Psychosocial work characteristics, burnout, psychological morbidity symptoms and early retirement intentions: a cross-sectional study of NHS consultants in the UK

Atir Khan,1 Kevin RH Teoh,2 Saiful Islam,3 Juliet Hassard4

ABSTRACT

Objectives The objectives of this study are twofold. First, to examine the direct effect of psychosocial work characteristics (as measured by job autonomy and workload pressure) in relation to self-reported psychological morbidity symptoms and early retirement intentions among a sample of hospital consultants in the National Health Service (NHS). Second, to investigate burnout as a mediating variable (ie, indirect effect) of these postulated associations.

Design A cross-sectional observational study.

Participants 593 NHS consultants (male=63.1%) from hospitals in England, Scotland and Wales.

Measures Self-reported online questionnaires on work-related pressure and job autonomy (Job Demands-Resources Questionnaire); emotional exhaustion and depersonalisation (Maslach Burnout Inventory); depressive and anxiety symptoms (State Trait Personality Inventory) and a single-item on early retirement intention.

Results This study observed high prevalence rates across all adverse health measures: emotional exhaustion (38.7%), depersonalisation (20.7%), anxiety symptoms (43.1%) and depressive symptoms (36.1%). Multiple linear regressions examined the postulated direct and indirect effects. Job autonomy had significant negative direct effects on the frequency of NHS consultants’ anxiety and depressive symptoms, and their intention to retire early. Both emotional exhaustion and depersonalisation mediated the relationships that work-related pressure (full mediation) and job autonomy (partial mediation) had with self-reported symptoms of psychological morbidities. Only emotional exhaustion mediated the relationships where early retirement intention was the outcome. In terms of sociodemographic factors, age and years’ experience predicted both burnout dimensions and psychological morbidity symptoms, but did not mediate the relationships between job autonomy and burnout dimensions.

Conclusions This is the first study to demonstrate the mediating role of burnout between psychosocial work characteristics of National Health Service (NHS) consultants and their reported depressive and anxiety symptoms and intentions to seek early retirement.

Strengths and limitations of this study

► This is the first study to demonstrate the mediating role of burnout between psychosocial work characteristics of National Health Service (NHS) consultants and their reported depressive and anxiety symptoms and intentions to seek early retirement.
► Mediations were examined using Hayes’ PROCESS Model 4 macro with bootstrapping, which generates more accurate Confidence Intervals than other commonly used mediation methods.
► This is a cross-sectional study design. As such, any interpretation of causality is not appropriate, as it is plausible that the relationship between the variables measured are reciprocal in nature.
► All study variables were drawn from self-report data of the individual consultant, making it vulnerable to common method bias.
► We were not able determine the response rate as we are unaware as to how many NHS trusts and health boards who agreed to participate actually followed through and sent the survey link to their consultants.

INTRODUCTION

The National Health Service (NHS) is one of the world’s largest employers, with 1.3 million staff in England and Wales caring for an estimated 243 million patients annually. For this system to continue to provide safe, sustainable and patient-centred care, the well-being and retention of its workforce are critical considerations. The NHS performs comparatively worse across many measures of staff well-being; with sickness absence rates, on average, 27% higher than the UK public sector and 46% higher across all sectors. Understanding the nature and impact of psychosocial working conditions on medical...
professionals’ work-related well-being is, we believe, of clear empirical importance. In addition, its practical value in the development of evidenced-based workplace preventative solutions cannot be understated.

**Psychosocial work characteristics and work-related well-being**

Exposure to poor psychosocial work characteristics (eg, poor job autonomy, work-related pressures, injustice at work, insufficient leadership) have been linked to a myriad of work-related well-being (inclusive of physical, psychological, behavioural and attitudinal) outcomes, including, for example, poor mental health\(^1\)\(^2\)\(^3\)\(^4\); increased health impairing behaviours (eg, increased smoking\(^7\); alcohol consumption\(^6\)); poor physical health (eg, coronary heart disease\(^7\); \(^8\)); reduced job satisfaction\(^9\); intention to quit\(^10\) and diminished organisational commitment.\(^11\)

In short, there is strong research to suggest that exposure to poor psychosocial work characteristics poses a clear risk to employees’ health and work engagement. However, the nature and mechanisms underpinning such associations must be examined and understood at various levels (eg, community, sectoral and organisational), and within various vocational groups and occupational roles.\(^12\)

Within the healthcare sector, much of the available research has focused on a limited number of occupational groups (eg, nurses\(^13\)\(^14\); social workers\(^15\)\(^16\) and, to a lesser degree, doctors\(^17\)\(^18\)). The importance of focusing on different occupational groups is evident in a study of German intensive care units, where nurses, junior physicians and senior physicians reported different levels of burnout, turnover intention and perceived non-beneficial patient treatment.\(^19\)

While the extant literature examining doctors specifically is increasing, there has (to date) been little attempt to examine the nature of this association within a unique vocational subgroup: NHS hospital consultants. These doctors are among the most experienced and trained within this vocational group.\(^20\) Their role as educators and supervisors of the next generation of doctors and nurses means their organisational contribution in the development of the current and future workforce is imperative.\(^21\)

**The mediating role of burnout**

Burnout is one of the most commonly studied well-being constructs within the healthcare sector;\(^22\) and, in particular, as a measure of work-related well-being among doctors. Burnout refers to a prolonged psychological response to chronic emotional and interpersonal stresses related to work,\(^23\)\(^24\) and manifests through symptoms of emotional exhaustion, depersonalisation and reduced personal accomplishment. Emotional exhaustion denotes being emotionally overextended and exhausted by work. Depersonalisation refers to an impersonal feeling towards people, and reduced personal accomplishment encompasses the reduced work effectiveness due to emotional exhaustion and depersonalisation. Studies\(^22\)\(^25\)\(^26\) have found strong and consistent support for the emotional exhaustion and depersonalisation dimensional factors of burnout; and are, therefore, typically viewed as its core conceptual components. However, the evidence surrounding professional accomplishment is comparatively mixed. Consequently, personal accomplishment is generally viewed as a separate, but related entity.\(^25\)

Evidence derived from reviews and meta-analyses demonstrate a significant association between poor psychosocial working conditions and doctors’ self-reported burnout symptoms.\(^17\)\(^18\) Within the extant literature, burnout has predominantly been conceptualised and investigated as the outcome of a poor psychosocial work environment. However, there is increasing attention being paid to the potential role of burnout as an antecedent to a range of health-related, attitudinal and behavioural outcomes, including: depression and anxiety;\(^27\) substance abuse;\(^28\) work performance;\(^29\) turnover intention\(^30\) and patient care.\(^31\) This is not surprising, as burnout depletes workers’ energy and coping resources, which may results in increased physiological and psychological strain.\(^32\)

This may, in turn, trigger and exacerbate symptoms of psychological morbidity and work disengagement; and, consequently in the long term, interfere with performance.\(^33\) The role of burnout has also been examined in relation to turnover intention, notably where healthcare workers’ working conditions\(^34\) and perceived non-beneficial patient treatment\(^19\) were predictors. Focusing specifically on doctors, to date limited research has sought to examine burnout as a possible mediating variable in relation to doctors’ perceived working condition and their psychological health and experienced work-related attitudes. This study aims to address this gap in knowledge.

**Study aims**

The objectives of this study are twofold. First, to examine the direct effect of psychosocial work characteristics (job autonomy and work-related pressure) in relation to self-reported psychological morbidity symptoms and early retirement intentions among a sample of hospital consultants in the NHS. Second, to investigate burnout as a mediating variable (ie, indirect effect) of this postulated association. Figure 1 provides a visual representation of the study’s postulated direct and indirect effects among independent and dependent variables.

**METHOD**

**Study design and sample**

A cross-sectional quantitative survey was carried out between November and December 2015. The Human Resources departments of all the Health Boards in Wales (n=7) and Scotland (n=10) were approached to participate in this study, along with 12 NHS Trusts from England. All agreed to forward an electronic survey, administered through Bristol Online Survey, to all their consultants. It is not possible to determine how many consultants actually received the survey. We used the response from a sample size of 500 consultants. This is based on a sample
size calculation using survey sample method that consid-
ered a total consultant population of 10000 across these
Health Board and Trusts (assuming a proportion of 50%,
a 95% CI and allowing 5% margin of error). The calcu-
lation yielded a required sample of 370 responses. This
was increased to a larger sample of 500 to obtain better
representation of the overall population.

Measures
Surveyed consultants provided information on sociode-
mographic details (age, gender, specialty, country, tenure
as consultant), work-related pressure, job autonomy,
burnout, early retirement intention and anxiety and
depressive symptoms.

Psychosocial work characteristics
Two specific psychosocial work characteristics were exam-
ined by the current study: job autonomy and work-rela-
ted pressure. The decision to examine only two (out of
myriad of possible psychosocial work characteristic) was
based on what the contemporary literature repeatedly
highlights as particularly salient work characteristics to
NHS consultants. The English version of the Job Demands-Resources Question-
naire was used to assess work-related pressure and job
autonomy. Work-related pressure consisted of four items
and job autonomy three items. All items were rated on a
Likert scale: 1 (never) to 5 (very often).

Burnout
The Maslach Burnout Inventory was used to quantify
the two examined dimensions of burnout: emotional
exhaustion (nine items) and depersonalisation (five
items). Items were rated on a seven-point Likert scale (0,
‘never’ to 6, ‘every day’). All subscale items were summed
to create two composite scores. Higher scores are indic-
ative of increased emotional exhaustion or depersonal-
isation. The summed scores on the two used composite
measures were used to stratify the sample into ‘high’ and
‘low’ reference categories, with established norm scores
of health professionals used to inform the categorisation
process. A composite score of 27 or higher on the
emotional exhausted scale and 13 or higher on the deper-
sonalisation scale were used to categorise participants in
the ‘high’ group. The ‘low’ group consisted of those with
a score of 13 or lower for emotional exhaustion, and 5 or
lower for depersonalisation.

Psychological morbidity symptoms
Symptoms of trait depression and anxiety were measured
by the State Trait Personality Inventory. This 80-item
inventory contains eight scales that measures state and
trait-related depression, anxiety, curiosity and anger. Only
the 10-item scales pertaining to trait-related depression
and anxiety were included in this study. The scales are
among the most widely used for anxiety and depression
with strong psychometric properties. The frequency

Figure 1 Postulated direct and indirect effects of job autonomy and work-related pressures.
of each item was rated on a four-point Likert scale (1, ‘almost never’ and 4, ‘almost always’), with high scores representing more frequent experience of anxiety and depressive symptoms. Although neither measure has clinically diagnostic cut-off points, participants in this study with scores higher than the 75th percentile of UK working norm scores were classed as high scoring (≥18 for anxiety; ≥20 for depression).

**Work-related attitudinal outcome: early retirement intention**

Depending on the type of scheme, NHS consultants have the option of retiring at age 60 (1995 section) or 65 years (2008 section). Therefore, early retirement intention was assessed through one Likert-based item commonly used in epidemiological surveys of the working population: "do you think you will be doing this job when you are 60 years old". Anchored from 0 ("I would not even want to be") to 6 ‘yes’.

**Statistical analysis**

Descriptive statistics and study measures’ internal consistency using Cronbach’s α were analysed. Subsequently, bivariate two-tailed parametric correlations were calculated to examine the statistical association between study variables. Three multiple linear regression models were then carried out to examine the direct effects of the study’s predictor variables (job autonomy, work-related pressure, emotional exhaustion and depersonalisation) on the three dependent measures: anxiety and depressive symptoms, and early retirement intention. Two additional multiple linear regressions tested the direct effects that job autonomy and work-related pressure had on emotional exhaustion and depersonalisation. Sociodemographic covariates (age, gender, specialty, country, tenure as consultant) were controlled for. Assumptions underlying multivariate linear regression were assessed by plotting residual errors and standardised residuals. Existence of multicollinearity was checked through variance inflation factors, and Durbin-Watson tests were conducted for correlated residuals. All these diagnostics fell within the acceptable ranges for each multiple linear regression model. SPSS (V.22) was used for data management and statistical analysis. Missing data were examined; with, in general, low levels observed (ie, 1.9% in gender and 0.7% for consultant specialty). Such data were excluded from the analysis due their non-significant size.

Hayes’46 PROCESS Model 4 macro was used to examine the indirect effects that psychosocial work characteristics (ie, job autonomy and work-related pressure) had on consultants’ psychological morbidity and turnover intention. Both emotional exhaustion and depersonalisation were examined as mediators within these relationships. This approach tests the indirect effect of both mediators, using a calculation of 1000 bias-corrected bootstrapped 95% CIs. Bootstrapping estimates model parameters and their SEs by the repeated sampling of the study sample. These do not assume that sampling distributions are normal, which is especially applicable for mediation analyses.47 Therefore, bootstrapping generates more accurate CIs than other more commonly used mediation methods. In total, six sets of analyses were carried out, with one set for each relationship between both predictors (work-related pressure, job autonomy) and the three outcome measures (anxiety symptoms, depressive symptoms, early retirement intention). Consultants’ gender, age, experience, country and specialty were included as covariates. The paper is reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology statement.48

**RESULTS**

In total, 593 responses were completed. A full demographic breakdown is presented in table 1. The sample was relatively evenly split between England (32.5%), Wales (32%) and Scotland (35.4%). The majority of respondents were men (63.1%), and aged between 41–50 years (45.5%) and 51–60 years (31%). In total, eight specialty groups were represented, with the majority of respondents identifying as physicians (28.8%), surgeons (18.2%), anaesthetists (14%) and others (15.7%).

Table 1 provides an overview of the proportion of the sample that were categorised as scoring ‘high’ on the examined study variables. These comparisons are not based on inferential statistics and are only for descriptive purposes. A sizeable proportion of the survey sample reported a high level of depressive and anxiety symptoms. Four out of 10 consultants surveyed reported a high frequency of anxiety symptoms, and over a third of the sample were categorised as having a high degree of depressive symptoms. In relation to burnout, 38.7% of participants reported a high level of emotional exhaustion and 20.74% depersonalisation. The means, SD and internal consistency for all study variables are presented in table 2. All used composite measures demonstrated a satisfactory level of internal consistency. Bivariate two-tailed parametric correlations among the predictor and dependent measures are also provided in the same table.

**Direct effects between psychosocial work characteristics and psychological morbidities**

Fewer relationships involving sociodemographic variables were found. High frequency of anxiety symptoms associated with older consultants (β=0.17, p<0.01), consultants with less experience (β=−0.19, p<0.01) and being male (β=−0.12, p<0.01). Surveyed consultants from Wales had more frequent anxiety symptoms than compared with those sampled from Scotland (β=−0.08, p<0.05). For depressive symptoms, being older (β=0.18, p<0.01) and less experienced (β=−0.18, p<0.01) was associated with more frequent depressive symptoms. In terms of specialty,
obstetrics and gynaecology consultants reported less depressive symptoms ($\beta=-0.08$, p<0.05) than physicians. Surveyed consultants’ intention to seek early retirement was not associated with any of the sociodemographic variables measured.

Table 3 presents the results from the five multiple linear regression analyses. Consultants’ job autonomy negatively predicted the level of consultant’s emotional exhaustion ($\beta=-0.26$, p<0.01) and depersonalisation ($\beta=-0.17$, p<0.01), as well as the frequency of their anxiety ($\beta=-0.10$, p<0.01) and depressive ($\beta=-0.17$, p<0.01) symptoms, and their early retirement intention ($\beta=-0.19$, p<0.01). Work-related pressure only predicted exhaustion ($\beta=0.38$, p<0.01) and depersonalisation...
Indirect effects between psychosocial work characteristics and psychological morbidities

In terms of the burnout dimensions, emotional exhaustion positively predicted the frequency of consultants’ anxiety ($\beta=0.47$, $p<0.01$) and depressive ($\beta=0.54$, $p<0.01$) symptoms, and stated intentions to retire early ($\beta=0.13$, $p<0.05$). Depersonalisation only predicted anxiety ($\beta=0.16$, $p<0.01$) and depressive ($\beta=0.12$, $p<0.01$) symptoms. The association between depersonalisation and early retirement intention was not significant.

Six mediation analyses were carried using Hayes\cite{46} PROCESS macro to examine the mediating role of emotional exhaustion and depersonalisation. Table 4 presents that emotional exhaustion mediated the relationship between job autonomy and all three outcome measures: anxiety ($-0.20$ (95% CI $-0.27$ to $-0.12$)) and depressive symptoms ($-0.24$ (95% CI $-0.33$ to $-0.15$)) and early retirement intention ($0.02$ (95% CI $0.01$ to $0.04$)). Depersonalisation was observed to partially mediate the relationship between job autonomy and anxiety ($-0.05$ (95% CI $-0.09$ to $-0.02$)) and depressive symptoms ($-0.04$ (95% CI $-0.08$ to $-0.01$)). Depersonalisation, however, did not mediate at all the relationship between job autonomy and intentions for early retirement. Comparison of both mediators show that emotional exhaustion was the stronger mediator in relation to anxiety ($-0.15$ (95% CI $-0.23$ to $-0.08$)) and depressive symptoms ($-0.24$ (95% CI $-0.29$ to $-0.11$)), but not for early retirement intention ($0.02$ (95% CI $-0.01$ to $0.04$)).

The mediation analyses did not observe any direct effects between work-related pressure and any other three dependent measures. However, evidence of indirect effects among the study variables was observed via both core burnout dimensions (Table 5). Emotional exhaustion fully mediated the relationship between work-related pressure and the frequency of consultants’ anxiety ($0.25$ (95% CI $0.18$ to $0.33$)) and depressive symptoms ($0.33$ (95% CI $0.25$ to $0.42$)), and stated intentions for early retirement ($0.03$ (95% CI $-0.05$ to $-0.01$)). Depersonalisation fully mediated the association between work-related pressures and anxiety ($0.32$ (95% CI $0.23$ to $0.08$)) and depressive symptoms ($0.30$ (95% CI $0.22$ to $0.39$)) and early retirement intention ($0.03$ (95% CI $-0.05$ to $-0.01$)).

Discussion

A large, and growing, research literature has examined the impact of psychosocial work characteristics in relation to a myriad of work-related well-being measures.\cite{5,7,8,12} This
Table 3  Multiple linear regression analyses—dependant variables: anxiety symptoms, depressive symptoms and early retirement intention

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Emotional exhaustion</th>
<th>Depersonalisation</th>
<th>Anxiety symptoms</th>
<th>Depressive symptoms</th>
<th>Early retirement intention</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>19.74</td>
<td>-0.021</td>
<td>-0.84</td>
<td>2.89</td>
<td></td>
</tr>
<tr>
<td>Job autonomy</td>
<td>-0.99**/0.26 (-1.29 to -0.69)</td>
<td>-0.15**/-0.1 (0.027 to -0.04)</td>
<td>-0.30**/-0.17 (-0.42 to -0.17)</td>
<td>-0.09**/-0.19 (-0.13 to -0.05)</td>
<td></td>
</tr>
<tr>
<td>Work-related pressure</td>
<td>1.19**/0.38 (0.96 to 1.45)</td>
<td>0.22**/0.14 (0.09 to 0.34)</td>
<td>-0.03/0.02 (-0.012 to 0.07)</td>
<td>-0.07/-0.07 (-0.17 to 0.03)</td>
<td>0.01/0.03 (-0.02 to 0.05)</td>
</tr>
<tr>
<td>Emotional exhaustion</td>
<td>0.19**/0.47 (0.16 to 0.23)</td>
<td>0.25**/0.54 (0.21 to 0.29)</td>
<td>0.02**/0.13 (0.01 to 0.03)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depersonalisation</td>
<td>0.14**/0.16 (0.07 to 0.20)</td>
<td>0.11**/0.12 (0.04 to 0.18)</td>
<td>0.01/0.02 (-0.02 to 0.03)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialty</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Pathology or microbiology</td>
<td>6.58**/0.10 (0.33 to 12.06)</td>
<td>-1.19/-0.04 (-3.60 to 1.38)</td>
<td>0.97/0.04 (-0.84 to 2.78)</td>
<td>0.71/0.02 (-1.22 to 2.64)</td>
<td>-0.17/-0.02 (-0.82 to 0.48)</td>
</tr>
<tr>
<td>Surgery</td>
<td>2.00/0.07 (-0.54 to 4.52)</td>
<td>1.84**/0.12 (0.45 to 3.33)</td>
<td>-0.75/-0.06 (-1.72 to 0.22)</td>
<td>-0.53/-0.04 (-1.56 to 0.50)</td>
<td>-0.09/-0.02 (0.43 to 0.27)</td>
</tr>
<tr>
<td>Anaesthesia</td>
<td>-0.03/-0.01 (-2.95 to 2.98)</td>
<td>0.81/0.05 (-0.60 to 2.32)</td>
<td>-0.28/-0.02 (-1.34 to 0.78)</td>
<td>0.28/0.02 (-0.85 to 1.41)</td>
<td>-0.13/-0.03 (-0.51 to 0.25)</td>
</tr>
<tr>
<td>Radiology</td>
<td>-2.72/-0.06 (-5.67 to 0.66)</td>
<td>-1.09/-0.05 (-2.88 to 0.79)</td>
<td>0.66/0.03 (-0.74 to 1.95)</td>
<td>0.46/0.02 (-0.97 to 1.90)</td>
<td>-0.08/-0.01 (-0.56 to 0.41)</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>2.97/0.07 (-0.58 to 0.66)</td>
<td>0.04/0.01 (-1.58 to 1.72)</td>
<td>0.34/0.02 (-0.94 to 1.63)</td>
<td>-0.27/-0.01 (-1.64 to 1.10)</td>
<td>0.27/0.05 (-0.19 to 0.73)</td>
</tr>
<tr>
<td>Obstetrics/gynaecology</td>
<td>-1.68/-0.03 (-6.04 to 3.04)</td>
<td>-0.40/-0.01 (-2.83 to 2.41)</td>
<td>-1.64/-0.07 (-3.31 to 0.03)</td>
<td>-2.01/-0.08 (-3.79 to -0.22)</td>
<td>0.13/0.02 (0.48 to 0.73)</td>
</tr>
<tr>
<td>Other</td>
<td>1.87/-0.03 (-0.54 to 4.80)</td>
<td>0.32/0.02 (-1.14 to 1.73)</td>
<td>-0.62/-0.05 (-1.61 to 0.37)</td>
<td>-0.36/-0.02 (-1.42 to 0.69)</td>
<td>-0.16/-0.04 (-0.52 to 0.20)</td>
</tr>
<tr>
<td>Physician (ref)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Age</td>
<td>-2.11**/-0.14 (-3.95 to -0.27)</td>
<td>-2.00**/-0.28 (-2.97 to -1.01)</td>
<td>0.17**/0.27 (0.08 to 0.26)</td>
<td>0.18**/0.25 (0.08 to 0.27)</td>
<td>-0.03/-0.13 (-0.06 to 0.01)</td>
</tr>
<tr>
<td>Gender (male)</td>
<td>-0.17/-0.07 (-3.70 to 0.01)</td>
<td>0.16/0.01 (-0.84 to 1.17)</td>
<td>-1.17**/-0.12 (-1.87 to -0.47)</td>
<td>-0.02/0.01 (-0.77 to -0.73)</td>
<td>-0.12/-0.04 (-0.37 to 0.14)</td>
</tr>
<tr>
<td>Work experience (years)</td>
<td>0.30**/0.19 (0.08 to 0.50)</td>
<td>0.18**/0.22 (0.07 to 0.28)</td>
<td>-0.19**/-0.29 (0.29 to -0.10)</td>
<td>-0.18**/-0.25 (-0.28 to -0.08)</td>
<td>0.01/0.05 (-0.02 to 0.04)</td>
</tr>
<tr>
<td>Country</td>
<td></td>
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</tr>
<tr>
<td>Wales</td>
<td>-0.64 (-2.69 to 1.52)</td>
<td>0.13/0.03 (-1.18 to 1.03)</td>
<td>-0.82**/-0.08 (-1.59 to -0.04)</td>
<td>-0.69/-0.06 (-1.52 to 0.14)</td>
<td>0.04/0.01 (-0.24 to 0.32)</td>
</tr>
<tr>
<td>England</td>
<td>-0.80 (-2.95 to 1.30)</td>
<td>-0.12/-0.01 (-1.18 to 1.03)</td>
<td>-0.24/-0.02 (-1.03 to 0.56)</td>
<td>-0.01/0.01 (-0.86 to 0.84)</td>
<td>-0.14/-0.04 (-0.42 to 0.15)</td>
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<tr>
<td>Scotland (ref)</td>
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<tr>
<td>F (df)</td>
<td>12.82</td>
<td>3.64</td>
<td>21.94</td>
<td>26.26</td>
<td>3.48</td>
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<tr>
<td>df</td>
<td>14 569</td>
<td>14 568</td>
<td>16 568</td>
<td>16 568</td>
<td>16 561</td>
</tr>
</tbody>
</table>

*P<0.05, **p<0.01.
A hazard–harm relationship is within the general working population strongly evidenced. However, it is important to understand the nature and driving mechanisms of this hazard-harm association within its given vocational and organisational contexts. In consideration of this, the current study examined the nature and underpinning mechanisms of such postulated associations within a unique, and grossly under researched vocational group: NHS hospital-based consultants.

Approximately 40% of this sample were categorised as ‘high’ on emotional exhaustion, depressive symptoms and anxiety symptoms. These figures are higher than those reported by previous studies of NHS consultants, and are similar to equivalent surveys of junior doctors. It is, however, important to note that these comparison figures are drawn from studies that used different sampling approaches, and different measures for depressive and anxiety symptoms, or did not publish the cut-off points used. The latter is important considering that different studies using the same measures have used different cut-off points from each other. These descriptive findings highlight the importance of considering the psychological health of doctors (at various stages of their career) as an imperative occupational health issue that necessitates targeted workplace intervention. This descriptive finding highlights, we believe, the importance of considering consultants as a particularly at-risk occupational group in regard to burnout and symptoms of psychological morbidity.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Outcome</th>
<th>Effect of predictor on mediator (a)</th>
<th>Effect of mediator on outcome (b)</th>
<th>Indirect effect of predictor on outcome (a×b) with 95% CI</th>
<th>Total effect of predictor on outcome (c)</th>
<th>Direct effect of predictor on outcome (c')</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional exhaustion</td>
<td>Anxiety symptoms</td>
<td>−1.04**</td>
<td>0.19**</td>
<td>−0.20 (−0.27 to 0.12)</td>
<td>−0.40**</td>
<td>−0.16**</td>
</tr>
<tr>
<td>Depersonalisation</td>
<td>Anxiety symptoms</td>
<td>−0.34**</td>
<td>0.14**</td>
<td>−0.05 (−0.09 to 0.02)</td>
<td>−0.60**</td>
<td>−0.31**</td>
</tr>
<tr>
<td>Emotional exhaustion</td>
<td>Depressive symptoms</td>
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<td>−0.24 (−0.33 to 0.15)</td>
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<td>−0.31**</td>
</tr>
<tr>
<td>Depersonalisation</td>
<td>Depressive symptoms</td>
<td>−0.34**</td>
<td>0.11**</td>
<td>−0.04 (−0.08 to 0.01)</td>
<td>−0.60**</td>
<td>−0.31**</td>
</tr>
<tr>
<td>Emotional exhaustion</td>
<td>Early retirement intention</td>
<td>−1.03**</td>
<td>−0.02**</td>
<td>0.02 (0.01 to 0.04)</td>
<td>0.11**</td>
<td>0.09**</td>
</tr>
<tr>
<td>Depersonalisation</td>
<td>Early retirement intention</td>
<td>−0.34**</td>
<td>−0.01</td>
<td>0.01 (−0.01 to 0.01)</td>
<td>0.09**</td>
<td>0.09**</td>
</tr>
</tbody>
</table>

Gender, age, experience, country and specialty were included as covariates.

<table>
<thead>
<tr>
<th>Mediator</th>
<th>Outcome</th>
<th>Effect of predictor on mediator (a)</th>
<th>Effect of mediator on outcome (b)</th>
<th>Indirect effect of predictor on outcome (a×b) with 95% CI</th>
<th>Total effect of predictor on outcome (c)</th>
<th>Direct effect of predictor on outcome (c')</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional exhaustion</td>
<td>Anxiety symptoms</td>
<td>1.22**</td>
<td>0.20**</td>
<td>0.25 (0.18 to 0.33)</td>
<td>0.24**</td>
<td>−0.04</td>
</tr>
<tr>
<td>Depersonalisation</td>
<td>Anxiety symptoms</td>
<td>0.23**</td>
<td>0.14**</td>
<td>0.03 (0.01 to 0.06)</td>
<td>0.03 (0.01 to 0.06)</td>
<td></td>
</tr>
<tr>
<td>Emotional exhaustion</td>
<td>Depressive symptoms</td>
<td>1.22**</td>
<td>0.27**</td>
<td>0.33 (0.25 to 0.42)</td>
<td>0.26**</td>
<td>−0.09</td>
</tr>
<tr>
<td>Depersonalisation</td>
<td>Depressive symptoms</td>
<td>0.23**</td>
<td>0.11**</td>
<td>0.03 (0.01 to 0.05)</td>
<td>0.03 (0.01 to 0.05)</td>
<td></td>
</tr>
<tr>
<td>Emotional exhaustion</td>
<td>Early retirement intention</td>
<td>1.24**</td>
<td>−0.02**</td>
<td>−0.03 (−0.05 to 0.01)</td>
<td>−0.04*</td>
<td>−0.01</td>
</tr>
<tr>
<td>Depersonalisation</td>
<td>Early retirement intention</td>
<td>0.23**</td>
<td>−0.01</td>
<td>−0.01 (−0.01 to 0.01)</td>
<td>−0.01</td>
<td>−0.01</td>
</tr>
</tbody>
</table>

Gender, age, experience, country and specialty were included as covariates.

*P<0.05, **p<0.01.
The negative impact of poor job autonomy and work-related pressures has been strongly evidenced in relation to psychological morbidity symptoms and work-related attitudinal outcomes within the general working population.\textsuperscript{3} \textsuperscript{4} \textsuperscript{9} \textsuperscript{10} Like previous findings, poor job autonomy was found to directly predict the increased frequency of depressive and anxiety symptoms among surveyed consultants and increased intentions to seek early retirement. Furthermore, this observed association was partially mediated by reported burnout symptoms. According to the conservation of resources theory (COR),\textsuperscript{54} a depletion of energy and coping resources due to burnout can result in a downward spiral that exacerbates resource loss in other areas, including physiological and psychological resources that may trigger depressive and anxiety symptoms.\textsuperscript{35} Similarly, COR theory postulates that when faced with exhaustion, energy depletion and depersonalisation, doctors experiencing burnout may view leaving the profession as a mechanism in which to protect their remaining resources.\textsuperscript{24} Doctors leaving presents a significant loss of skill, knowledge and experience to the health service.\textsuperscript{35} \textsuperscript{36}

To our knowledge, this is the first study to examine burnout symptoms (ie, emotional exhaustion and depersonalisation) as a potential mediator between psychosocial work characteristics and psychological morbidity symptoms and work-related attitudinal outcomes as perceived by NHS consultants. However more broadly, these empirical findings contribute to a small, although growing, research domain within the wider burnout literature. It provides evidence of burnout’s contributory role to work-related well-being as both an outcome, and an intervening variable. We would speculate that the nature of this association would also, by extension, be predictive of work-related behaviours (eg, leaving the profession) and performance among medical professionals. However, this speculation remains untested but remains an important avenue for future research.

In this study, the surveyed consultants’ reported symptoms of emotional exhaustion and depersonalisation were both observed to fully mediate the relationship between their perceived work-related pressures and reported psychological morbidities. This is consistent with previous studies, using nurses\textsuperscript{34} or mixed occupational groups,\textsuperscript{19} that have found burnout to mediate this relationship where turnover intention was the outcome measures. It is important to highlight that the findings derived from the mediation analysis are based on cross-sectional data. However, it does suggest that while excessive and chronic work-related pressures may not be directly associated with surveyed consultants’ psychological health, instead it appears that the experience of burnout may play an important role facilitating its detrimental impact. However, it is plausible that the relationship between job autonomy, burnout, depressive and anxiety symptoms and work-related stress may be reciprocal in nature. Therefore, such postulations of directionality and causality require further systematic longitudinal investigation.

Despite the mediating role of the burnout dimensions, depersonalisation did not operate as a mediator where early retirement intention was an outcome. This is perhaps not surprising, as depersonalisation is defined as withdrawal from fully engaging with their current role.\textsuperscript{22} Therefore, it may be that some consultants who cope at work through depersonalisation may be less inclined to see early retirement as a method to leave their work environment, evidenced by an absence of this relationship in the analysis above. Nevertheless, the relationship that depersonalisation has with both depressive and anxiety symptoms suggests that this is not a healthy coping mechanism. It is also plausible that the resource and energy draining nature of emotional exhaustion means it is a stronger driver of NHS consultants looking to retire early.

**Practical implications**

Although reviews\textsuperscript{55} \textsuperscript{56} have highlighted that individual-level cognitive, behavioural and mindfulness based interventions can be effective in coping with burnout in the healthcare sector, our findings highlight the value of workplace health interventions targeted at adapting working conditions and proactively managing burnout among the NHS staff. One approach to improve the psychosocial work environment is job crafting which has been found to improve medical specialists’ well-being and performance.\textsuperscript{57} Sociodemographic variables had some relationship with consultants’ psychological morbidity symptoms, which warrants further exploration in future research. Nevertheless, psychosocial work characteristics remain better predictors of the study outcomes used. Consequently, comprehensive interventions that simultaneously target organisational, material and work-time-related conditions may be more beneficial to workers’ health, than interventions only targeting the individual.\textsuperscript{58} Government and healthcare leaders need to consider how future organisational decisions in the NHS may further impact on consultants’ psychosocial work characteristics and, in turn, their work-related well-being. Although the NHS is under increasing demand and financial strain, greater dialogue between consultants, hospital managers and government officials, at both the local and national level, will go some way in influencing how work-related pressure and job autonomy are perceived and managed.\textsuperscript{36} \textsuperscript{37}

**Strengths and limitations**

This study, to the best of our knowledge, is the first to demonstrate the mediating role of burnout between psychosocial work characteristics of NHS consultants and their reported depressive and anxiety symptoms and intentions to seek early retirement. Using a broad range of standard psychometric measures with reported cut-off scores allows for comparison with other studies of this (and other) professional groups. Also, Hayes’ PROCESS Model 4 macro with bootstrapping was used to test mediations, which generates more accurate CIs than other more commonly used mediation methods.

In addition to the issue of cross-sectional data already discussed, a number of further limitations need to be
acknowledged. First, because email invitations were sent via hospitals, we were not able to determine the response rate for this study. The sample size is smaller than that of past research into the prevalence of psychological morbidity among UK consultants. This means that generalising this study’s findings to the NHS consultant population, or even consultants more broadly, needs to acknowledge these sample and sampling limitations. The second limitation recognises that all study variables were drawn from self-report data of the individual consultant, making it vulnerable to common method bias; but, at the same time, this is an established method in quantitative research. Finally, it is important to reiterate that the measures used for depressive and anxiety symptoms do not reflect a clinical diagnosis of depression and anxiety. Instead, it represents the number of relevant symptoms and, therefore, these prevalence statistics should not be conflated with actual levels of depression or anxiety.

CONCLUSION
The findings from the current study contribute to the small, but growing research area, namely: the examination of NHS consultants’ work-related well-being and the contributing role of their psychosocial working environment. Another important empirical contribution of this study is the observed evidence of experienced burnout symptoms mediating (either partially or fully) the observed relationship between job autonomy and work-related pressures in relation to surveyed consultants’ psychological morbidity symptoms. This highlights the salient role of burnout as an intervening variable, and is especially concerning given the high prevalence of consultants scoring as ‘high’ on the burnout and psychological morbidity symptom measures. These findings emphasise the importance of preventing and mitigating burnout, and the cultivation of skill discretion and autonomy among consultants as an important organisationally focused preventive strategy. This is important for the NHS’ ability to provide safe and high-quality care, and to maintain and retain a healthy and productive workforce.

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Contributors AK and JH conceived the study concept and design. AK and KT drafted the first version of the manuscript. KT and JH provided critical revision of the manuscript as it went through the revision process. SI and KT did the data management and statistical analyses. All authors contributed to the content and critical revision of the report, and agreed to submit the report for publication.

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Data sharing statement Individual participant data collected under this study were de-identified which are reported in the form of tables. The original proposal of the study will be available on request. De-identified data will be shared for non-commercial research purposes given the consent of the lead author after the publications as per guidelines of the BMJ Open.

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