Systematic review of interventions to improve the psychological well-being of general practitioners

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Systematic review of interventions to improve the psychological well-being of general practitioners

Marylou Murray¹, Lois Murray² and Michael Donnelly¹,³

Abstract

Background: The health of doctors who work in primary care is threatened by workforce and workload issues. There is a need to find and appraise ways in which to protect their mental health, including how to achieve the broader, positive outcome of well-being. Our primary outcome was to evaluate systematically the research evidence regarding the effectiveness of interventions designed to improve General Practitioner (GP) well-being across two continua; psychopathology (mental ill-health focus) and ‘languishing to flourishing’ (positive mental health focus). In addition we explored the extent to which developments in well-being research may be integrated within existing approaches to design an intervention that will promote mental health and prevent mental illness among these doctors.

Methods: Medline, Embase, Cinahl, PsychINFO, Cochrane Register of Trials and Web of Science were searched from inception to January 2015 for studies where General Practitioners and synonyms were the primary participants. Eligible interventions included mental ill-health prevention strategies (e.g. promotion of early help-seeking) and mental health promotion programmes (e.g. targeting the development of protective factors at individual and organizational levels). A control group was the minimum design requirement for study inclusion and primary outcomes had to be assessed by validated measures of well-being or mental ill-health. Titles and abstracts were assessed independently by two reviewers with 99% agreement and full papers were appraised critically using validated tools.

Results: Only four studies (with a total of 997 GPs) from 5392 titles met inclusion criteria. The studies reported statistically significant improvement in self-reported mental ill-health. Two interventions used cognitive-behavioural techniques, one was mindfulness-based and one fed-back GHQ scores and self-help information.

Conclusion: There is an urgent need for high quality, controlled studies in GP well-being. Research on improving GP well-being is limited by focusing mainly on stressors and not giving systematic attention to the development of positive mental health.

Keywords: Primary care, General practitioners, Mental health, Well-being

* Correspondence: mmurray881@qub.ac.uk

¹School of Medicine, Dentistry and Biomedical Sciences, Centre for Public Health, Queen’s University Belfast, Institute of Clinical Sciences, Block B, Royal Victoria Hospital, Belfast BT 12 6BA, UK

Full list of author information is available at the end of the article

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How this fits in: This review has identified a research gap in terms of mental health promotion and disease prevention interventions aimed at GPs especially those that focus on improving the positive or ‘flourishing’ concept of well-being.

Background
Within healthcare systems the degree to which they are based on a primary care model relates positively to the delivery of efficient, cost-effective and high quality care [1]. However as the volume and complexity of clinical work increases, with concomitant rising administrative and bureaucratic burden, there are reports of rising levels of work-related stress and falling job satisfaction that raise concern about the future of primary care [2]. Top stressors identified in 2015 were increasing workloads, changes to meet the requirements of external bodies, insufficient time to do the job justice, paperwork and increasing patient demand [2]. Although most GPs report this workload as generally manageable they describe it as negatively impacting on the quality of patient care [3]. In addition to workload concerns recruitment and retention problems continue to escalate [4, 5]. The proportion of GPs intending to quit direct patient contact in the next five years continues to increase annually with 60.9 % of GPs over 50 years age reporting this intention in a recent UK survey [2].

A more pathogenic work environment appears to be developing for a population already known to be at risk of mental ill-health including burnout, depression and addiction [6–14]. Given the importance of work-related health there is a pressing need to find and appraise ways to protect and improve GP mental health.

There is a paucity of evidence on mental ill-health prevention in GPs and reviews of occupational well-being interventions have reported few studies in those working in primary care [15, 16]. A biomedical model of well-being based on a single continuum ranging from healthy worker through sickness absence to returning to work underlies most work-related health promotion [17]. Recent research developments in well-being, positive and organizational psychology [18–20] have provided an opportunity to broaden the scope of mental ill-health prevention towards the more distal concept of mental health promotion. The latter aims to create environmental conditions that empower and enable optimum health and development whilst the former aims to reduce the risk or recurrence of mental ill-health [21].

Over the past decade consensus has been emerging from leading well-being researchers as to what constitutes optimum mental health. Former advocates of either a hedonic (pleasure seeking/happiness) perspective or a eudaimonic (meaning/functioning) perspective now recognize the requirement to incorporate elements from both to capture the construct of optimum well-being or ‘flourishing’ [22–24]. This has been conceptualised as representing one end of a single continuum from mental illness [25]. Another theoretical perspective is the two continua model where languishing to flourishing represents a related but separate continuum to the presence or absence of mental illness. The resultant quadrants provide a more complete view of mental health recognising possibilities including those of positive mental health with concurrent mental illness; absence of mental illness with low positive mental health (languishing); presence of mental illness with low mental health and the optimum state of positive mental health with the absence of mental illness (flourishing). This model recognises the possibility of mental health optimisation via interventions that develop psychological resources and capacities [26–28].

There remains debate about constituent elements within flourishing. Our detailed discussion of this and the operational definition of well-being developed for the purpose of this review concluded that ‘it is a multi-dimensional construct that comprises the core dimensions of (i) positive affect, (ii) personal relationships and social engagement and (iii) a life view that is meaningful and optimistic’ [29].

This is the first systematic review of studies of interventions across and within the two continua of ‘mental illness to absence of mental illness’ and ‘languishing to flourishing’. This comprehensive model of well-being is best suited to our combined mental health promotion and mental illness prevention approach. The review aims to evaluate the research evidence regarding the effectiveness of interventions designed to improve GP well-being with either a mental ill health focus or a positive mental health focus or both. This comprehensive approach facilitates exploration of the extent to which research developments and reviews in positive psychology and organizational studies may be integrated within existing health to illness approaches to promote ‘flourishing’ among GPs.

Method
The review followed the methodology specified in our PROSPERO-registered protocol and conforms to Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines [30].

Sourcing Information
A specialist subject librarian assisted in the development of a search strategy designed to identify internationally recognised terminology in peer-reviewed journals. Full details of this strategy are available in the published protocol [29].
A scoping review informed the selection of databases. Six databases were searched from inception until January 2015: Cochrane Register of Trials, MEDLINE, EMBA SE, PsycINFO, CINAHL and Web of Science. Only studies published in English language peer-reviewed journals were eligible. This decision was made at the protocol stage due to concerns about potential heterogeneity in constructs across languages following operationalisation of the term ‘well-being’. (In practice the paucity of evidence identified did not merit such stringent parameters).

Selection criteria
As we aimed to evaluate research evidence for the effectiveness of GP well-being interventions a control group was the minimum design requirement for a study to be included and only studies (including mixed-occupational group studies) in which GPs were the primary participants were eligible.

In recognition of various perspectives on well-being eligible interventions included ‘distal’ or ‘proximal’ approaches to well-being improvement. Distal-level interventions (mental health promotion) comprised, for example, strategies that promoted protective factors including the development and application of personal strengths and psychological capacities. Examples of proximal interventions (mental illness prevention) included efforts designed to promote early help-seeking behaviours, raise mental health awareness and address stigmatisation. In addition to an operational definition of well-being the protocol provided a process to resolve potential disputes in this context regarding the eligibility of interventions.

Primary outcome measures included validated tools that measured either mental illness such as the General Health Questionnaire (GHQ) [31] or positive mental health such as the Warwick Edinburgh Well-being Scale [24].

Studies designed to improve patient management by increasing GP knowledge and clinical skills enhancements were ineligible as were studies of interventions (such as rehabilitation and return-to-work programs) that were delivered at a tertiary level to GPs recovering from mental ill-health. Consensus between reviewers (MM, LM) on eligibility across all criteria was attained without arbitration from the third (MD).

In a two stage study selection process titles and abstracts were assessed independently by two reviewers (MM and LM). The study selection pilot identified 99% agreement. The third reviewer (MD) provided additional quality control by screening 10% of the titles during Stage 1 of the selection process. In Stage 2 full texts of studies appearing to meet inclusion criteria were independently assessed by two reviewers (MM and LM) to ascertain eligibility. Reasons for excluding studies were recorded and tabulated (see Table 1 ‘Summary Table of Excluded Studies’ and Additional file 1 ‘Full Table of Excluded Studies’).

Data extraction
Data were managed using REFWORKS. The agreed data extraction form included identification features, study and participant characteristics, intervention details, outcome measures and results.

Quality assessment
Each eligible study was appraised critically for key methodological aspects using the Cochrane Risk of Bias Tool [32] and the Quality of Assessment Tool for Quantitative Studies [33]. (see ‘Risk of Bias’ and ‘Table of Quality Assessment’)

Data synthesis
Results were organised and configured in narrative format as recommended by the experienced reviewer (MD) following detailed descriptive tabulation. The eligible studies were not considered to be of sufficiently good quality and fit to conduct a meta-analysis.

Results
Following de-duplication 5392 studies were screened. Of the thirty-three studies that were assessed at Stage 2 twenty-nine were excluded. Main reasons for exclusion at this stage included lack of intervention and uncontrolled study design. Four studies met the methodological and design criteria for inclusion. (See Additional file 2 PRISMA Flow diagram; Table 2 Included Studies.) The total number of GP participants was 997. All of the eligible studies used outcome measures indicative of a mental ill-health focus.

There were two controlled before and after studies and two controlled clinical trials. The control group in Gardiner et al (2004) [34] comprised GPs who attended Continuous Professional Development (CPD) courses of similar duration but with different aims and content. Respondents to a survey carried out in 2005 by the same RDW Agency that recruited volunteer GPs for the intervention group were the comparator group in the Gardiner et al. (2013) study [35]. Some of these ‘controls’ may have volunteered subsequently to attend the intervention. The control group in the Holt and Del Mar study comprised GPs who, similar to GPs in the intervention group, had a baseline GHQ-12 ‘case’ score of ≥3 [36] Asuero et al had a wait list control group formed after stratified randomisation of primary care workers (physicians, nurses, others) recruited to attend a mindfulness education programme [37].

Two studies used the GHQ-12 [31] as the primary outcome measure. Both Gardiner et al. 2004 and Holt
and del Mar 2006 report significant short-term improvement in psychological distress indicated by GHQ-12 scores despite substantial differences in duration and content of their interventions. Asuero et al. reported significant improvement in burnout, mood disturbance, empathy and mindfulness immediately post-intervention. Long-term follow-up of mental ill-health was not reported in any of the studies. No measures of positive mental health or flourishing were reported.

Interventions in both Gardiner et al. studies had a cognitive-behavioural basis. They were delivered in different formats. Cognitive-behavioural stress-management techniques were taught in 15-h over 5 weeks in Gardiner et al. (2004) while in Gardiner et al. (2013) GPs were group coached in cognitive-behavioural techniques addressing issues such a coping skills and time management during a 9-h ‘retreat’ with 5-6 weeks individual follow-up via e-mail. In contrast to that approach Holt and Del Mar used baseline GHQ results to develop a mailed brief, individually-tailored guide that interpreted GHQ scores to increase awareness about mental health risk among GP intervention ‘cases’ and provide them with self-help advice. Awareness also underpinned Asuero et al’s mindfulness based education programme. This was modelled on an earlier uncontrolled study set in primary care that reported evidence of decreased burnout and mood disturbance using mindfulness-based stress reduction principles [38]. Asuero et al delivered 28 h of group psychoeducational activities over 8 weeks with weekly sessions that included didactic presentations on awareness of thoughts, feelings, self-care and setting boundaries; formal mindfulness meditation (facilitating non-judgemental awareness); narrative and appreciative inquiry (looking for the positive in organizations by identifying current and potential processes that work well [39]) and group discussion. Consistent with original mindfulness-based stress reduction programmes this intervention also had an 8 h session of guided silent mindfulness [40].

The interventions focussed on self-awareness and amelioration of stress response consistent with a mental illness prevention approach. There were not any studies identified that appeared to be designed to promote positive mental health, flourishing. All studies reported statistically significant short-term improvement in psychological distress. Risk of bias was rated high in 4 categories for both Gardiner studies and in 2 categories for the remaining studies. Table 3 Risk of bias. Global quality rating using the Quality of Assessment tool for Quantitative Studies for all studies was weak. Tables 4 and 5.

| Table 1 Summary of excluded studies |
|------------------------------------|
| Reason for exclusion              | Number | Studies                                      |
| Population not GPs                | 6      | Bolton 2001; Hankir 2014; O’Reilly 2007; Ospina-Kammer(from Krasner); Rahe 2002; Rowe 1999 |
| No intervention                   | 11     | Bluestein 2011 - Commentary Firth-Cozens 2001 - Proposals for interventions Gardner 2005 - Survey Gutkin 2003 - Commentary Hansen 2013 - Qualitative investigation of strategies Hickner 2014 - Commentary Latha 2004 - Overview of clinical environment MacLean 2009 - Commentary Sim 1996 - Commentary Sim 1997 - Systematic review Taub 2006 - Ethical guidelines |
| Uncontrolled before and after study | 7      | Dunn 2007 (from Gardiner [34]); Fortney 2013; Gardiner 06; Krasner 2009; Manocha 2009; Margalit 2005; Winefield 1998. |
| Cohort study                      | 4      | Place 2013; Ro 2007; Ro 2010; Ro 2012 |
| Qualitative evaluation            | 1      | Schneider 2014 |
| TOTAL                             | 29     |

Discussion

Summary

Our review aimed to evaluate systematically the research evidence regarding the effectiveness of interventions designed to improve GP well-being with either a mental ill health focus or a positive mental health focus or both and to explore the nature and extent to which research developments in positive mental health may be integrated within existing ‘illness to health’ approaches to promote ‘flourishing’ among GPs. It identified a paucity of evidence across the mental ill-health continuum and no studies specifically designed to effect change within the positive mental health continuum. The focus was mainly on mental illness prevention rather than mental health promotion. All studies were assessed as high risk of bias using the Cochrane Risk of Bias tool. The Quality Assessment Tool for Quantitative Studies (recommended...
| Author/Year | Country | Population | Intervention | Comparator | Study design | Outcome measures/Timepoints | Numbers analysed | Results |
|-------------|---------|------------|--------------|------------|-------------|-----------------------------|-----------------|---------|
| Gardiner et al. [34] | Australia | 86 GPs elected to attend a cognitive behavioural management course for which they gained Continued Professional Development (CPD) points | 15 h over 5 weeks. Cognitive behavioural management. | 24 GPs attending similar length CPD courses. Reported as being slightly older. | Controlled before and after study | Work-related distress (WRD -7 items Max score 49 = high distress) | Intervention group (IG) T1 = 86 T2 = 77 T3 = 62 Control group(CG) T1 = 24 T2 = 19 | WRD- Higher = more distress IG v CG pre v post-intervention ANOVA F = 2.99 p = 0.09 T1-T3 in IG F = 9.8 p = 0.000 |
| Murray et al. BMC Family Practice (2016) 17:36 | Setting – metropolitan area Adelaide | IG 50-59 years 32.9 % CG 50-59 years 42.9 % | 2. Have a beneficial effect on coping styles | 3. Improve morale through problem-focussed coping | Work-related morale (WRM – 7 items Max score 49 = high morale. Poor = 29) | Exclusions 0 Withdrawals 0 | WRM Rating morale as ‘poor’ IG v CG pre v post-intervention ANOVA F =2.1 p = 0.15 T1-T3 in IG F = 12.6 p = 0.000 |
| | | | | | Quality of working life (QoWL – Rate statements 1-7. Max score 42. ‘Poor’ = 22) | Loss to follow-up IG T2 = 9 T3 = 24 CG T2 = 5 | QoWL Rating quality as ‘poor’ IG v CG pre v post-intervention ANOVA F =2.0 p = 0.016 T1-T3 in IG…… F = 14.0 p = 0.000 |
| | | | | | | | GHQ IG v CG pre v post-intervention F = 11.9…p = 0.001 T1 = T3 in IG F = 28.2 p = 0.000 |
| | | | | | | | CwWE IG v CG pre v post intervention No significant difference |
Table 2 Included studies (Continued)

Gardiner et al. [34] Australia 312 Rural GPs in reference group used to determine actual retention rate;
69 Rural GPs in intervention group who volunteered to attend a work/life balance retreat advertised by Rural Doctors’ Workforce Agency (RDWA)
205 Rural GP respondents to RDWA survey in control group
Majority were male, 2/3 aged 30-50 years.

Baseline data from RDWA survey reported in Gardiner 2005.205/440 respondents to survey were used as the control group for the intervention.
The entire population of rural GPs (312) was used to calculate actual retention rate at 42 months after the intervention
Controlled before and after study.

9 h Work/life balance retreat.

Format
Group and individual CB coaching,
Pre-retreat – Drs’ issues,
subjective stress ratings, validated stress questionnaire.
Post retreat—letter to self at 4 weeks, e-mail follow-up and support for 5-6 weeks,
Interview to assess goals at 10 weeks, validated stress questionnaire.

Over 3 years 8 retreats were held.

Rural Doctor Distress (RDD)
(Customised 10 item scale graded 1-7 where 1 = not at all)
Doctors’ Intention to leave rural practice (ITL)
(Rated by IG on scale 1-7 where 1 = not at all)
Actual retention rate of rural GPs (ARR)
(Calculated by comparison of IG with de-identified data from RDWA database)
Outcomes collected at

T1 = Pre-intervention
T2 = 3 months after intervention
T3 = 42 months after intervention

RDD reported
T1 T2
ITL reported
T1 T2 ARR reported T3

Intervention group
IG n = 40
Control group n = 205
Of 69 GPs who volunteered to attend 48 completed post-intervention questionnaires T2 but only 40 were eligible due to inconsistencies in personal codes.
Actual retention rate IG v CG 79.5 % v 79.5 %
Chi² p = 0.027

Holt & Del Mar [36] Australia 819 GPs respondents to questionnaire
233 GPs eligible for inclusion in study as had GHQ-12 ≥ 3
Of the 819 questionnaire respondents 552 were male.

Aim
Need for broader organizational approach to occupational stress

Format
Mailed intervention consisted of letter with feedback on GHQ score,
Control group
(CG) n = 113
Intervention
n = 78

Questionnaire respondents with GHQ-12 score ≥ 3 were divided into 2 groups.

Controlled trial
GHQ-12 itemUsed to detect psychological distress and changes within the same population.
Scores classified as 0-2 = none to mild psychological distress 3-7 = mild to moderate

Intervention group
n = 78
Control group
n = 83
Analysed both as intention to treat and then excluding the 26 GPs who attended a

Intervention
 GHQ-12 scores Analysed by intention to treat IG pre and post-intervention Change = 3.39
 CG pre and post-intervention Change = 2.25 IG v CG
 Difference of

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Table 2 Included studies (Continued)

| Reference                | Country | Setting                        | Intervention                                                                 | Format                                                                 | Aims                                                                 | Outcomes collected and reported at | Lost to follow-up |
|--------------------------|---------|--------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------------|------------------|
| Martin & Asuero et al.   | Spain   | Primary health care centres in Catalonia. | Mindfulness-based psychoeducational activities. | Weekly sessions included educational presentations; formal mindfulness meditation; narrative and appreciative | To assess the effectiveness of the training programme designed to reduce burnout and mood disturbance, to increase empathy and to develop mindfulness. | Pre-intervention/baseline T1 = 3 months post-intervention T2 | IG T2 = 42 CGT2 = 30 |

**Intervention group (IG) n = 120**

- 8-12 = moderate to severe.
- Concurrent educational programme.

**Control group (CG) n = 120**

- Analysed after excluding data from 26 GPs.
- Difference of means 1.44 (0.18, 2.77) p = 0.03

Results for GPs attending the educational program showed that 62% scored ≤ 2 on GHQ-12.
### Table 2: Included studies (Continued)

| Materials/Homework | Description | Perspective Taking | 'Standing in the Patient’s Shoes' | Degree of Empathy | Five Facets Mindfulness Questionnaire (FFMQ) |
|--------------------|-------------|--------------------|-----------------------------------|-------------------|---------------------------------------------|
| Inquiry exercises  | Participants paid $68 for packs containing a CD recording of exercises with an explanatory booklet. Home practice was expected. | | | | Observing, describing, acting with awareness, non-judging, non-reactivity rated on 5 point Likert where 1 = never/very rarely, 5 = very often/always. 39 items |
| and group discussion. | There was an 8 h guided silent mindfulness session. | | | | |
| | | | | | |
| Mean between group difference 11 [3–19] | | | | | p < 0.01 |
| | | | | | |
| SES 0.9 | | | | | SRM = standardized response mean. Calculated as mean change in score divided by the standard deviation of the change. |
| | | | | | SES = standardized effect size. Calculated as mean difference between groups divided by standard deviation of the control group. Values > 0.8 = large changes |

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for use in non-randomised intervention studies [41])
deemed them to be ‘weak’ in quality.

The findings reported in the four included studies sug-
gest that cognitive-behavioural-based and mindfulness-
based programmes delivered in a group format may re-
duce GP distress at least in the short-term. Increasing
awareness generally and with specific regard to thoughts,
beliefs, self-care, personal health and setting boundaries
appeared to improve GP mental health. Potential mecha-
nisms include the support afforded by professional
peer-groups; cognitive-behavioural techniques that ad-
dress emotional distress by modifying ‘maladaptive’
thoughts and thought patterns [42] and strengthening
personal resources for optimising health through mind-
fulness practices [40].

Well-being interventions in healthcare professionals
The development of potentially effective well-being in-
terventions for GPs currently requires exploration of
evidence within other occupational groups. A recent
Cochrane review of occupational stress interventions for
healthcare workers (defined by them as any worker
employed in a healthcare setting such as a nurses and
doctors including medical and nursing students) found that
cognitive-behavioural training (approximately one third
of the 58 studies) had relatively poor impact reducing
stress by only 13% compared to no intervention over
periods from one month to two years [15]. Only 5% of
studies included medical doctors and there were not any
GPs. Delivery to a group over circa 6 weeks was the
usual format. Coping skill enhancement was a common
ingredient. Other interventions included guided relaxation
in various forms (n = 21) and organizational changes (n =
20). The review found low-moderate quality evidence for
both physical relaxation (e.g. massage) and mental relax-
ation (e.g. mindfulness) - stress levels were reduced by
23% compared to controls. Although intervention hetero-
genrety precluded precise identification of potentially
active ingredients, these results suggest that approaches
that address cognitions and relaxation techniques merit
further study.

Further evidence of the potential benefit of a
mindfulness-based approach was identified in an addi-
tional study which met all our inclusion criteria except
the English language restriction as it was reported in
Spanish. It was included in a meta-analysis which found
that cognitive, behavioural and mindfulness-based inter-
terventions significantly reduce stress in doctors [43]. This
RCT-evaluated, 10-week mindfulness-based intervention
reported significant reduction in stress and anxiety among
Spanish GPs that persisted at six-month follow-up [44].
Four of the 12 studies in this meta-analysis involved med-
ical students (who also reported a significant reduction in
stress). Most interventions were mindfulness-based and
directed at hospital-based doctors.

Elucidating ‘what works’ to improve doctor well-being
is difficult due to the paucity of studies. Comparisons
between, for example, medical students and experienced

| Bias | Gardiner et al. [34] | Holt and Del Mar | Gardiner et al. [34] | Asuero et al. [37] |
|------|---------------------|-----------------|---------------------|-------------------|
| Random sequence generation (selection bias) | High – Allocation by preference of participant | Unclear – Insufficient information provided about sequence generation | High – Allocation by judgement of participant | Unclear – Insufficient information provided about sequence generation |
| Allocation Concealment (selection bias) | High – Explicitly unconcealed procedure | High – Insufficient information provided | High – Explicitly unconcealed procedure | Unclear-Insufficient information provided |
| Blinding of participants and personnel (performance bias) | High – Blinding of participants and personnel was not possible | High – Blinding of participants and personnel was not possible | High – Blinding of participants and personnel was not possible | High – Blinding of participants and personnel was not possible |
| Blinding of outcome assessment (detection bias) | High – Self-reported outcomes | High – Self-reported outcomes | High – Self-report for Rural Doctor Distress and Intention to leave. | High Self-reported outcomes |
| Incomplete outcome data (attrition bias) | Unclear – Insufficient reporting of attrition to justify ‘low’ risk | Low – Clear participant flow reported | Unclear – Insufficient reporting of attrition to justify ‘low’ risk | Unclear–Baseline table indicates there were dropouts in the intervention group. No details provided |
| Selective reporting (reporting bias) | Low – The published report includes all expected outcomes | Low – All outcomes reported | Low – The published report includes all expected outcomes | Low-All outcomes reported. |
| Other bias | Unclear – Insufficient information to assess whether other important risk of bias exits | High – Concurrent educational program effecting 26 participants. 14 in intervention group did not receive the intervention as a consequence. Control group contamination possible. | Unclear – Insufficient information to assess whether another important risk of bias exits | |
### Table 4 Quality assessment using EPHPP tool for quantitative studies

| Components | Gardiner et al [34] | Holt and Del Mar [36] | Gardiner et al [34] | Asuero et al. [37] |
|------------|---------------------|-----------------------|---------------------|---------------------|
| Selection Bias 1. Are the individuals selected to participate likely to be representative of the target populations? | Self-referred/elected therefore using dictionary definition this scores 3 = NOT LIKELY | Participants were those respondents to a questionnaire found to score above a threshold. Questionnaire sent to all GPs in 8 Divisions of General Practice in Australia. 2 = Somewhat likely | Self-referred therefore using dictionary definition this scores 3 = NOT LIKELY | Self-referred/elected to attend. Subsequent stratified randomization reported. 2 = Somewhat likely |
| Selection Bias 2. What percentage of the selected individuals agreed to participate? | 1 = 80-100 %. By electing to attend participants were agreeing to participate | Baseline questionnaire response rate 819/1356 = 60 % 60 % = 2 | 69 Volunteered to attend but cannot tell how many actually participated 5 = Can’t tell | 1 = 80-100 % All eligible volunteers agreed to participate. |
| SELECTION BIAS RATING | WEAK | MODERATE | WEAK | MODERATE |
| Study design | Controlled before and after study | Controlled clinical trial | Controlled before and after study | Controlled clinical trial |
| Was the study described as randomized? | No | Yes | No | Yes |
| Was the method of randomization described? | No | No | No | No |
| Was the randomization process appropriate? | Not applicable | No | Not applicable | No |
| STUDY DESIGN RATING | MODERATE | MODERATE | MODERATE | MODERATE |
| Were there important differences between groups prior to the intervention? | 1 = Yes Control group more likely to be in solo practice, older and had more years in practice | 3 = Can’t tell Authors report mean comparison of baseline GHQ scores showed no significant difference prior to the intervention (p = 0.09). No other information provided on pre-intervention confounders | 3 = Can’t tell. Control group for psychological well-being outcome were respondents to a survey. Control group for actual retention were entire population of rural GPs. | 3 = Can’t tell Authors report that intervention group was larger due to high interest in the intervention. |
| Were important differences between groups controlled? | Can’t tell = 4 Controlling for confounders not explicit. | Can’t tell = 4 | Can’t tell = 4 | Can’t tell = 4 |
| CONFOUNDERS RATING | WEAK | WEAK | WEAK | WEAK |
| Were the outcome assessors aware of the intervention status of participants? | Yes = 1 | Yes = 1 | Yes = 1 | Yes = 1 |
| Were the participants aware of the research question? | Yes = 1 | Yes = 1 | Yes = 1 | Yes = 1 |
| BLINDING RATING | WEAK | WEAK | WEAK | WEAK |
| Were data collection tools shown to be valid? | Yes = 1 | Yes = 1 | Yes = 1 | Yes = 1 |
| Were data collection tools shown to be reliable? | Yes = 1 | Yes = 1 | Yes = 1 | Yes = 1 |
| DATA COLLECTION RATING | STRONG | STRONG | STRONG | STRONG |
| Were withdrawals and drop-outs reported in terms of numbers/reasons? | Yes = 1 | Yes = 1 | No = 269 volunteers, 48 questionnaires completed post-intervention. No information on those 21 given. | No = 2 Drop-outs from intervention group mentioned in baseline table. No details provided however results in scales approximate in remainder of tables. |
| DATA COLLECTION RATING | STRONG | STRONG | STRONG | STRONG |
| Percentage of participants completing the study | 84 % = 1 89 % IG 79 % CG | 161/233 = 69 % = 2 | 57 % = 3 63 % IG 51 % CG | 100 % = 1 |
Clinicians, physicians and nurses, and primary- and secondary-care doctors provide only limited insights due to pre-existing significant differences. Arbitrary categorisation of intervention type, relatively small sample sizes and simple study designs makes it difficult to achieve clarity and certainty regarding essential active ingredients and mechanisms of effect across various intervention approaches. Whilst there is scope within e.g. mindfulness approaches for mental health promotion the emphasis in healthcare professional well-being interventions appears to be on mental illness prevention (psychopathology continuum). There is negligible evidence within this population for interventions designed to empower and enable optimum mental health through the development of personal resources thereby promoting flourishing.

**Organizational approaches to well-being**

The creation of empowering work environments through organisational-change interventions has received even less research attention than person-directed interventions (focussing on individuals). Organizational approaches to mental health promotion include enhancing the flexibility of working hours [45, 46], implementation of anti-bullying policies [47, 48] and leadership training [49, 50]. Despite sound theoretical underpinnings, empirical evidence for organizational interventions remains limited.

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**Table 4** Quality assessment using EPHPP tool for quantitative studies (Continued)

| WITHDRAWALS AND DROP OUTS RATING | STRONG | MODERATE | WEAK | STRONG |
|-----------------------------------|--------|----------|------|--------|
| What percentage of participants received the allocated intervention? | Follow-up data for 77. Cannot tell if all 86 received the intervention. | 106/120 = 88 % Score = 1 | 48/68 = 60 % Score = 2 | 100 % Score = 1 |
| Was the consistency of the intervention measured? | Not explicitly Cannot tell = 3 | Not explicitly Cannot tell = 3 | Not explicitly Cannot tell = 3 | Described as ‘essentially the same’ and delivered by the same qualified instructor. No explicit report of measurement of consistency. Cannot tell = 3 |

| Is it likely that subjects received an unintended intervention that may influence results? | No = 5 | Yes = 4 Concurrent educational programme which 26 of the study participants attended. Analyses were made with and without them. | No = 5 | No = 5 |

| Unit of allocation | Individual | Individual | Individual | Individual |
|-------------------|------------|------------|------------|------------|
| Unit of analysis  | Individual | Individual | Individual | Individual |
| Are the statistical methods appropriate for the study design? | Yes = 1 | Yes = 1 | Yes = 1 | Yes = 1 |
| Is the analysis performed by intervention allocation status (ITT) rather than actual intervention received? | No = 2 | Yes = 1 | No = 2 | No = 1 |

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**Table 5** Summary of Global rating for Quality using EPHPP Quality Assessment tool for Quantitative Studies

| Component                  | Gardiner et al [34] | Holt and Del Mar [36] | Gardiner et al [34] | Asuero et al. [37] |
|----------------------------|----------------------|-----------------------|----------------------|--------------------|
| Selection Bias             | Weak                 | Moderate              | Weak                 | Moderate           |
| Study Design               | Moderate             | Moderate              | Moderate             | Moderate           |
| Confounders                | Weak                 | Weak                  | Weak                 | Weak               |
| Blinding                   | Weak                 | Weak                  | Weak                 | Weak               |
| Data Collection Methods    | Strong               | Strong                | Strong               | Strong             |
| Withdrawals and Dropouts   | Strong               | Moderate              | Weak                 | Strong             |
| GLOBAL RATING              | WEAK                 | WEAK                  | WEAK                 | WEAK               |

Criteria for global rating: 1. Strong = no weak ratings, 2. Moderate = one weak rating, 3. Weak = two or more weak ratings.
The aforementioned Cochrane review identified 21 study arms examining the effect of organizational change in preventing occupational stress in healthcare workers. These included changing working conditions, provision of support and mentoring, communication skills training and improving work schedules. Shorter or interrupted work schedules were found to decrease stress levels however no clear benefit of other interventions was identified. They concluded that organizational interventions should be more focussed on addressing specific stressors [51].

Empirical evidence for organizational approaches is limited and often includes individual-based approaches. In a review of ‘burnout prevention’ interventions for various occupational groups, only 2/25 interventions were organizational in nature and focus [16]. Cognitive-behavioural therapy (CBT) was the single most common intervention (6/25). Only four of the seventeen person-directed interventions produced sustained benefit up-to-one-year compared to five of the six combined (person-directed and organizational) interventions suggesting that workplace mental health programmes should include an integrated approach.

Resilience
Resilience enhancement is common to both organizational and person-directed interventions. Furthermore it can be integral to both mental health promotion and mental illness prevention programmes. Definition of resilience and specification of what constitutes resilience training remain topics of considerable debate [52–55]. A recent review of resilience in healthcare workers defined it as ‘the ability to maintain personal and professional well-being in the face of ongoing work stress and adversity’ [56]. (That review did not identify any interventions designed to increase resilience in doctors.) Organisational interventions tend to develop a ‘psychosocial safety climate’ that comprises clearly communicated managerial participation and commitment to, and prioritization of, employee psychological health [57]; enhancement of (procedural and relational) organizational justice [58] and team-based interventions to promote mental resources and resilience [59]. Research is sparse regarding an organizational, integrated systems approach to addressing doctors’ potential stressors [60]. Although person-directed resilience training has been recommended to proactively prepare doctors for ‘inevitable’ stressors [61], a distal-focused approach may be more appropriate [62].

Application of positive psychology
Research on improving GP well-being is limited by focusing mainly on stressors and not giving systematic attention to aspects of well-being such as positive affect, engagement and optimism. The application of interventions to promote flourishing - so-called positive psychology interventions (PPIs) - in occupational groups is under-researched.

The (only) systematic review of PPIs in organizations found that 13/15 had positive effects across 29 measures of well-being including positive emotions, optimism, resilience and life satisfaction (though most investigated an individual-level outcome) [63] The only primary care-based study in this review used appreciative inquiry - a largely qualitative method of organisational change management and quality improvement [64]. They found some evidence of well-being improvement in the GPs as they developed a shared sense of purpose and increased engagement with the organisational change intervention through the implementation of change objectives. Time shortage among GPs was cited as a possible explanation for the limited success of the intervention. Appreciative inquiry may prove to be effective in the development of future GP well-being interventions.

Shifting from the deficit approach that underpins stress response amelioration towards a more proactive mental health promotion approach that empowers and enhances work and personal resources may prove to be more effective in and appropriate to our population of interest [65, 66].

Limitations and strengths
This review is limited by an English language restriction applied at protocol stage to address potential heterogeneity in well-being terminology and constructs. However, it was conducted using robust methodology and identified a substantial research gap. It is the first review to evaluate an extensive body of research pertinent to the optimisation of well-being in GPs.

Conclusion
The evidence base in this area is limited. There is a clear need for pragmatic randomised controlled trials using validated assessments of the positive construct of well-being to identify strategies that will help safe-guard the mental health of doctors working in primary care.

Additional files

Additional file 1: Full Table of Excluded Studies. (DOCX 18 kb)
Additional file 2: PRISMA Flow Diagram. (DOCX 19 kb)

Abbreviations
GP: general practitioner; PPI: positive psychology interventions; CPD: continuous professional development.

Competing interests
The authors declare that they have no competing interests.
Authors’ contributions

MM conceived of the study, participated in its design, data collection, analysis and interpretation and helped draft the manuscript. LM participated in study design, data collection analysis and interpretation. MD participated in study design, data analysis and interpretation and helped draft the manuscript. All authors read and approved the final manuscript.

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Author details

1School of Medicine, Dentistry and Biomedical Sciences, Centre for Public Health, Queen’s University Belfast, Institute of Clinical Sciences, Block B, Royal Victoria Hospital, Belfast BT1 26A, UK. 2School of Public Health, Health Education North West, Regatta Place, Summers Road, Liverpool L3 4BL, UK. 3UKCRC Centre of Excellence for Public Health (Northern Ireland), Institute of Clinical Sciences, Royal Victoria Hospital, Belfast BT1 26A, UK.

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