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Association of GP wellbeing and burnout with patient safety in UK primary care:

a cross-sectional survey

Abstract

Background
GPs have particularly high levels of burnout and poor wellbeing. Although both are associated with poorer safety outcomes within secondary care, there have been no quantitative studies investigating this within primary care. Furthermore, little is known about how occupational demands, burnout and wellbeing, and patient safety are all associated.

Aim
To investigate whether occupational variables (demands and support) are associated with patient safety outcomes in general practice through their influence on GP burnout and wellbeing.

Design and setting
Cross-sectional survey in the UK between March 2016 and August 2017.

Method
A total of 232 practising GPs completed an online or paper survey measuring burnout, wellbeing, occupational demands and support, and patient safety.

Results
In all, 93.8% of GPs were classed as likely to be suffering from a minor psychiatric disorder, 94.7% as suffering from mild (22.0%) or severe (72.7%) exhaustion, and 86.8% as having mild (37.9%) or severe (48.9%) disengagement. Structural equation modelling (SEM) analyses showed that spending a higher number of hours on administrative tasks and on call, and feeling less supported in their practice, was associated with lower wellbeing, which in turn was associated with a higher likelihood of having reported a near miss in the previous 3 months. A higher number of hours spent on administrative tasks, a higher number of patients seen per day, and feeling less supported were associated with higher burnout levels, which in turn was associated with worse perceptions of safety.

Conclusion
To improve patient safety within general practice changes could be made at both practice and individual levels to promote a healthier work environment for staff and patients.

Keywords
burnout; general practice; general practitioners; patient safety; professional; support; wellbeing.

INTRODUCTION

GPs have high rates of burnout and poor mental wellbeing compared with the general population and other healthcare professionals.[1–11] In the UK, GPs are experiencing the highest stress levels since 1998;[12] there is an alarming workforce shortage and large numbers are considering leaving the profession.[12,13]

In general, burnout and poor wellbeing in healthcare professionals is associated with poorer patient safety outcomes, such as increased risk of adverse events and near misses,[14–16] but this area is under researched within primary care. Given the high levels of burnout and frequency of patient safety incidents within this setting, this research is imperative: up to 2% of GP consultations result in patient safety incidents,[17] and 12% of patients are subject to prescription errors.[18] Despite a lack of quantitative research, recent qualitative studies indicate that GPs perceive that burnout and poor wellbeing negatively impacts their ability to deliver safe care.[19]

Various occupational factors contribute to GP burnout and wellbeing, including increased paperwork and patient demands, and lack of support.[20,21] Occupational demands are also associated with safety outcomes within secondary care. However, less is known about how occupational demands, burnout and wellbeing, and patient safety are all associated. One study of nurses suggests burnout mediates the association between occupational variables and patient safety outcomes.[22]

The current study therefore aimed to investigate whether occupational variables related to demands and support are associated with patient safety outcomes in general practice, through their influence on GP burnout and wellbeing. It had four main aims, to determine whether:

- occupational characteristics are associated with burnout and wellbeing in GPs;
- GP burnout and wellbeing are associated with patient safety;
- occupational characteristics are associated with patient safety; and
- GP burnout and wellbeing mediate any associations between occupational characteristics and patient safety.

METHOD

Design

A cross-sectional survey design was used, undertaken between March 2016 and August 2017.

Participants and recruitment strategy

Currently practising UK GPs were eligible. Participants were recruited for an online version of the questionnaire either via a previous study, Twitter, GP media outlets, GP-related professional bodies (British Medical Association [BMA]), or practice managers. Paper questionnaires were posted

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How this fits in

Despite research demonstrating the association between healthcare professionals' levels of burnout and wellbeing with patient safety outcomes in secondary care, research within primary care is lacking. This study is the first to establish the association between these variables in general practice. Occupational demands and support were found to be associated with patient safety (outcomes and perceptions) through their impact on GPs' levels of burnout and wellbeing. Changes at both practice and individual levels could be made to provide a healthier work environment for staff and safer care for patients.

to a random selection of GPs from a publicly available nationwide database (egpcur), with pre-paid return envelopes.

Measures

Demographics (age, sex, ethnicity, and years working as a GP) and measures of occupational characteristics, burnout, wellbeing, and patient safety were collected.

Occupational characteristics

Work demands characteristics were measured (Table 1). Additionally, participants rated how supported they felt within their workplace on an 11-point analogue scale from 0 ('not at all supported') to 10 ('very supported').

Burnout

The 16-item Oldenburg burnout inventory (OLBI) measured burnout on two subscales (exhaustion and disengagement).[23,24] Scores on each scale were categorised into: 'no exhaustion/disengagement', (0–17.59), 'mild exhaustion/disengagement' (17.60–21.99), and 'severe exhaustion/disengagement' (22–32).[25,26]

Wellbeing

The 12-item general health questionnaire (GHQ-12) measured general wellbeing.[27] Higher scores indicated poorer mental wellbeing; scores >3 were categorised as a possible case of minor psychiatric illness.[28] A quality of life linear analogue scale measured general wellbeing.[29,30] Participants indicated how satisfied they currently were with their life overall from 0 ('as bad as it could be') to 10 ('as good as it could be').

Patient safety

Adverse events and near misses. Participants reported whether they had been responsible for any adverse events (AEs) or near misses (NMs) in the previous 3 months ('yes' or 'no' for each question).[31–35] If 'yes' for either, they were asked to classify the outcome, type, and contributing factor of the AE/NM.[34,36–39]

Safe practitioner. The 'safe practitioner' measure was used. Participants rated the extent they felt they delivered a safe practice in general, dependent on work-related conditions.[40,41]

Data analysis and preparation. Responses were screened for outliers and eligibility. Two cases were removed due to ineligibility, three due to large amounts of missing data (>20%), and one outlier was edited in line with recommended guidelines.[42] The remaining data ($n = 227$) contained some missing data points, but these data points were missing completely at random ($\chi^2 = 616.609$, degrees of freedom [df] 611, $P = 0.429$).[43] Each variable did not exceed more than 6% missing data.

For SPSS-22 analyses, missing data were imputed using multiple imputation (five iterations). For analyses in AMOS-22, the inbuilt regression imputation method was used. Descriptive statistics and bivariate correlations were conducted in SPSS-22.

For aims 1–3, regressions models were tested in STATA, allowing pooling of regression outputs using the imputed datasets.[44] For aim 4, structural equation models (SEM) were built and tested in AMOS so that bootstrapping could be applied and measurement errors controlled for. In all, 5000 bootstrap samples with a 95% bias-corrected confidence interval were used. The following criteria were selected for assessing model fit:[45,46] χ^2 $P>0.05$, comparative fit index (CFI) $P>0.95$, root mean square error of approximation (RMSEA) $P<0.07$.

However, the significance of the χ^2 statistic should be interpreted with caution, as it is often significant with samples >200 and when the model contains large correlations.[46] For all regression models and SEM analyses, age, sex, and years working as a GP were controlled for. Regressions in STATA were conducted both with and without these control variables, and R^2 change was calculated. Outputs for the regressions inclusive of control variables are reported.

RESULTS

Participants

In all, 232 GPs participated. Around 20 GPs were recruited following participation in a previous study or from Twitter. The majority (n, 180) were recruited via the BMA, who provided a link to the survey on their online GP forum and emailed this to their

subscribers. Remaining participants were recruited through postal surveys and by emailing practice managers.

Descriptive statistics

Descriptive statistics prior to missing data imputation are reported in Table 1. Pearson's, Spearman's, and point-biserial correlations, are available from the authors on request. Job role responses were recoded into a dichotomous variable to allow comparison between partners versus all other roles.

A total of 94.7% of participants were classed as having mild (22.0%) or severe (72.7%) exhaustion, and 86.8% as having mild (37.9%) or severe (48.9%) disengagement. In all, 93.8% of participants were classed as likely to be suffering from a minor psychiatric disorder.

Almost half of all participants (44.1%) reported a near miss in the previous 3 months, and one-sixth (15.9%) reported an adverse event. Medication or prescription AE/NM were the most common, followed by communication AE/NM. The majority of AEs and NMs resulted in (or had the potential to result in) minor reversible harm. One AE resulted in major irreversible harm, and six NMs had the potential to result in major irreversible harm. The most commonly cited contributors were GP's fatigue, concentration lapse, and burnout (further information available from the authors on request).

Aims 1–3

Multiple and logistic regressions were conducted to address aims 1–3. Model statistics (including significant predictor variables) are reported in Tables 2 and 3. Occupational variables explained a significant amount of variance in burnout, wellbeing, and safe practitioner scores. Hours on call and GHQ scores explained a significant amount of variance in near misses. Burnout (specifically exhaustion) explained a significant amount of variance in safe practitioner scores.

Aim 4: Modelling all variables

Three SEMs were tested using AMOS to determine whether wellbeing and burnout mediated the association between occupational variables and patient safety

Table 1. Descriptive statistics

Variable	*N*[a]	Mean (SD)	Range	Frequencies, *n* (%)
Age[a]	223	47.86 (10.691)	27–66	
Sex	227			Female, *n* = 135 (59.5), male, *n* = 89 (39.2), undisclosed, *n* = 3, (1.3)
Years in practice	227	17.97 (9.841)	0–55	
Job role	227			Partner, *n* = 157 (69.2), locum, *n* = 12 (5.3), salaried, *n* = 41 (18.1), other, *n* = 13 (for example, in training) (5.7), undisclosed, *n* = 4, (1.8)
Practice location	227			Urban, *n* = 81, (35.7), suburban, *n* = 97 (42.7), rural, *n* = 36 (15.9), mixed, *n* = 13 (5.7)
Patient contact hours per week	227	23.278 (10.09)	0–50	
Patients seen per day	222	32.77 (7.963)	9–51	
Extra roles per week[a]	214	4.322 (6.524)	0–35	
Admin hours per week	227	11.850 (7.579)	0–36	
Antisocial hours per week	227	9.22 (6.153)	0–36	
On call per month[a]	214	21.63 (28.339)	0–160	
Supportive practice	227	6.33 (2.575)	0–10	
Safe practice	227	2.26 (1.188)	0–4	
Quality of life	227	5.80 (2.02)	0–10	
GHQ-12[a]	223	7.91 (2.605)	0–12	Possible case, *n* = 209, (93.72), no case, *n* = 14, (6.28)
OLBI: E[a]	222	23.98 (3.952)	13–32	None, *n* =12, (5.41), mild, *n* = 48, (21.62), severe, *n* = 162, (72.97)
OLBI: D[a]	224	21.48 (3.582)	13–32	None, *n* = 29 (12.95), mild, *n* = 84 (37.50), severe, *n* = 111 (49.55)
OLBI:[a] total score	220	45.47 (6.729)	28–64	
Adverse events	227			≥1, *n* = 36 (15.9), 0, *n* = 190 (83.7), missing data, *n* = 1 (0.4)
Near miss	227			≥1, *n* = 100 (44.1), 0, *n* =127 (55.9)

[a]Figures reported in Table 1 are prior to missing data being imputed, whereas the reported figures in the text are after missing data was imputed, which is why they are slightly different. GHQ = general health questionnaire. OLBI = Oldenburg burnout inventory. OLBI: D = Oldenburg burnout inventory: disengagement. OLBI: E = Oldenburg burnout inventory: exhaustion. SD = standard deviation.

Table 2. Regression outputs for burnout, wellbeing, and patient safety outcome variables (aims 1 and 3)

	Model F statistic	Model *P*-value	Model R^2 (mean)	Job role	Practice list size	Antisocial hours	Admin hours	Extra roles	On call	Patients per day	Patient contact hours	Supportive practice
Safe practitioner	**1.90**	**0.035**	**0.101**	–0.047	–0.100	–0.149	**0.323**[a]	0.095	–0.010	0.028	–0.005	–0.003
PSI	1.14	0.318	n/a	1.131	1.000	0.987	0.973	0.961	**0.987**[b]	0.996	1.01	1.039
Adverse event[d]	0.61	0.837	n/a	1.154	1.000	0.953	0.990	0.990	0.997	0.998	0.996	1.048
Near miss[d]	1.36	0.179	n/a	1.060	1.000	0.984	0.976	0.959	**0.983**[c]	1.015	1.008	1.072
OLBI	**7.90**	**<0.001**	**0.313**	–0.113	0.077	–0.000	**0.205**[c]	0.092	–0.100	**0.132**[b]	0.027	**–0.413**[a]
OLBI: D	**6.60**	**<0.001**	**0.275**	–0.126	0.028	–0.069	**0.165**[b]	0.066	–0.105	**0.154**[b]	0.046	**–0.396**[a]
OLBI: E	**5.77**	**<0.001**	**0.249**	–0.078	0.106	0.063	**0.200**[c]	0.097	–0.075	0.085	0.004	**–0.346**[a]
GHQ-12	**5.87**	**<0.001**	**0.252**	–0.129	0.026	–0.049	**0.233**[c]	0.077	0.067	0.026	0.120	**–0.301**[a]
QoL	**9.20**	**<0.001**	**0.345**	–0.001	0.026	0.026	**–0.227**[c]	**–0.210**[a]	0.033	**–0.137**[b]	**–0.237**[a]	**0.339**[a]

Variables listed vertically indicate model outcome variables. Variables listed horizontally indicate predictor variables. Bold font indicates significant models and variables. [a]*Variable made a significant independent contribution to the model at P<0.001.* [b]*Variable made a significant independent contribution to the model at P<0.05.* [c]*Variable made a significant independent contribution to the model at P<0.01.* [d]*Logistic regression. GHQ = general health questionnaire. n/a = not applicable. OLBI = Oldenburg burnout inventory. OLBI: D = Oldenburg burnout inventory: disengagement. OLBI: E = Oldenburg burnout inventory: exhaustion. PSI = patient safety incident. QoL = quality of life. All regressions controlled for age, sex, and years in practice. Statistics represent mean standardised β coefficients for linear regressions, odds ratios for logistic regressions.*

outcomes. The occupational variables chosen for inclusion in each model were based on their significance in the previous regression models. If an occupational variable made a significant, independent contribution to either of the models with a wellbeing/burnout outcome variable or the models with a patient safety outcome variable, it was included in the relevant SEM (Table 2). Age, sex, and years working as a GP were controlled for in all models. No model was tested using AEs as the outcome, due to a lack of significant associations in the previous regressions.

Model 1: Wellbeing and near misses

This model tested whether administrative hours, supportive practice, and on call were indirectly associated with near misses, with wellbeing mediating the association (Figure 1). The model was a good fit when the covariance between administrative hours and on call was controlled for (χ^2 (11) = 16.930, P = 0.110, CFI = 0.984, RMSEA = 0.049, 95% confidence intervals [CI] = 0.000 to 0.092). This model suggests that working in less supportive practices and spending a high number of hours on administrative work were associated with poorer wellbeing, which in turn was associated with a higher likelihood of being involved in a near miss.

Model 2: Burnout and safe practitioner

The second model tested whether administrative hours, supportive practice,

Table 3. Regression outputs indicating whether burnout and wellbeing variables explain safety outcomes (aim 2)

	Model F statistic	Model *P*-value	Model R^2 (mean)	OLBI	OLBI: D	OLBI: E	GHQ-12	QoL
Safe practitioner[a]	**3.58**	**0.002**	0.091	**0.267**[c]	–	–	0.019	–0.014
Safe practitioner[b]	**5.02**	**<0.001**	0.105	–	0.015	**0.300**[d]	–	–
PSI[e]	1.33	0.242	n/a	1.012	–	–	0.881	1.078
Adverse event[e]	0.79	0.576	n/a	0.980	–	–	0.940	1.063
Near miss[e]	1.44	0.196	n/a	1.021	–	–	**0.856**[f]	1.070

Variables listed vertically indicate model outcome variables. Variables listed horizontally indicate predictor variables. Bold font indicates significant models and variables. [a]*Model included only total OLBI score and not scores from the two separate scales.* [b]*Model included disengagement scores and exhaustion scores, but not total OLBI score.* [c]*Variable made a significant independent contribution to the model at P<0.01.* [d]*Variable made a significant independent contribution to the model at P<0.001.* [e]*Logistic regression.* [f]*Variable made a significant independent contribution to the model at P<0.05. All regressions controlled for age, sex, and years in practice. Statistics represent mean standardised β coefficients for linear regressions, odds ratios for logistic regressions. GHQ = general health questionnaire. n/a = not applicable. OLBI = Oldenburg burnout inventory. OLBI: D = Oldenburg burnout inventory: disengagement. OLBI: E = Oldenburg burnout inventory: exhaustion. PSI = patient safety incident. QoL = quality of life.*

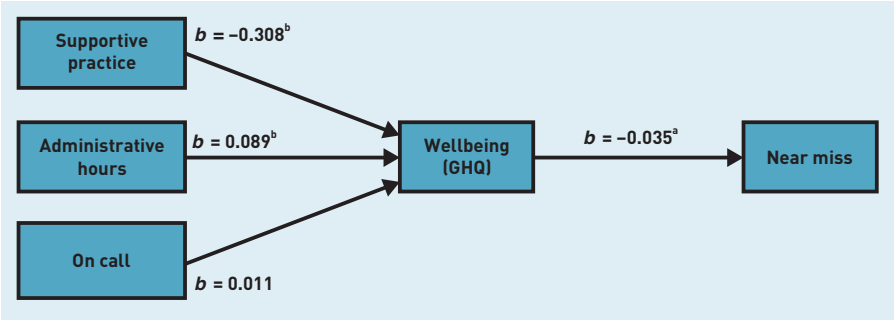

Figure 1. Occupational variables, wellbeing, and near misses. b = unstandardised beta. [a]P<0.01. [b]P<0.001. GHQ = general health questionnaire.

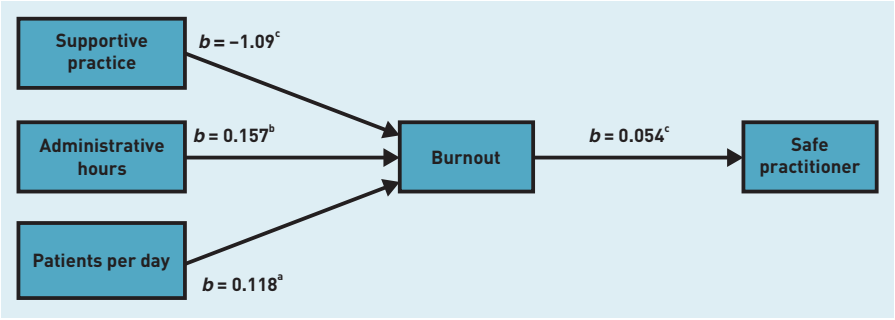

Figure 2. Occupational variables, burnout, and safe practitioner. b = unstandardised beta. [a]P<0.05. [b]P<0.01. [c]P<0.001.

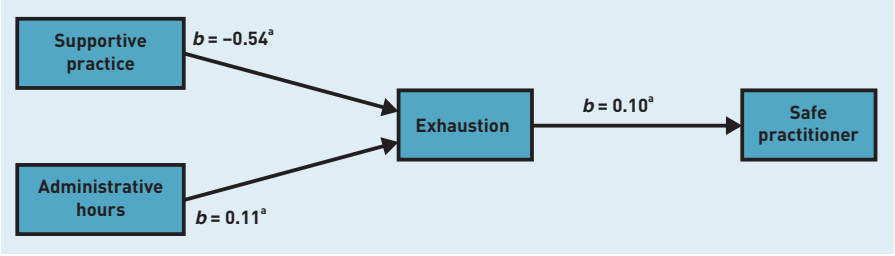

Figure 3. Occupational variables, exhaustion, and safe practitioner. b = unstandardised beta. [a]P<0.001.

and patients seen per day were indirectly associated with safe practitioner scores, with burnout mediating the association. (Figure 2). Despite a significant χ^2, this model was still an adequate fit according to other fit indices, when the covariance between administrative hours and patients seen per day was controlled for (χ^2 (11) = 21.001, *P* = 0.033, CFI = 0.976, RMSEA = 0.063, 95% CI = 0.017 to 0.104). This model suggests a less supportive practice, a high number of hours spent on administrative work, and a higher number of patients seen per day were associated with higher burnout levels, which in turn was associated with lower perceptions of safety.

Model 3: Exhaustion and safe practitioner

The final model tested whether administrative hours and supportive practice were indirectly associated with safe practitioner scores, with exhaustion mediating the association. (Figure 3). This model was found to be of adequate fit according to most of the fit indices (χ^2 (9) = 17.748, *P* = 0.038, CFI = 0.977, RMSEA = 0.066, 95% CI = 0.015 to 0.110). This model suggests that a higher number of hours spent on administrative work and a less supportive practice were associated with exhaustion, which in turn was associated with lower safety perceptions.

DISCUSSION

Summary

An alarmingly high number of GPs in this sample reported mild to severe levels of burnout, and high scores on the GHQ-12, indicating possible cases of minor psychiatric illness. SEM models demonstrated that specific occupational variables were associated with patient safety outcomes, through their influence on wellbeing and burnout. Specifically, spending a higher number of hours on administrative tasks and on call, and feeling less supported, was associated with lower wellbeing, which in turn was associated with a higher likelihood of reporting a near miss in the previous 3 months.

Additionally, a higher number of hours spent on administrative tasks, a higher number of patients seen per day, and feeling less supported was associated with higher burnout levels, which in turn was associated with worse perceptions of safety. Furthermore, a higher number of hours spent on administrative tasks and not feeling well-supported was associated with greater feelings of exhaustion (a burnout subfacet), which in turn was associated with worse perceptions of safety.

All models found that hours spent on administrative tasks and the amount of support in the practice were significantly indirectly associated with patient safety (outcomes and perceptions), indicating that these two occupational variables are perhaps the most important when it comes to GPs' wellbeing, burnout levels, and patient safety.

To improve patient safety within general practices, changes could be made at both the practice level and the individual level to promote a healthier work environment for staff and patients.

Strengths and limitations

This is the first quantitative study demonstrating associations between occupational characteristics, burnout, wellbeing, and patient safety within GPs. Previous literature discussing these links in this setting has solely been qualitative.[19,21,47] Another strength is the use of wellbeing and burnout measures simultaneously within

analyses. The importance of measuring both has previously been highlighted.[14]

This study had a relatively small sample size, due to recruitment difficulties. The cross-sectional design limits the ability to determine cause and effect. It is possible that more hours spent on administrative work does not *cause* burnout, but that burnt out GPs are struggling to cope with the workload and therefore take longer to complete paperwork than those who are not struggling. For a true test of the mediating role of burnout and wellbeing, occupational variables, burnout and wellbeing, and safety should be assessed over time. Although the current study cannot comment on the direction of these relationships, establishing that these variables are associated is a necessary first step, before future research can establish the direction.

Finally, participants were self-selecting, with the majority belonging to the trade union for doctors in the UK (the BMA), which causes potential for a biased sample and therefore has implications for the generalisability of the results. In particular, the self-selecting nature of the sample may partially explain the exceedingly high proportion of participants reporting high levels of burnout and mental distress. Although previous surveys also reported fairly high rates of GP burnout and mental illness,[6,7] it may be worth investigating whether more conservative screening tools are needed in this population, or whether these high rates indicate a serious and pervasive mental health concern for current and future GPs.

Comparison with existing literature

These results are consistent with literature regarding secondary care doctors that suggests that poorer wellbeing and burnout are associated with patient safety measures.[14–16] They also provide quantitative support for previous qualitative findings by Hall *et al* within general practice.[19]

The variables found to be commonly associated with all of the burnout and wellbeing measures were the number of hours spent on administrative work per week, and the level of support within the practice. These findings support previous studies based on the job demands control and job demands resources theories of burnout. These theories posit that work environments with high demands (for example, heavy workloads, long hours, and high pressure) and low levels of either job control (use of skills and autonomy at work) or job resources (for example, peer and managerial support, or physical resources) are conducive to employee stress, ill-health, and burnout.[26,48]

These findings also support previous qualitative research reporting that GPs have stated a need for a reduction in administrative work, or for more administrative support staff.[21,47] Paperwork was the fourth biggest stressor in a UK GP survey in 2015,[12] and has historically been a major stressor for GPs.[49] Furthermore, it is well acknowledged that levels of support are important to staff wellbeing and burnout levels across all sectors, including health care.[50–52]

Fostering a more positive and supportive team culture through formal (for example, mentoring systems) or informal (for example, communal breaks) ways should be a serious consideration among practice staff and healthcare organisation managers.

These findings support previous research within secondary care among Canadian nurses that reported that work environments (including support) were associated with adverse events through the key mediating role of burnout.[22]

The current study adds to this, and shows that it is the level of support and the amount of administrative work in particular that impact on burnout and wellbeing, and subsequently lead to changes in safety.

Implications for research and practice

These findings suggest two places that interventions could target. One is at system or practice level by addressing the occupational characteristics; that is, reducing administrative work, hiring more administrative staff, providing a more supportive environment. The second is at an individual level; for example, through resilience training. Both have advantages and disadvantages. It is likely that a dual approach is needed to successfully reduce burnout, improve wellbeing, and also reduce patient safety incidents.

Cost-effectiveness evaluations of the relative approaches are warranted to help identify the most feasible solutions. It is likely to be more cost-effective to intervene on these issues than not to; the Boorman Report estimates that improving staff health and wellbeing in primary care could save £213 806 annually per trust.[53]

Future research should take a longitudinal approach to understand temporal relationships between these variables, within a larger sample of GPs. This will clarify whether burnout and poor wellbeing lead to poorer patient safety, whether the reverse is true, or whether it is a vicious circle.

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Ethical approval

This study received ethical approval from the University of Leeds, School of Psychology Ethics Committee (ref #16-0191 accepted on 19/07/2016) and the Health Research Authority (IRAS ref #207249).

Provenance

Freely submitted; externally peer reviewed.

Competing interests

The authors have declared no competing interests.

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