaviour corresponds to agreed goals. Consider modifying goal accordingly	Includes guidance on getting started Includes guidance for goal setting Includes task on tracking progress which includes goal setting Includes activity diary for goal setting, action planning, self-monitoring, self-reward and goal review. Also prompts assessment of feelings after being active. Includes problem solving task for overcoming barriers Includes task to consider advantages and disadvantages of becoming active	Month 1 and 2 include references and tips on how to get started Month 6 themed around goal setting and tracking progress	1.1 Goal setting (behaviour) 1.2 Problem solving 1.3 Goal setting (outcome) 1.4 Action planning 1.5 Review behaviour goal(s) 1.7 Review outcome goal(s) 2.3 Self-monitoring of behaviour 5.4 Monitoring of emotional consequences 8.3 Habit formation 9.2 Pros and cons 10.9 Self reward
Physical opportunity		Access to resources, equipment and opportunities	Enablement	Use motivational interviewing to help individual to decide what activities might be best for participants to try	Includes suggestions for resources, national physical activity opportunities, activities of	Month 9 themed around different ways to be active	1.1 Goal setting (behaviour) 2.2 Feedback on behaviour

				Help participants to find activities in their local community or ways to be active at home Give practical information on local physical activity opportunities and transport links. This may include access to specialist services for individuals who require professional support Suggest mobile applications or activity websites	daily living, pulmonary rehabilitation and other activities Includes task about identifying different activities to try and space to record information Includes task to reduce sedentary time Includes exercise video which provides resource to do exercise at home Provide pedometers to those interested in walking or step-based goals (optional)		3.1 Social support (unspecified) 8.1 Behavioural practice/rehearsal 8.2 Behaviour substitution 12.5 Adding objects to the environment
Social opportunity	No one to be active with Lack of encouragement.		Enablement	Provide encouragement and social support Encourage participants to be active with friends and family Welcome family members on calls if requested Create personalised plans to be active which include family and friends Encourage participants who are motivated by the social side of physical activity to find groups to be active with Promote use of BLF's existing patient forum (Health Unlocked) as a source of social support and sharing experiences	Includes resources to support participants to be active, e.g. activity diary and A3 activity wallchart and prompts to be active with others	All include references to being active with family and friends	1.4 Action planning 3.1 Social support (unspecified) 7.1 Prompts and cues
			Modelling	Promote use of BLF's existing patient forum (Health Unlocked) as a source of sharing positive achievements	Includes exercise video which shows people with lung conditions being active and a case study from an individual with a lung condition	Month 3 includes case studies to reinforce facilitators and reduce barriers	4.1 Instruction on how to perform a behaviour 6.1 Demonstration of behaviour 12.5 Adding objects to the environment
			Environmental restructuring	Support the individual to restructure their social environment to encourage physical activity and to identify environmental/social stimuli to be active and use these to encourage physical activity	Includes exercise to identify difficult situations, sources of social support and social cues that will facilitate physical activity	Includes top tips to encourage environmental restructuring, e.g. placing trainers by the front door	7.1 Prompts/cues 12.1 Restructuring the physical environment 12.2 Restructuring the social environment

Reflective motivation	Psychological distress of COPD including fear, embarrassment frustration & disappointment.**Error! Bookmark not defined.** Perception of low importance of physical activity**Error! Bookmark not defined.**		Education	Increase knowledge of what activities will suit participants and what they may enjoy whilst encouraging them to commence at a level that is right for them and gradually increase over time Reframe negative cognitions related to being active and create more positive beliefs about physical activity. Provide participants with information/evaluative feedback based on their self-monitoring (also *Persuasion*)	Includes health information on the importance of physical activity Includes a task on how might life be different by becoming active and identifying advantages and disadvantages of change Provide pedometer to those interested in step-based goals (optional) and encourage use alongside monitoring in activity chart/diary	Month 1 themed around the benefits of being active Month 2 themed around managing breathlessness and associated emotions	2.2 Feedback on behaviour 5.1 Information about health consequences 5.3 Information about social and environmental consequences 9.2 Pros and cons 9.3 Comparative imagining of future outcomes 12.5 Adding objects to the environment
			Persuasion	Provide encouragement Increase self-efficacy to be active through motivational interviewing Help participants to develop a positive perception of being active. Reframe negative past experiences Inform the patient of how their patient reported outcome measures have changed since baseline at follow up intervals (also *Education*)	Includes health information on the importance of physical activity	Case studies included in each newsletter to aim to change perceptions of being active with a lung condition	3,1 Social support (unspecified) 2.7 Feedback on outcome of behaviour 5.1 Information about health consequences 5.3 Information about social and environmental consequences 13.2 Framing/reframing
Automatic motivation		Physical activity becoming a habit**Error! Bookmark not defined.**	*The intervention has been designed to facilitate physical activity becoming a habit, and thus automatic motivation is incorporated throughout the intervention as an outcome of the intervention functions described above.*				
			Training	Support participants to establish a daily routine and to make plans to be active at particular time on defined days of the week, so that these form habits over time Encourage the patient to record their weekly physical activity	A3 activity wallchart and activity diary to record activity and encourage habit creation Provide pedometers (or signpost to step counting apps to use on their phone) to those who are interested in step-based goals (optional) Includes exercise videos	Month 12 themed around habit creation	2.3 Self-monitoring of behaviour 8.1 Behavioural practice/rehearsal 8.3 Habit formation 12.5 Adding objects to the environment

[1]Behaviour Change Wheel
[2]Behaviour Change Technique Taxonomy Version 1
[3]BCT '9.1 Credible source' applies throughout the intervention as the intervention is delivered by the British Lung Foundation

Should childhood vaccinations be mandatory?

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There is broad agreement among public health actors that vaccines have a profound positive effect on individual and community health. For example, the World Health Organization (WHO) estimates that vaccines save between 2 and 3 million lives a year[1], and the National Health Service (NHS) advise parents that "Vaccination is the most important thing we can do to protect ourselves and our children against ill health"[2]. Despite assurances from public health actors – including WHO and NHS – that vaccines are safe[2-3], a significant minority of people in high-income countries are concerned about vaccine safety. In a recent global survey of over 140,000 people carried out by the Wellcome Trust in collaboration with the Vaccine Confidence Project, 75% of interviewees in the UK, 72% in the USA, 47% in France and 76% in Italy agreed with the statement "vaccines are safe"[4]. In the UK, the MMR (Measles, Mumps, Rubella) vaccine is the focus of safety concerns, largely as a result of debunked claims that it causes autism. According to another recent survey of 2,600 parents by the Royal Society for Public Health, 21% of parents in the UK thought that MMR was likely to cause unwanted side-effects and 10% of parents decided not give their child the MMR vaccine[5].

Highly contagious diseases such a measles require 90-95% vaccination coverage to achieve herd immunity – i.e., the point at which an infectious will no longer spread through a community. Concerns about vaccine safety have led to falls in vaccine coverage and outbreaks of vaccine-preventable diseases. For example, the number of confirmed measles cases have increased markedly in Europe, from about 5,000 cases in 2016, to 24,000 in 2017, 84,000 in 2018, and 90,000 in the first six months of 2019[6-7]. In August 2019 the WHO announced that the UK is no longer considered to be measles-free[6]. And the USA is currently suffering its worst outbreak of measles for over 25 years[8]. It is not surprising, therefore, that the WHO lists vaccine hesitancy as one of the top ten global health threats in 2019[9].

How should states respond to this public health crisis? In the USA, where childhood vaccines are mandatory but parents can claim exemptions for medical, philosophical or religious reasons, some states have moved to limit or eliminate non-medical exemptions. In 2017, the Italian government announced that children would not be allowed to attend school unless they were vaccinated. France increased the number of mandatory vaccines from 3 to 11 in 2018. Vaccines are not compulsory in the UK but in May 2019 the Secretary of State for Health and Social Care Matt Hancock said that he would not rule it out.

Moves to make vaccines compulsory were greeted with anger and resistance, particularly from the Five Star Movement and League in Italy and the Rassemblement National in France[10]. These parties are noted for their anti-establishment or populist stance, dividing the world into corrupt and arrogant establishment, and the people, who they claim to represent. They seized upon legislation making vaccinations mandatory as an example of elites and experts telling the masses what to do[11]. The issue of compulsory vaccination is framed as part of a broader debate about the right of the state to intervene in people's private lives. In other words, populist politicians invoke liberal ideas about the importance of individual freedom. This argument does not, however, stand up to critical examination, as it violates one of the key tenets of liberal political philosophy: John Stuart Mills "Harm Principle", which holds that it is justifiable to limit individual freedom when it prevents harm being caused to others[12].

The decision not to vaccinate is taken by parents but concerns the health of their children. Children are not their parents' chattels and they have the right to be protected from avoidable harm. Article 24 of the 1989 UN Convention on the Rights of the Child states that "Every child has the right to the best possible health"[13]. It seems reasonable to argue that failing to vaccinate one's child in the face of overwhelming evidence that vaccinations are safe and effective is denying them this right and that in such situations the state to intervene to make sure that the child has access to the best possible healthcare. In the USA, there have been 9 cases where vaccine refusal was the primary reason for child neglect proceedings and in seven of these the parents were found guilty[14].

What is more, refusing to vaccinate children can have wider negative impacts on society. When vaccination coverage falls below the level required for herd immunity, the risk of an outbreak rises. This is particularly problematic for people that cannot be vaccinated, which includes some of the most vulnerable people in society: for example, babies who are too young to be vaccinated and children suffering from cancer whose immune system is compromised by chemotherapy. From a liberal perspective, therefore, it is justified for the state to intervene in order to maintain vaccine coverage at a high enough level to assure herd immunity and ensure that unimmunised children are protected from harm.

The argument that mandatory vaccination amounts to unwarranted state intervention in family life is flawed. From a liberal perspective at least, it is hard to argue that the state does not have a responsibility to protect children – and society more generally – from potential harm as a result of a minority of parents' decisions not to vaccinate their children. But is mandatory vaccine legislation effective? Data from Italy and France indicates that recently enacted laws making vaccines compulsory have increased uptake and reduce the prevalence of vaccine-preventable diseases[15-17]. Data from the USA suggest that areas in which fewer children are vaccinated because of nonmedical exemptions have higher levels of vaccine-preventable diseases[18]. Nevertheless, it is important to consider that such laws might have a broader negative impact on public health if, as in Italy, anti-establishment parties seize on the issue to generate support and win power. Such movements might harm public health because they tend to focus on issues such as crime and security rather than health and welfare, and they advocate policies that exclude vulnerable groups such as migrants and minorities[19].

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A literature review of interventions to reduce stress in doctors

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Abstract

Aim: Stress is prevalent among doctors, and interventions are offered, often as part of their continuing professional development, to help doctors learn in the workplace about the recognition, prevention and management of the harmful effects of stress. The aim of this review was to examine existing research to ascertain the features of successful educational interventions with practising doctors and any factors that may affect outcomes.

Methods: We searched key databases for papers published between 1990 and 2017 on the themes of stress that included an education-based intervention and practising doctors. Using an inclusive approach to the review, a broad evaluation was made of the primary research using both quantitative and/or qualitative evidence where the study reported a positive outcome in terms of stress management.

Results: Review criteria were met in 31 studies of 1,356 originally retrieved. Three broad categories of interventions emerged from the coding process: mindfulness-type ($n = 12$), coping and solutions focused (CSF) ($n = 12$) and reflective groups ($n = 7$). There is evidence that these interventions can be successful to help doctors deal with stress. Based on the results from this review, an original guide is advanced to help educators choose an educational intervention.

Conclusion: Although evidence for some interventions may be 'hierarchically stronger', it is misleading to assume that interventions can be imported as successfully into any context. Factors such as medical specialty and health care systems may affect which intervention can be used. The guide offers an evidence base on which further research can be built.

INTRODUCTION

Stress seems to be increasingly prevalent among doctors. While some stress can be beneficial, work demands that are too onerous may cause harmful physical or psychological reactions. Serious consequences may include lost working days and personal distress.[1,2] Doctors are vulnerable to excessive work-related stress due to heavy work pressure, emotionally demanding roles and budgetary constraints.[3,4] They do not always prioritise their own health and wellbeing as illness is perceived as 'belonging to' patients.[5] To exacerbate the situation, doctors in the United Kingdom, like all National Health Service (NHS) staff, need to work longer due to a raised retirement age and in certain medical specialties there are additional recruitment and retention issues.[6] More recently, there has been heightened attention on the importance of the health and wellbeing of caring professionals and the resulting benefits (or risks) to patient care.[7–9] Interventions such as Schwarz rounds have been implemented with the aim of helping staff to reduce stress through being able to provide more personal and compassionate care.[10]

Practising doctors are generally left to their own devices to cope with stress. Although activities outside work are important to maintain and enhance wellbeing, doctors also need to engage with work in a 'nourishing' way.[11] This article focuses on educational interventions intended to help practising doctors learn ways to prevent, recognise and manage the harmful effects of stress. Interventions for this cohort are increasingly offered as a part of continuing professional development (CPD). Recently, other commentaries in this area have criticised the rigour and usefulness of existing research.[12–16]

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With the issue of stress among practising doctors being of utmost importance internationally in medical education and even beyond, we focused on what we can learn from existing studies, so this descriptive review focused on those interventions reported in the literature that have positive outcomes for doctors and their theoretical underpinnings and was guided by the following questions:

1. What are the successful educational interventions to recognise, prevent and manage the harmful effects of workplace stress for doctors?
2. What are the features of these interventions and any factors that affect their application?

Based on this review, an original guide has been produced to assist those involved in the support and development of doctors who wish to choose an intervention to manage the stress of doctors.

METHOD

We searched key databases (Medline, PsycINFO, ERIC, PubMed, Web of Science and Proquest) for peer-reviewed, English language articles published between 1990 (January) and 2017 (September) with use of the terms *doctor* OR *physician* OR *surgeon* OR *registrar* OR *psychiatrist* OR *general practitioner* AND *stress* OR *burnout* AND *education* OR *intervention*. The review was extended through web searches and using reference lists of articles found from database searches. We sought advice from an information specialist to help us design and maximise the search strategy. Initial searches were conducted of abstracts and subject heading (or MeSH). Educational interventions are taken to mean an intervention that is delivered in the workplace which aims to teach or develop those doctors in receipt of the intervention. Studies that focused on interventions to manage stress among medical doctors were included regardless of setting (e.g. hospital or community), specialty or country. For our review the intervention is the starting point so potentially it could have been provided to doctors who were healthy, highly or just (a little) stressed. Articles relating to other health professionals (e.g. nurses, advanced nurse practitioners (ANPs) or other health professional groups) were included where results specific to doctors were separated, or where it was reasonable to assume from numbers included and/or analysis, the doctor sub-group contributed to the results overall.

We kept a reflexive diary during the searching and analytical process in which we flagged issues about which articles were to be included. All papers were reviewed by both authors and any differences in perspective were discussed and resolved. One area of inclusion/exclusion that was subjected to especial scrutiny was how to determine whether an intervention was 'successful'. A variety of criteria for success were identified due to the studies including a mix of measures (from a broad range of instruments that exist) that focused on different aspects of stress (e.g. actual or perceived). We responded by selecting studies based on primary research using quantitative and/or qualitative measures that revealed some positive outcomes relating to the impact of the intervention on doctors' stress and related concepts relevant to the subject matter because of a found benefit to wellbeing. In this way, our approach is appreciative and inclusive. This departs from other reviews that have focused on quantitative empirical research and the exclusion of studies that we argue can bring useful learning and enable us to see different things.[13–16]

EPPI-Reviewer 4 software was used for the purposes of the research synthesis. We worked together to code each paper from the final selection of studies according to a set of emergent categories and then extracted key data, using a standardised template, so the studies could be compared. We sought to identify distinct groupings of the different types of interventions rather than focusing on one approach or lumping interventions together. This descriptive review systematically delved into the detail of the content of the different categories of such interventions that would be useful to those involved in the support and development of doctors. To draw out the broad practical implications for policy makers and practitioners, we sought to establish the characteristics of successful interventions and the factors that affect their use.

RESULTS

From 1,356 papers initially retrieved, 1,213 were excluded as not relevant to the scope of the review on the basis of screening the article title and abstract (e.g. stress incontinence). Of the 144 remaining articles, 61 did not include an intervention or medical doctors, 39 were not based on primary research, 7 found no improvement as a result of the intervention and 6 were not accessible or excluded because they were not English language publications. This left 31 studies in this review for closer examination of factors that lead to positive outcomes. Three broad categories of interventions emerged from the coding process: mindfulness-type ($n = 12$), coping and solutions focused (CSF) ($n = 12$) and reflective groups ($n = 7$). These studies are summarised in Table 1. Features highlighted are the educational intervention, country, participants, research design and measures and outcomes in terms of intervention success.

Mindfulness-type interventions

This category of studies involves interventions designed to help participants to learn to relax body and mind, of which the most well-known example currently is mindfulness. Mindfulness-type interventions include a mix of secularised forms of mindfulness (e.g. training in mindful awareness and relaxation) and also yoga and meditation which derive from spiritual traditions (i.e. Hinduism and Buddhism). Primarily individual-focused, the interventions are intended to engage participants in their own personal process to enhance their capacity to deal with stress and avoid burnout. Participants are encouraged to learn to be in the present, be non-judgmental and accepting. Interventions in this group have been used preventatively rather than being targeted at 'at risk' doctors (secondary level) or for

Table 1.

Summary of evidence of successful interventions.

	Intervention design	Country	Participants	Research design/measures	Outcomes/effectiveness
Mindfulness-type					
Amutio *et al.*[17]	Mindfulness-based stress reduction (MBSR). Phase 1 ($n=21$): 8× weekly sessions of 2.5 h over 2 months + 1 × 8-h retreat session. Required to practice 45 min each day. Phase 2 follow-up 20× monthly 2.5 h sessions	Spain	42 physicians	Randomised control trial (RCT) Pre- and post-test Five Facets of Mindfulness Questionnaire (FFMQ 2012) Smith Relaxation States Inventory (SRSI-3 Smith, 2007) Heart rate (HR) in beats per minute	After 8 weeks of MBSR training, significant positive changes found in the experimental group in mindfulness and all of the relaxation dimensions. Significant decreases in HR also found. No significant variations found in control group (except reduction in 'transcendence'). Results improved further during 10 months of maintenance phase.
Asuero *et al.*[18]	Mindfulness (modelled on Krasner's study) 8 weekly sessions of 2.5 h each and an intensive 8-h session where participants followed guided silent mindfulness practice	Spain	68 primary health care professionals (including 41 doctors)	Pragmatic RCT	Maslach Burnout Inventory (MBI). Profile of Mood States (POMS) questionnaire (for mood disturbance). Jefferson's questionnaire (empathy), FFMQ. Translated version of a questionnaire from University of Massachusetts Centre for Mindfulness. For intervention group, burnout decreased (small but significant), mood disturbance decreased (moderate, significant), empathy increased (small but significant), mindfulness increased (moderate, significant) Amutio *et al.*[17]
Fortney *et al.*[19]	Abbreviated mindfulness intervention. Group sessions and 10–20 min daily practice. 18 h total. Friday evening 3 h, Saturday 7 h, Sunday 4 h, 2 × 2-h follow-up evening sessions	USA	30 primary care clinicians (including 26 doctors)	Single sample pre- and post-design MBI, Depression-Anxiety Stress Scale 21 (DASS-21) Perceived Stress Scale (PSS) Resilience Scale (RS-14) Santa Clara Brief Compassion Scale (SCBCS)	Measures taken at four time points (i.e. baseline, 1 day, 8 weeks and 9 months post-intervention). Long-term benefits. Participants had improvements compared with baseline at all three follow-up time points. At 9 months post-intervention, they had significantly better scores on all MBI subscales. No significant changes on the RS-14 and the SCBCS.
Goodman and Schorling[20]	Mindfulness 8× weekly 2.5-h sessions plus an all-day session. Practices taught were body scan, mindful movement (yoga), walking meditation and sitting meditation	USA	93 healthcare providers including physicians from multiple specialties, nurses, psychologists and social workers practising in both university and community settings	Pre- and post-observational study MBI SF-12v2 self-perceived mental and physical wellbeing 10 questions from the cognitive failures questionnaire DASS 21 Oldenburg Burnout Inventory The Mindful Attention Awareness Scale	Scores on all MBI subscales improved significantly from before to after the course for both physicians and other healthcare providers. Mental wellbeing also improved significantly. Intervention had greatest effect on physicians who recorded higher levels of emotional exhaustion (EE) and depersonalisation at baseline.

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Table 1. (Continued)

Summary of evidence of successful interventions.

	Intervention design	Country	Participants	Research design/measures	Outcomes/effectiveness
Krasner *et al.*[21]	Mindfulness communication 8× weekly 2.5-h sessions plus an all-day session between the 6th and 7th weekly session and a maintenance phase (10 monthly 2.5-h sessions following the eight weekly sessions) Includes three techniques: mindfulness, meditation, narrative medicine and appreciative inquiry	USA	70 primary care physicians in family medicine, general internal medicine, paediatrics, or combined internal medicine and paediatrics	Pre- and post-test at baseline, 2, 12 and 15 months 2-Factor mindfulness scale (observe subscale and non-react subscale) MBI Jefferson Scale of Physician Empathy The Physician Belief Scale Big Five Factor scale (personality scale) Profile of Mood Scale	Over the course of the programme and follow-up, participants demonstrated improvements in mindfulness, burnout (EE/personal accomplishment and depersonalisation), empathy, physician belief scale, total mood disturbance and personality (conscientiousness and emotional stability).
Lemaire *et al.*[22]	Use of biofeedback stress management tool three times daily for a period of 28 days. Tool consisted of combination of rhythmic breathing, actively self-generated positive emotions and a portable biofeedback device	Canada	40 medical physicians from primary, medical and surgical specialties	RCT Measurements were taken from members of control and intervention groups twice weekly	Survey combining 15 items from the PSS and 25 selected items from the Personal and Organizational Quality Assessment–Revised Questionnaire. The mean stress score declined significantly for the intervention group but not for the control group.
Oman *et al.*[23]	Passage meditation 8-week training programme, 2 h per week. Based on passage meditation as part of eight point programme (Easwaran, 1978/1991)	USA	61 health professionals (physicians, nurses and chaplains and others) (58 completed)	RCT Pre-test, post-test and 8- and 19-week follow-up data were gathered on eight measures: perceived stress (14-item measure Cohen and Williamson (1988); Mental health (five items); Vitality (four items) with subscales from the Medical Outcomes Study (Ware, Kosinski, & Gandek, 2002); Burnout on MBI (Maslach, Jackson, & Leiter, 1996); Life satisfaction (5-item scale from Diener, Emmons, Larsen, and Griffin (1985))). Job satisfaction was measured with responses to a single item: 'Considering all aspects of my job, I would say that I am very satisfied with my job'	Statistically significant effects were observed on stress and mental health. Treatment effects on stress were mediated by adherence to practices. Stress reductions remained significant at 19 weeks. Evidence suggests this programme reduces stress and may enhance mental health. (Not however life satisfaction and job satisfaction.)

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Table 1. (Continued)

Summary of evidence of successful interventions.

	Intervention design	Country	Participants	Research design/measures	Outcomes/effectiveness
Ospina-Kammerer and Figley[24]	Respiratory One method (ROM) Relaxation technique that relies on verbalising the word 'one' during exhalation is designed to mitigate the impact of emotional arousal. Groups met once a week for four consecutive weeks to practise technique	USA	24 family physician residents	Quasi-experimental design pre- and post-test MBI (EE)	ROM did have an effect on EE scores.
Pflugeisen *et al.*[25]	Brief video module administered mindfulness programme run for 8 weeks, 90 min in-person trainings, weekly online video-module trainings and weekly teleconference coaching calls	USA	19 community hospital physicians	Pilot pre- and post-test study PSS MBI Kentucky Inventory of Mindfulness Skills	Statistically significant decreases in stress and increased sense of personal accomplishment were observed at end-of-programme and 8 weeks post-intervention. Significant increases in all mindfulness skills were observed at end-of-programme; these increases persisted at 8 weeks post-intervention.
Sood *et al.*[26]	Stress Management and Resiliency Programme (SMART). 90-min group session with two follow-up phone calls based on abbreviated adaptation of Attention and Interpretation Therapy (AIT). This programme was tested previously among Department of Medicine Faculty	USA	26 radiology physicians (22 completed)	Pilot RCT Connor Davidson Resilience Scale. PSS Linear Analogue Self-Assessment Scale Mindful Attention Awareness Scale	Statistically significant improvements in stress, anxiety, quality of life and mindfulness at 12 weeks was observed in the study arm compared to the wait-list control arm; resilience also improved in the active arm, but the changes were not statistically significant when compared to the control arm.
Verweij *et al.*[27]	MBSR intervention. Run at two settings and format slightly different	The Netherlands	50 general practice (GP) trainers	Controlled design as MBSR offered over two terms: those that choose first term were intervention group and those the second term were the waiting list control group. Pre- and post-intervention test for both groups Burnout measured using Utrecht Burnout Scale for Contractual Occupations (UBOS-C). (Dutch version of MBI). Also qualitative research – oral reflections of what participants gained from the course from one setting and written evaluations from another	MBSR group report did report a greater decrease in depersonalisation than the control group (but this did not apply to the other two subscales of burnout). Significant increase (moderate effects) in mindfulness skills among control group. No significant change in empathy. Qualitative data indicated that the MBSR course increased their wellbeing and compassion towards themselves and others, including their patients.

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Summary of evidence of successful interventions.

	Intervention design	Country	Participants	Research design/measures	Outcomes/effectiveness
Runyan *et al.*[28]	Wellness curriculum every Friday afternoon for 2 h during a 4-week rotation with four residents per cycle. For 3 months following the curriculum, residents were sent monthly emails with reminders about implementing self-reflection skills, journaling, gratitude, and mindful breathing. Mix of exercises, some didactic content and reflection	USA	12 family medicine residents	A pre- and post-design, with a 3-month follow-up on the same set of four assessment measures: MBI; Self-Compassion Scale, PSS, and Jefferson Empathy Scale	Descriptive statistics revealed positive trends on the mean scores of all the measures. Statistically significant improvement of the Mindfulness Scale of the Self-Compassion Inventory and the Jefferson Empathy Scale.
Bar-Sela *et al.*[29]	9× monthly Balint groups. Two cases, each session 1.5 h	Israel	15 oncology residents	Pre- and post-test	MBI and 'expectations' questionnaire. Burnout decreased in junior residents but increased in senior residents. But qualitative analysis revealed doctors were more able to help families deal with emotions and became more reflective.
Coping and solutions focused					
Arora *et al.*[30]	Mental practice (MP) in which people imagine themselves performing an action without engaging in the actual physical movements involved. 30 min of MP training protocol before conducting 5× virtual reality surgical techniques; control participants conducted an unrelated activity	United Kingdom	18 novice surgeons	RCT	Imperial Stress Assessment Tool (ISAT) comprising three measures: HR; salivary cortisol; and the State Trait Anxiety Inventory (STAI). Stress was assessed subjectively using the validated STAI questionnaire and objectively with a continuous HR monitor and salivary cortisol. Mental imagery was assessed using the validated mental imagery questionnaire. Comparing the MP group with controls, subjective stress (STAI) was lower for the MP. Objective stress was also significantly reduced for the MP group in terms of the average HR, maximum HR and cortisol. Significant negative correlations were obtained between stress and imagery, indicating that improved imagery was associated with lower stress.
Gardiner *et al.*[31]	9-h cognitive behavioural coaching workshop. Post-workshop, GPs received email follow-up support for 5–6 weeks, and an interview to assess progress on their goals	Australia	Australian rural GPs Intervention group ($n=69$), baseline group ($n=205$) and control group ($n=312$)	Quasi-experimental study using an intervention group of rural GPs and de-identified data for a baseline group and control group consisting of the remaining population of rural GPs in South Australia	Following attendance, participants were significantly less stressed than before coaching.

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Table 1. (Continued)

Summary of evidence of successful interventions.

	Intervention design	Country	Participants	Research design/measures	Outcomes/effectiveness
Gardiner *et al.*[32]	Cognitive behavioural stress management course over 5 weeks (15 h)	Australia	GPs. Intervention ($n=85$) and control ($n=25$)	Self-administered questionnaire at pre, +4 weeks and +12 weeks. Work related distress measures (seven items) Work-related morale measures (seven items) Quality of work life measure (six items) General psychological distress (GHQ) Coping with work events (28-item scale)	The GPs in the treatment group were significantly lower in GHQ.
Holt and Del Mar[33]	Individually targeted mailed intervention designed to promote changes in individual self-care strategies, based on CBT and the transtheoretical model of change	Australia	161 × GPs whose scores indicated that they were suffering from stress	RCT. GHQ 12 scale	The intervention group showed a significant reduction of stress measured on the GHQ 12 scale, not seen in the control group.
Isaksson Rø *et al.*[34] (note: related earlier study Isaksson Rø *et al.*[35] which reported results after 1 year)	Counselling intervention Based on a number of approaches including psychodynamic, cognitive, educational and motivational interviewing. It was designed to identify/reduce sources of stress and identify/modify coping strategies away from blaming or wishful thinking to problem focused strategies and seeking social support. Participants could choose to attend the intervention delivered in one of two ways, either a single day (6–7 h) one-to-one counselling session with a psychiatrist/occupational health specialist, or as a 5-day residential group course	Norway	'Help seeking' doctors already suffering from burnout. At baseline ($n=227$), +1 year ($n=185$) and +3 years ($n=184$)	Pre- and post-test at baseline, +1 and +3 years EE subscale of MBI, Cooper Job Stress Questionnaire, working hours and sick leave	Significantly reduced levels of EE, job stress and emotion focused coping strategies for base line to 1 year after the intervention, were maintained at 3-year follow-up.
Mache *et al.*[36]	Psychosocial skill training programme 12-week training programme Underpinned by CBT and solutions focused counselling, focusing on coping strategies, support between group members and goals for the future	Germany	85× junior doctors: intervention group ($n=42$) and control ($n=43$)	RCT Primary outcome measures included scales of the Perceived Stress Questionnaire, Brief Resilient Coping Scale, Questionnaire 'Self –efficacy Optimism and Pessimism' and Copenhagen Psychosocial Questionnaire	Significant improvement between baseline and follow-up scores on measures of perceived stress, resilience, self-efficacy and optimism in comparison to the control group.

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Summary of evidence of successful interventions.

	Intervention design	Country	Participants	Research design/measures	Outcomes/effectiveness
McCue and Sachs[37]	Stress management workshop (1 × half day (4 h)) to improve residents' coping skills consisting of: (1) learning and practising interpersonal skills that increase the availability of social support; (2) prioritisation of personal, work and educational demands; (3) techniques to increase stamina and attend to self-care needs; (4) recognition and avoidance of maladaptive responses; and (5) positive outlook skills	USA	64× paediatric doctors: intervention group ($n=43$) and control ($n=21$)	Quasi-experimental pre- and post-test (2 weeks before and 6 weeks after). Maslach burnout inventory and ESSI stress systems instrument administered to control and intervention groups 2 weeks before and 6 weeks after the intervention. Also group discussions and written workshop evaluation	Overall the ESSI Stress Symptoms Test Scores for participants showed significant improvements, while the non-intervention group's mean declined.
Nooryan *et al.*[38]	Emotional intelligence (EI) programme Session (1) learning about meaning and different types EI, concept of decisiveness, anxiety and different types of anxiety and its role in reducing the efficiency of doctors and nurses. Session (2) training on empathy, problem solving, flexibility, thought control, methods of replacing – v – thoughts with positive, relaxation techniques and methods of controlling anxiety. Session (3) methods of identification of oneself and others, and relationships with the others, independence, self-concept and impulse control	Iran	150× nurses ($n=120$) and physicians ($n=30$) Case group ($n=75$) (60 nurses, 15 physicians) and control groups ($n=75$) (60 nurses, 15 physicians)	Cross-interventional pre- to post-case and control group design was used and inferential study design implemented. Demographic questionnaire (10), Situational Anxiety Berger Questionnaire (20) Bar-on EI Questionnaire (133)	Training EI components reduced situation anxiety of nurses and physicians working in intensive care and their EI scores increased and situational anxiety score was significantly reduced.
Schneider *et al.*[39]	Health coaching, drawing on motivational interviewing and behaviour change theories to enhance physician wellbeing. This involved three to eight individual coaching sessions offered through the physician wellbeing coaching programme. In the initial 90-min session, a current and desired states health assessment was completed and a plan developed. Follow-up sessions lasted in the region of 30–60 min	USA	11 physicians and three health coaches	Qualitative evaluation via telephone interview	Qualitative evaluation showed that coaching helped to develop resilience through the development of skills and awareness concerning boundary setting and prioritisation (especially relating to work/life balance), taking better care of self and enhanced awareness of own feelings and stress. Participants felt the intervention had indirect benefit to patients due to their reduced stress levels.

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Table 1. (Continued)

Summary of evidence of successful interventions.

	Intervention design	Country	Participants	Research design/measures	Outcomes/effectiveness
Saadat *et al.*[40]	Wellness intervention consists of four components. (1) training on the identification of stressful situations and the use of effective problem-solving and communication skills, and strategies for increasing residents' social networks. (2) Instruction in approaches to modify cognitive and appraisal processes. (3) Emphasises stress management (e.g. deep breathing, muscle relaxation, healthy eating and exercise) and minimising the use of avoidance coping (e.g. reducing problem avoidance or use of alcohol to reduce tension, and teaching refusal skills). (4) Integrates the course material through the creation of participants' own personal stress management plans. 16 weeks 1.5-h weekly sessions	USA	58 Anaesthesiology residents	RCT residents were randomly assigned to one of three groups: (1) wellness intervention group, (2) no-treatment control with release time and (3) no-treatment control with routine duties. Role Quality Scale; Coping Strategy Indicator; STAI; Centre for Epidemiologic Studies Depression Scale; Cohen-Hoberman Inventory of Physical Symptoms; National Survey on Drug Abuse	Residents in the wellness programme reported significantly fewer stressors in their role as parent, increased social support at work, greater problem-solving and less anxiety as compared with one or both of the control groups. Also suggestive of reduced avoidance coping and alcohol consumption.
Wetzel *et al.*[41]	Mental practice as form of stress management training on coping strategies, mental rehearsal and relaxation	United Kingdom	16 surgical residents	Randomised, controlled, intervention study. State-trait-anxiety-inventory, observer rating, coefficient of heart rate variability (C HRV), and salivary cortisol. Interviews explored surgeons' perceptions of the intervention	Significant improvement observational teamwork assessment for surgery performance and increased coping skills and reduced stress reflected in HR variability. No significant changes were identified in the control group.
Winefield *et al.*[42]	Stress management seminars × 3 fortnightly. Session (1) discussion of problems faced at work; Session (2) discussed (a) satisfaction from medical work, (b) sources of social support and help, (c) changing expectations of oneself, followed by whole group relaxation exercise; Session (3) discussed practice management tips or enhancing social supports or wrote letter clarifying monitoring procedures, followed by circulation of tel. numbers	Australia	20 female GPs	Pre- and post-test GHQ; Warr *et al.* job satisfaction survey; and Maslach and Jackson's EE, depersonalisation and sense of personal accomplishment. Also seminar evaluations following each session and then 4 weeks after last session SE Thames Short Interactive Course Rating Scale	Standardised measures of psychological wellbeing showed significant reductions in work-related distress from the beginning of this low cost programme to the 4-week follow-up.

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Table 1. (Continued)

Summary of evidence of successful interventions.

	Intervention design	Country	Participants	Research design/measures	Outcomes/effectiveness
Reflective groups					
Kjeldmand and Holmström[43]	Balint groups containing 4–10 physicians with 1–2 leaders, meeting regularly over several years	Sweden	Nine GPs who had participated in Balint Groups for 3–15 years	Qualitative interviews/phenomenology	Themes reported: competence, professional identity, sense of security, enhancing GPs work satisfaction. 'Balint groups might thus help GPs handle a demanding work life and prevent burnout' (p. 138).
Koppe *et al.*[44]	Web based Balint group (via video conferencing). Eight to nine fortnightly sessions of 2 h each	Australia	14 rural GPs and 12 rural GP registrars (21 completed)	Pre- and post-test controlled trial and thematic analysis of qualitative data (pilot study)	Warr's work related affect, psychological medicine inventory, professional isolation scale. Participants also asked to rate overall experience of Balint Group. Balint participants' scores were significantly higher post-intervention on the psychological medicine inventory and Warr's work related affect scales than control group scores. Qualitative analysis revealed that participants appreciated opportunity for supportive relationships and personal change. Challenges included technology problems, time needed to become familiar with the process and time commitment.
Nielsen and Tulinius[45]	Reflecting team/supervision group, met ×1 per month ×10 per year, each session 3 h long. Had been running since 2000	Denmark	7 GPs	Qualitative case study of supervision group over a 5-month period. Methods of observation and interviews	Involvement in group resulted in change over time. Participants felt they could now handle patients who had been seen as tiresome as a challenge. Able to stay in job because of support from group. Themes From constant troubleshooting to continuous being Occupational overview of working conditions Dealing with compassion fatigue
Sands *et al.*[46]	Narrative training approach. 60-min training seminars over 6 weeks	USA	19 mixed group of doctors, nurses, social workers and therapists	Feasibility study (mixed methods). Pre- and post-test (+6 weeks) plus focus group	Interpersonal Reactivity Index (IRI) and the Stressor Scale for Paediatric Oncology Nurses (SSPON). Improvements in the IRI for empathic concern and perspective taking. Focus group indicated that teamwork and resilience improved in the 6 weeks of the seminar. Focus group also indicated improvement in team and relationship building. Stress levels did not decline, if anything made participants more aware of unfairness and suffering related to oncology.

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Table 1. (Continued)

Summary of evidence of successful interventions.

	Intervention design	Country	Participants	Research design/measures	Outcomes/effectiveness
Satterfield and Becerra[47]	Support groups of 7–10 members, groups met for 1 h each month, groups facilitated by psychologist and group therapist, followed for a period of 2 years	USA	62 × internal medicine residents	Mixed-methods longitudinal evaluation. Participant observation of groups by facilitator plus satisfaction/ impact survey at end of each academic year	Self-completed satisfaction and impact scales, plus open-ended questions. High satisfaction and attendance had a strong impact on wellbeing. Building supportive relationships with peers was most important strength of groups.
West *et al.*[48]	Facilitated, module based, physician discussion groups. 19 fortnightly for 9 months	USA	74 practising physicians in Department of Medicine	RCT Participants evaluated every 3 months during course of 9-month study and then 3 and 9 months after the study	Job Satisfaction Scale Empowerment at Work Scale Quality of life Medical Outcomes Study Short–Form Health Survey MBI PSS Depression screening Jefferson Scale of Physician Empathy Meaning and engagement in work improved (Empowerment at work scale) and depersonalisation (MBI) reduced with sustained results at 12 months. Differences in other domains of burnout and distress were not found.

CBT: Cognitive Behavioural Therapy.

Table 2. Implications of the evidence for the prevention of harmful stress among doctors.

	Mindfulness-type	Coping and solution focused	Reflective groups
Nature of intervention	Calming physiological effects achieved via: mindful awareness, meditation, relaxation and yoga exercise	Adoption of positive coping strategies (e.g. problem solving, seeking social support) and behaviour change	Support of colleagues, sharing concerns and learning new techniques
Medical cohort	Any medical doctor in mixed or single specialty groups 'Healthy' participants (not evaluated among doctors with depression or mental health issues) NB	Can be offered on an individual or group face-to-face basis or by mail 'Healthy' or 'struggling' doctors	Groups of doctors with shared clinical focus 'Healthy' or 'at risk' doctors
Required dose	Moderate to high doses (12 h–8 weeks+)	Moderate to low doses	Involvement over the longer term likely to be most effective
Pre-requisites	High levels of organisational resources Trained coaches Participants open to contemplative approaches Offered as part of CPD or as part of curriculum	Lower levels of organisational resource Delivery requires expertise in relevant theoretical approach, for example, motivational interviewing, cognitive behavioural therapy, emotional intelligence. Individual readiness to change	Aim of improving patient interaction/ empathetic understanding Openness to reflective approaches Not high resources, but long-commitment Skilled facilitation
Measurable impact	Statistically significant reductions in stress/burnout	Improvements shown on a variety of measures	Short-term impacts enhanced patient interaction Long-term measurable changes to stress/ burnout may require sustained involvement over time

CPD: continuing professional development.

those experiencing difficulties (tertiary level)[16] participants were screened out where they suffered from depression[22] or received psychiatric or psychological treatment.[17] Interventions were delivered to single[24] and mixed medical specialties,[22,25,21] as well as mixed teams of practitioners in clinical settings.[18–20,23] An additional focus of some of the studies is the improvement in relationships with patients and the quality of care.[18,21]

There is compelling evidence that these interventions are successful in reducing stress with some studies using randomised control trials (RCTs)[17,22,23] and controlled research designs.[18,24,26,27] Otherwise pre-/post-intervention-type research designs (including follow-up) are employed.[19–21,25,28] Quantitative measures are used in all studies with significant overlap in instrument types. Most commonly, stress is measured using the Maslach Burnout Inventory (MBI) and the outcomes of stress, that is, emotional exhaustion, depersonalisation and personal accomplishment.[49] Statistically significant improvements are reported in terms of reduced stress or burnout using some or all aspects of MBI.[18–21,23–25,27] There was a positive trend in relation to changes in doctors' skills in empathy and patient interaction[18,21] although not in all studies.[27] Where the studies measured the success of mindfulness at building resilience, the results were less positive with no significant changes reported post-intervention.

Mindfulness-type interventions can entail a significant commitment for both providers and participants. The full intervention that follows the original group-based programme, mindfulness-based stress reduction (MBSR), developed for patients in the United States in the 1970s, is 12 months long.[17,18,20,21,27] Between sessions participants can also be required to do homework or practice at home.[17,18,20,27] Interventions were taught in the time allocated to CPD[20,21,27] and offered in evening and weekend slots to fit in with doctors' workloads.[19,27] They were accredited by professional bodies[27] and participants may be awarded educational credits for participation.[20,21,23] The cost may fall to the participant to meet.[20] Abbreviated versions of mindfulness have been developed and these can produce significantly positive results for burnout. For example, Fortney *et al.*'s[19] study was based on what amounted to an 18-h intervention 'dose' and showed improvements on MBI. At 12 h, the brief video module administered mindfulness

programme[25] showed a statistically significant decrease in stress, an increased sense of personal accomplishment and greater mindfulness skills. Where a small amount of taught mindfulness-type activity is combined with other approaches (e.g. Runyan *et al.*'s[28] wellness curriculum, the delivery of which took a total of 8 h), there can be positive outcomes.

CSF approaches

These interventions are designed to help doctors recognise their own stressors, coping styles and thinking patterns and encourage change via the adoption of positive coping strategies. A move away from unhealthy coping strategies such as avoidance or alcohol consumption towards positive strategies of seeking social support and problem solving is encouraged.[40] An exception to this is Arora *et al.*'s[30] study on the use of mental practice in surgery. This intervention is uniquely focused on the implementation of a technique of mentally imagining the actions involved in carrying out surgical procedures without the associated gestures. A second study in this group incorporates mental practice into a broader curriculum on awareness of surgical stressors, coping strategies and relaxation techniques.[41]

CSF interventions work by offering physicians the tools to think and act differently. As a result, doctors may take action to reduce/remove the source of stress or to seek additional social support, reinforcing the positive results of the intervention. Isaksson Rø *et al.*[34,35] found that doctors who sought therapy following their intervention showed the largest move away from unhealthy coping styles. These interventions are underpinned by theoretical approaches to stress, coping and behaviour change. These include elements of cognitive behavioural coaching,[31,32,36] motivational interviewing,[39] mental practice,[30,41] emotional intelligence,[38] the transtheoretical model of change,[33] Pearlin and Schooler's hierarchy of coping mechanisms,[40] Duke Integrative Health Coaching Model[39] and the theory of surgical coping.[41]

Interventions in this category are typically used preventatively, but also as a form of assistance to doctors already suffering from increased stress.[33,34] It is suggested that evidence-based and less stigmatised interventions, such as cognitive behavioural coaching, are likely to appeal to doctors who, as a group, may be resistant to seeking help themselves.[31] There is good evidence across the studies that these interventions are successful in reducing stress, emotional exhaustion and enhancing coping. Quantitative measures are used in all but one study, although there is a range that mostly do not overlap with the exception of some that use the General Health Questionnaire 12 (GHQ12). This set of studies do not seek to measure any improvements relating to changes of doctors' skills in patient interaction.

Issues of 'dose' are less important for CSF approaches, with relatively short interventions (e.g. McCue and Sachs[37]) half day workshop and Winefield *et al.*'s[42] three sessions producing measurable results. In Holt and Del Mar's[33] study, significant improvements were shown as a result of participants receiving a mailed intervention only. It is not clear, however, whether the improvements shown from these short term/'low dose' interventions endure beyond the short term, as the majority of studies took post-test scores only a number of weeks after the intervention. Isaksson Rø *et al.*'s study[34] describes a higher intensity intervention where 'struggling' doctors were provided with either a single day (6–7 h) one-to-one counselling session with a psychiatrist/occupational health specialist, or as a 5-day residential group course. Improvements from baseline endured at a 3-year follow-up.

Reflective groups

Reflective groups are characterised by (usually single professional) groups of clinicians coming together with trained facilitators to discuss and reflect on challenging emotional and relational aspects of their cases. A strong feature of this design is the social support that derives from discussion and sharing with fellow group members. An important intervention within this group of studies is the Balint Group,[29,43,44,50] which has its origin in the work of psychoanalysts Michael and Edith Balint and employ a particular format for guided reflection. All of the interventions in this group of studies encompass elements of reflective discussion, with some also incorporating elements of small group learning.[46,48]

The evidence for effectiveness of these groups in reducing stress is less developed than for the other two groups of interventions. There is low consistency of measures in quantitative studies and a number have been evaluated by qualitative only approaches. In terms of quantitative measures, for example, Bar-Sela *et al.*[29] reported a decrease in burnout (on MBI) for junior residents, but an increase for senior residents. West *et al.*[48] showed a significant reduction on the depersonalisation scale of MBI, maintained at 12 months. However, West *et al.*'s[48] intervention incorporated additional elements alongside reflection, including elements of mindfulness. Koppe *et al.*[44] showed an improvement on Warr's Work Related Affect.

Qualitative findings from the broader group of studies show that participants appreciate the support gained through these groups and that over a sustained period of time, involvement in a Balint group has potential to reduce stress, burnout and compassion fatigue.[43,45] A focus group in Sands *et al.*[46] study showed that participants felt their teamwork and resilience had improved. Open-ended questionnaires in Satterfield and Becerra's[47] study showed that participants perceived that the groups had a strong impact on their wellbeing.

A number of studies also showed improvements in doctors' abilities to help families deal with emotions and psychological medicine skills.[29,44]

Features of successful educational interventions

Based on the 31 studies reviewed here, there is evidence in the academic literature that educational interventions can be successful in reducing harmful stress among doctors. Table 2 provides a summary of the evidence and displays the features of successful educational

interventions to manage the harmful effects of workplace stress for doctors. It can be applied in practice as a guide to help ascertain how and why possible solutions work and thereby guide educators as to which of these techniques may be useful in a particular situation. So, for example, if a doctor is mentoring or appraising a doctor who is 'struggling', the guidance recommends a CSF intervention. Those responsible for the design and delivery of CPD courses can see that mindfulness-type interventions have been used in this way previously, with positive effect. Practising doctors themselves can see the choice of strategies that may help them cope with stress.

DISCUSSION

This review has identified three main categories of interventions: mindfulness-type interventions, CSF approaches and/or reflective groups. These interventions are similar to those identified elsewhere but through greater inclusivity of evidence, without compromising rigour, and a deeper delve into the workings of successful interventions and their theoretical underpinnings, we have been able to signify what is unifying in terms of the features of these interventions and their impact in terms of the value in helping to reduce harmful stress among doctors.[12] Summarising the implications of the evidence about successful interventions produced a practical guide to help recommend an intervention although of course such interventions will be introduced into an environment that will affect whether and how it can be implemented. Here, we consider two important factors that may affect outcomes: medical specialty and the broader health system.

Time given over to reflection and discussion is likely to be more valued in certain medical specialties – particularly where high levels of emotional attunement and empathy are required (such as mental health or general practice). The only two interventions reported that were designed for surgeons followed surgery-specific mental practice techniques.[30,41] This reinforces the need for interventions to fit the particular medical specialty.

Mindfulness-types have a cost implication for the host organisation and potentially the participant themselves. From the perspective of a cash-strapped NHS, this may not currently feel like a viable option. The broader health system may, at least in part, explain the predominance of US-based studies for this group of interventions. On the other hand, within the espoused medical culture of the NHS, coping is held up as a necessary and admirable quality – coupled with the prevalent discourse around resilience.[11,51] Doctors may feel less stigmatised by attending CSF interventions, but this may just serve to detract attention away from the systemic causes of stress and burnout.[52]

Linked with this point is the issue of how easy doctors may find it to admit that they are experiencing, or at risk of, harmful stress and therefore how open they are to seeking help. Kinman and Teoh[53] point out that for doctors, the stigma associated with mental health difficulties may mean that doctors do not wish to disclose them for fear of being judged as not coping, or may even fear sanctions or job loss. In this review, only two studies (using CSF techniques) targeted doctors known to be already suffering, or at risk of, psychological distress.[33,34] Both these studies recruited from outside the workplace which perhaps is an important consideration of how to reach those that may be harder to engage in workplace interventions. Other interventions were offered on a more 'universal' nature, or actively screened out those suffering from stress or burnout – which perhaps may inadvertently reinforce any stigma. Kinman and Teoh[53] point out that a culture change is necessary whereby support is offered from the start of medical training throughout the career trajectory, stigma is challenged and help-seeking encouraged. It is also important that workplace stressors are acknowledged and addressed. It may be that workplace interventions that offer inclusive recruitment techniques (such as Schwartz rounds that are open to all staff) accompanied by 'normalizing discourses' around the universal need for support may contribute to such a culture change.

Limitations to our review include the fact that measures used in the studies focused on different aspects of stress including, for example, perceived stress, the outcomes of stress (e.g. MBI), stress and wellbeing (e.g. GHQ12). Reporting improvements in terms of reduced stress and burnout using MBI needs treating with caution as the developers of this measure define burnout only as having high scores on all three scales rather than one or two.[54] Furthermore, the studies could not all use the same type of measures as there is the issue of whether quantitative techniques exist that are suited to the measurement of the more subtle and relational benefits that may be expected from participation in reflective groups. Although evidence for some interventions may be deemed by some as 'hierarchically stronger', it is misleading to assume that interventions can be imported as successfully into any context. Our guidance (Table 2) highlights a range of strategies and some of issues involved.

CONCLUSION

Given the pressures that doctors are currently under and the potentially harmful stress this creates for them personally as well as for their colleagues and patients, it is timely to draw attention to possible solutions to assist with the management and prevention of this international-widespread issue. Our contribution to the field is the identification of the learning points from the literature about three main categories of interventions and the presentation of guidance to advance the field of education in relation to the support and development of doctors. Future research could further investigate the influences of medical cultures across specialties and geographies on the utility and acceptability of particular interventions.

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