Burnout mediates the association between symptoms of depression and patient safety perceptions

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ABSTRACT

Background

There is growing interest in the relationships between depressive symptoms and burnout in healthcare staff and the safety of patient care. Depressive symptoms are higher in healthcare staff than the general population and overlap conceptually with burnout. However, minimal research has investigated these variables in nurses. Given the conceptual overlap between depressive symptoms and burnout, there is also a need for an explanatory model outlining the relative contributions of these factors to patient safety.

Aims

To investigate the relationships between depressive symptoms, burnout and perceptions of patient safety. A mediation model was proposed whereby the association between symptoms of depression and patient safety perceptions was mediated by burnout.

Design

A cross-sectional questionnaire was distributed at three acute NHS Trusts.

Method

Three-hundred and twenty-three hospital nursing staff completed measures of depressive symptoms, burnout and patient safety perceptions (including measures at the level of the individual and the work area/unit) between December 2015 - February 2016.

Results

When tested in separate analyses, depressive symptoms and burnout facets were each associated with both patient safety measures. Furthermore, the proposed mediation model was supported, with associations between depressive symptoms and patient safety perceptions fully mediated by burnout.

Conclusion

These results suggest that symptoms of depression and burnout in hospital nurses may have implications for patient safety. However, interventions to improve patient safety may be best targeted at improving burnout in particular, with burnout interventions known to be most effective when focused at both the individual and the organisational level.

Keywords: burnout, depression, healthcare, health services, nursing, patient safety, workforce issues

SUMMARY STATEMENT

Why is this research needed?

- A small number of studies have found that burnout and depressive symptoms are linked with patient safety outcomes in healthcare staff, but further research is needed in nursing populations.

- There is a need to better understand how depressive symptoms and burnout relate to each other and to patient safety in nursing staff.

What are the key findings?

- When tested in separate analyses, burnout and depressive symptoms were each directly associated with patient safety perceptions in nursing staff.

- A mediation model was tested and results indicated that burnout fully mediated the association between depressive symptoms and patient safety perceptions.

How should the findings be used to influence policy/practice/research/education?

- These results highlight the importance of supporting nurse wellbeing to enhance the quality and safety of patient care.

- In particular, these results suggest that burnout may be the more important staff wellbeing factor for patient safety interventions to focus on.

- Burnout interventions should focus on both work-restructuring interventions in addition to individual-level interventions such as mindfulness courses.

INTRODUCTION

Background

With around 10% of hospital inpatient episodes affected by clinical errors (Baines et al., 2013, Vincent et al., 2001) improving patient safety remains a priority in acute healthcare settings. To develop interventions to reduce errors, a growing body of research has sought to understand underlying causes and contributing factors. One area has focused on the role that human factors such as staff burnout and depressive symptoms may play (Hall et al., 2016).

The burnout concept originated in health services and describes a chronic stress response comprising three dimensions of emotional exhaustion, depersonalisation and low accomplishment (Maslach and Jackson, 1981). Due concerns about the validity and relevance of the personal accomplishment scale (Demerouti and Bakker, 2008, Demerouti et al., 2001), much research has focused on the remaining two dimensions. Emotional exhaustion captures feelings of emotional and physical resource depletion and depersonalisation captures excessively detached attitudes towards patients (Maslach et al., 2001). A range of factors can lead to burnout, including excessive workload, work conflicts and personality factors (Garrosa et al., 2008). When it occurs, burnout may have wide-ranging consequences such as lower staff empathy and poorer patient experience (Vahey et al., 2004, Leiter et al., 1998, Passalacqua and Segrin, 2012). Several studies indicate that burnout may also be linked with clinical errors (Hall et al., 2016), although the majority of this research has been amongst doctors.

Depression is a broader concept which is statistically and conceptually distinct from burnout (Iacovides et al., 2003, Thuynsma and de Beer, 2016). Rather than focusing on work-related attitudes, the concept of depression encompasses a more holistic sense of low mood and psychological distress (Henry and Crawford, 2005). Research suggests that depression is not a discrete category, but one that exists on a continuum, ranging from low depression (or

fewer depressive symptoms), to high depression (or more depressive symptoms) (Wood et al., 2010, Hankin et al., 2005). Similarly to burnout, depressive symptoms in healthcare staff may have consequences for patient care such as a greater likelihood of cognitive failures and medical errors (Allan et al., 2014, West et al., 2006). However, there has been less research into the consequences of depressive symptoms than burnout and only two studies have investigated depressive symptoms and patient safety amongst nursing staff (Tanaka et al., 2012, Saleh et al., 2014).

Symptoms of mental health problems such as depression have long been known to be elevated amongst healthcare staff, particularly in nurses (Su et al., 2009, Letvak et al., 2012, Wall et al., 1997) and recent reports suggest that burnout rates are increasing (Shanafelt et al., 2015, Ives et al., 2015). As such, identifying associations between burnout, depressive symptoms and patient safety could both highlight an area for patient safety interventions to target and suggest that such interventions are of escalating importance.

Contribution of the research

There are two main areas that need addressing. First, most studies investigating burnout or depressive symptoms and patient safety have focused on medical staff, so there is a need for further research in nursing staff, as a considerable amount of patient care is centred around the work of nurses (Hughes, 2008). To date, no research has investigated either depressive symptoms or burnout and patient safety in UK hospital nurses. Of the studies which have been conducted in nursing, results suggest that higher levels of burnout and depressive symptoms are associated with lower perceptions of patient safety (Halbesleben et al., 2008, Laschinger and Leiter, 2006) and higher rates of objectively measured errors (Saleh et al., 2014), although these findings have not been replicated consistently (Holden et al., 2011).

Second, there is a need to understand how burnout and depressive symptoms relate to each other in their association with patient safety. The two concepts are overlapping but distinct and interventions to reduce depressive symptoms differ from those aiming to reduce burnout. In particular, while interventions addressing depressive symptoms may focus at the level of the individual (e.g., mindfulness), interventions for burnout should also involve organisational-level change, considering work-related changes such as work process restructuring, shift readjustments and performance appraisals (Awa et al., 2010, West and Dawson, 2012). A small number of studies have investigated both burnout and depressive symptoms (de Oliveira Jr et al., 2013, Dyrbye et al., 2013, Fahrenkopf et al., 2008, Garrouste-Orgeas et al., 2015), but none have proposed an explanatory model of how these variables contribute together to patient safety outcomes. Furthermore, each of these studies has been amongst doctors and no research has investigated these variables together in nursing staff. Based on evidence that i) depressive symptoms increase risk of burnout (Ahola et al., 2005), ii) burnout is the more consistent predictor of subsequently reported errors (West et al., 2006, West et al., 2009) and ii) healthcare staff attribute errors to work-related stressors, fatigue and burnout (Shanafelt et al., 2010), we propose that the two variables relate to patient safety outcomes via a mediating model (see Figure 1a). This model does not suggest that depressive symptoms result in burnout, but rather that it is the proportion of depressive symptoms that overlap with burnout that is associated with patient safety perceptions (see Figure 1b). If this is the case, it may suggest that while staff-level interventions for depressive symptoms, such as mindfulness, could have patient safety benefits, interventions to enhance patient safety may be better targeted at addressing burnout.
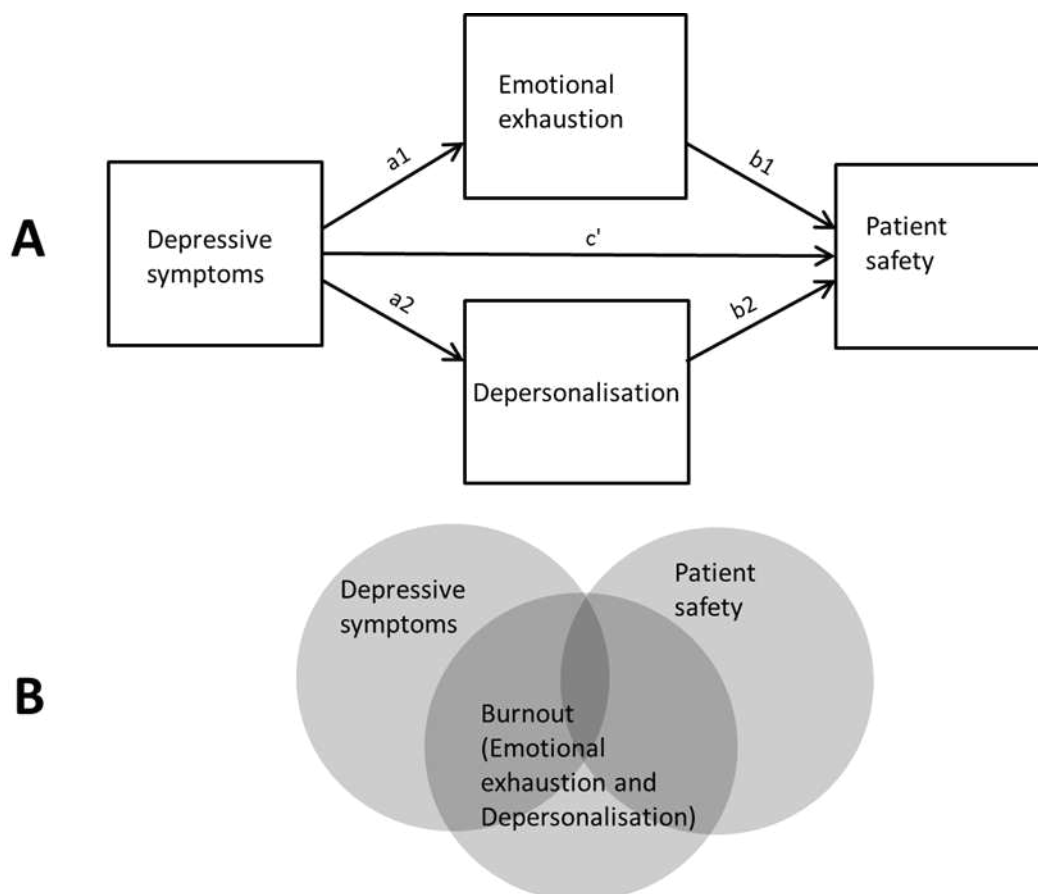
Figure 1

Theoretical framework

This work was grounded in Hobfoll's Conversation of Resources model (COR) (Hobfoll, 2001). This model suggests that a person experiences psychological stress: (1) when their resources are threatened with loss; (2) when their resources are actually lost; and (3) when they fail to gain anticipated resources following significant resource investment. The term 'resource' loosely refers to commodities related to individual values and can allude to personal, social and economic assets. Once an individual is experiencing psychological distress, the model proposes that they will be more cautious with investing future resources.

In the healthcare literature, research using the COR has focused on the concept of burnout as psychological distress and has investigated the relationship between burnout and patient safety (Halbesleben et al., 2008, Welp et al., 2014). It has been suggested that once a

healthcare professional is experiencing burnout – a form of psychological stress – they may be likely to 'pull away' from their patients and focus their efforts on specific aspects of their job which they find enjoyable (Halbesleben et al., 2008). Halbesleben and colleagues (2008) suggest burnout contributes to patient safety risks by diverting attention towards preferred aspects of work and reducing extra behaviours that would benefit the organisation. The current study tested the COR model in a sample of UK hospital nurses, investigating whether the model's predictions regarding an association between burnout and patient safety was confirmed. Furthermore, we sought to extend this model by testing whether these findings held when depressive symptoms were included as the form of psychological distress, rather than burnout.

THE STUDY

Aims

The present study investigated the relationships between depressive symptoms, burnout and patient safety in hospital nursing, taking a cross-sectional approach. In line with previous research, the two burnout facets of Emotional Exhaustion and Depersonalisation were included (Halbesleben et al., 2008). Safety perceptions were used to measure patient safety, as previous research has suggested these are associated with objectively measured patient safety outcomes (Hansen et al., 2011, Hofmann and Mark, 2006, Mardon et al., 2010) and are useful for detecting variations in perceived safety between individual practitioners (Halbesleben et al., 2008, Louch et al., 2016). There were two hypotheses:

Hypothesis 1: There will be a direct association between depressive symptoms and patient safety perceptions.

Hypothesis 2: The two facets of burnout (Emotional Exhaustion and Depersonalisation) will mediate the association between depressive symptoms and patient safety perceptions.

Design

      A cross-sectional questionnaire design was used.

Participants

      A convenience sample of UK hospital nurses, midwives and healthcare assistants were recruited from three acute NHS Trusts from December 2015 - February 2016.

Data collection

      The study was advertised through posters displayed in hospital staff rooms. Questionnaires were distributed on wards and participants completed these in a location and at a time of their choice. Participants were informed of the date when questionnaires would be collected and could return these to the researchers directly, or leave them in sealed envelopes in drop-boxes in secure, locked rooms. Participants could choose to be entered into a prize draw for shopping vouchers (20 prizes with a total value of £900).

Measures

Demographic information

      Information regarding age, length of time in post, gender, qualifications and typical hours worked per week were recorded in a questionnaire proforma.

Depressive symptoms

      Depressive symptoms were measured using the Depression subscale of the 21-item version of the Depression, Anxiety and Stress Scale (DASS-21) (Henry and Crawford, 2005). This contains seven items including 'I found it difficult to work up the initiative to do things'. Participants rated the extent to which they experienced each item in the past week on a 4-point scale from 0 ('Did not apply to me at all') - 3 ('Applied to me very much, or most of the time'). Possible scores ranged from 0-21.

Burnout

Burnout was measured using the Emotional Exhaustion and Depersonalisation subscales of the Maslach Burnout Inventory (MBI) (Maslach and Jackson, 1981). The Emotional Exhaustion subscale comprises nine items including 'I feel emotionally drained from my work'. The Depersonalisation subscale contains five items including 'I feel I treat some patients as if they were impersonal objects'. Items were rated on a 7-point scale from 0 ('Never') - 6 ('Every day'). Possible scores ranged from 0-63 on the Emotional Exhaustion subscale and 0 to 35 on the Depersonalisation subscale.

Patient safety perceptions

Perceptions were reported at both the individual level and the work area/unit level, based on evidence that these measures provide useful and complementary information that vary between nurses in response to stress and individual differences (Louch et al., 2016).

Individual safety perceptions. To assess perceptions of safety at the level of the individual, participants completed the Safe Practitioner Measure (Louch et al., 2016), a one-item statement ('My practice is not as safe as it could be because of work related factors/conditions'). The was rated from 1 ('Strongly disagree') - 5 ('Strongly agree') (Louch et al., 2016). Responses were recoded such that higher scores indicated a more favourable perception.

Work area/unit safety perceptions. Perceptions of patient safety at the work area/unit level were measured using a four-item measure from the Agency for Healthcare Research and Quality (AHRQ) Hospital Survey on Patient Safety Culture (HSOPC) (Sorra and Nieva, 2004). Items included, 'It is just by chance that mistakes don't happen around here' and were scored from 1 ('Strongly disagree') 5 ('Strongly agree'). Possible scores ranged from 0-20. Higher scores indicated more favourable perceptions.

Ethical considerations

Participants were given an information sheet about the study and asked to provide written informed consent. On collection of the questionnaires, identifiable information was separated from non-identifiable questionnaire data and stored securely. The research was approved by the University of Leeds, School of Psychology Ethics Committee (15-0183).

Validity, reliability and rigour

Depressive symptoms

The DASS-21 depression subscale (Henry and Crawford, 2005) demonstrated good internal consistency in the current study ($\alpha = 0.87$). Previous research indicates that the subscale has convergent validity with longer depression measures (Norton, 2005).

Burnout

The MBI subscales (Maslach and Jackson, 1981) demonstrated acceptable internal consistency in the current study ($\alpha = 0.83$ for Emotional Exhaustion, $\alpha = 0.70$ for Depersonalisation).

Patient safety perceptions

Individual safety perceptions. Previous research has found convergent reliability between this item and nurse-patient ratios and longer patient safety measures (Louch et al., 2016).

Work area/unit safety perceptions. The AHRQ subscale (Sorra and Nieva, 2004) demonstrated acceptable internal consistency in the current study ($\alpha = 0.74$) and has previously been established as an effective measure for gathering patient safety perceptions in nursing staff (Halbesleben et al., 2008, Louch et al., 2016).

Data analysis

Preliminary data analysis was undertaken using SPSS version 22. Descriptive statistics (means and standard deviations) and bivariate associations were conducted for study variables and the demographic variables 'length of time in current position' and 'typical

hours worked per week'. Spearman's Rho correlations were performed, as the distributions of

most variables in the dataset did not conform to the assumptions of normality.

Missing data analyses were then undertaken for study variables. Rates of missing data

on individual measures ranged from 0% (safe practitioner measure) to 10.2% (Emotional

Exhaustion subscale). In total, 15.48% of cases were missing data for one or more measures.

Little's chi-square statistic for testing whether values are missing completely at random

(MCAR) (Little, 1988) was not significant (x=30.06, df=31, p=0.51), indicating there was no

systematic pattern to the missing data. When data is not missing systematically and overall

rates of missing data are <20%, data imputation is preferred over case deletion, as this

preserves statistical power (Garson, 2015). Data imputation was conducted using regression

imputation in AMOS 22. This method first fits the proposed statistical model using maximum

likelihood and model parameters are set as equal to their maximum likelihood estimates.

Linear regression is then used to predict each missing value as a linear combination of the

observed values for that same case. Predicted values are imputed for missing values

(Arbuckle, 2013).

To examine whether the associations between depressive symptoms and patient safety

perceptions were mediated by the two burnout subscales (Emotional Exhaustion and

Depersonalisation), Structural Equal Modelling (SEM) was undertaken using AMOS 22. This

approach has three main benefits over the 'causal steps' hierarchical regression approach

outlined by Baron and Kenny (1986). First, it has greater flexibility and enables the testing of

multiple mediators in one model (Preacher and Hayes, 2008). Second, measurement errors

can bias the parameter estimates for mediation resulting from the hierarchical regression

approach, but these can be controlled for in the SEM approach (Cheung and Lau, 2007).

Third, the AMOS 22 programme enables hypothesis tests to be conducted using the

bootstrapping method. Bootstrapping is a nonparametric resampling procedure which does

not require data distributions to conform to the assumptions of parametric tests (e.g., normality). Bootstrapping provides the most powerful method for obtaining confidence limits for mediation effects (Preacher and Hayes, 2008) and Cheung and Lau (2007) suggest that a sample size of 100 provides adequate power to detect a medium to large effect size.

We used the bootstrapping approach (5000 bootstrap samples; 95% confidence interval) to test six models. All models controlled for age, gender and length of time in current position. The first model tested the direct association between depressive symptoms and safety perceptions at the individual level and the second model repeated this but instead used patient safety perceptions at the work area/unit level. The second two models (one for each outcome measure) then tested whether any direct association was mediated by the two burnout facets (Emotional Exhaustion and Depersonalisation; Figure 1). For completeness, the final two models then tested for the opposite mediation pattern, whereby depressive symptoms mediated the association between the two burnout facets (Emotional Exhaustion and Depersonalisation) and each patient safety outcome variable. In line with recommendations by Cheung and Lau (2007), bias-corrected bootstrap confidence intervals were calculated and used to test hypotheses.

We also calculated fit statistics for each model. The use of model fit indices in studies of mediation using SEM is much debated, as proposed cut-off values have often been based on research using simulated models with a large number of degrees of freedom (df) (Kenny et al., 2014). The commonly used RMSEA statistic is particularly unreliable in the context of small df models, such as those used to test for mediation. In line with recommendations by Kenny and colleagues (Kenny et al., 2014, Kenny, 2016), we reported the chi-squared statistic (X^2), the Comparative Fit Index (CFI), where values above 0.9 were considered acceptable and the Akaike Information Criterion (AIC). There are no recommended cut-offs for the AIC, but lower values represent better fit.

RESULTS

Participant characteristics

Three-hundred and twenty-three eligible participants completed the questionnaires (M age=39.79, SD= 12.31, 92.3% female). Ninety-one percent of participants were white, 1.9% were Afro-Carribean, 2.2% were Asian, 3.1% were of another ethnicity, 1.5% preferred not to state their ethnicity and data were missing for 0.3% of participants. For education, 4% of participants reported a Masters degree as their highest qualification, 48.9% reported a bachelors degree, 18.6% reported A-Levels or equivalent, 16.1% reported GCSEs or equivalent, 7.4% had completed some secondary school and 4.6% reported 'other'. Data were missing for 0.3% participants. In terms of staff position in the hospital, 42.1% of participants were staff nurses, 31.9% were healthcare assistants, 13.6% were ward sisters/charge nurses, 4% were ward managers, 3.7% were midwives, 2.5% were agency staff and 1.9% were student nurses.

Descriptive statistics

Descriptive statistics for study variables are presented in Table 1. Spearman's Rho correlations indicated significant positive associations between both the Safe Practitioner measure and the AHRQ with depressive symptoms (r_s=-0.28, p<0.001 and r_s=-0.34, p<0.001, respectively), Emotional Exhaustion (r_s=-0.41, p<0.001 and r_s=-0.51, p<0.001, respectively) and Depersonalisation (r_s= -0.43, p<0.001 and r_s=-0.45, p<0.001, respectively). There were also significant positive associations between hours worked with Emotional Exhaustion (r_s=0.15*, p=0.01) and Depersonalisation (r_s=0.16, p=0.005), but not depressive symptoms (r_s=0.05, p=0.42).

Table 1: Means, Standard deviations [a] and correlations for variables

	Mean	2	3	4	5	6	7
1.Length of time in current position (months)	96.05 95.67	-.26***	-.02	-.14*	.08	.02	-.06
2.Typical hours per week	35.39 20.07		.02	-.05	.05	.15*	.16**
3. Individual-level safety (Safe practitioner measure)	3.11 1.19			.48***	-.28***	-.41***	-.43***
4. Work area/unit level safety (AHRQ subscale)	12.49 3.73				-.34***	-.51***	-.45***
5.Depression (DASS subscale)	4.27 4.30					.67***	.52***
6.MBI Emotional Exhaustion	26.08 13.00						.60***
7. MBI Depersonalisation	6.50 6.00						

Note. *p<0.05, **p<.01, ***p<0.001. AHRQ = Agency for Healthcare Research and Quality; DASS = Depression, Anxiety and Stress Scale; MBI = Maslach Burnout Inventory. [a]Standard deviations appear in italics below the means.

Structural Equation Models

We then constructed a series of six structural equation models to test our mediation hypotheses. We used bootstrapping, a nonparametric resampling procedure which provides the most powerful method of obtaining confidence limits for mediation effects.

Depressive symptoms and patient safety perceptions

When depressive symptoms were the only predictor variable in the models, there was a direct association between these and individual level safety perceptions (c = -0.277, CI=-0.364,-0.181, p =0.001; $X^2(3)$=2.537, p=0.469, CFI=1, AIC=36.537; Figure 2) and work area/unit level safety perceptions (c=-0.303, CI=-0.404,-0.193, p<0.001; $X^2(3)$=9.304, p=0.026, CFI=0.951, AIC=43.304; Figure 3).
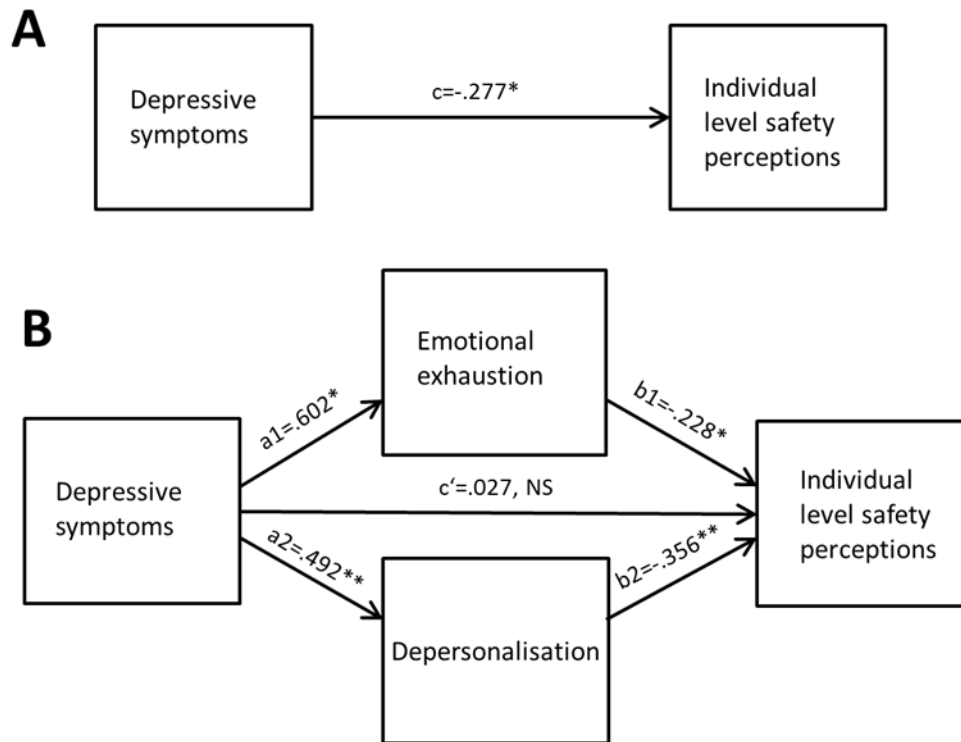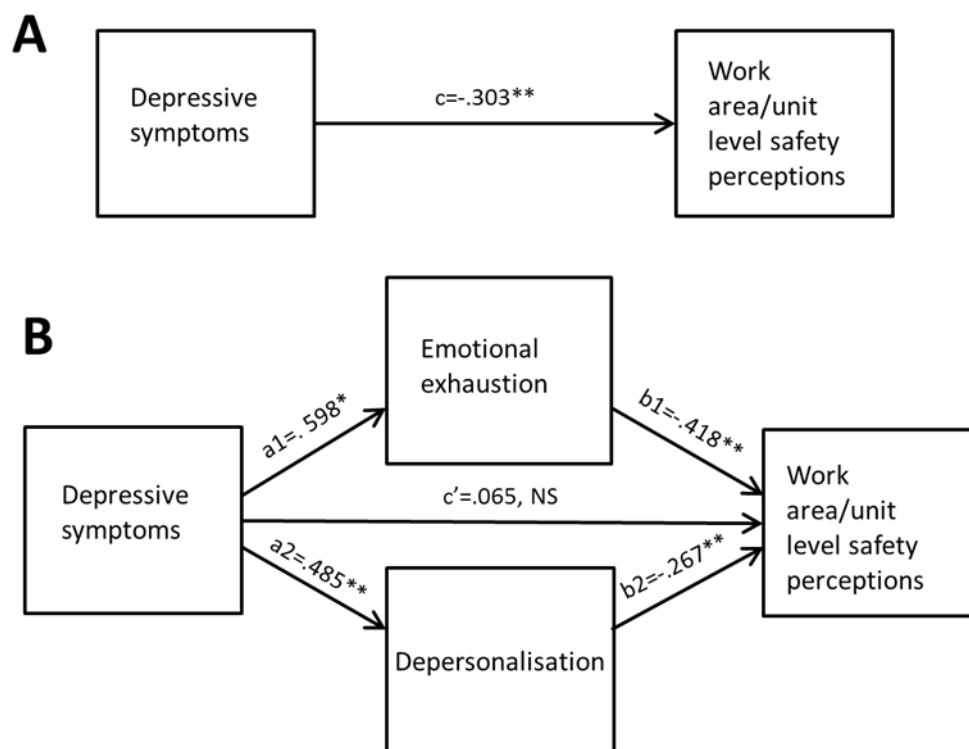
Figure 2

Figure 3

Burnout as a mediator of the association between depressive symptoms and patient safety perceptions

When the burnout facets (Emotional Exhaustion and Depersonalisation) were included in the model with individual safety perceptions as the outcome variable (Figure 2B), the direct association between depressive symptoms and safety ceased to be significant (c'=0.027, CI=-0.103, 0.163, p=0.730). The direct associations between depressive symptoms and Emotional Exhaustion (a1=0.602, CI=0.495, 0.685, p=0.001) and Depersonalisation (a2= 0.492, CI=0.402, 0.576, p <0.001) were significant, as were the direct associations between Emotional Exhaustion and Depersonalisation and individual safety (b1=-0.228, CI=-0.403, -0.075, p=0.002 and b2=-0.356, CI=-0.465,-0.246, p <0.001, respectively). These results indicated that the two facets of burnout fully mediated the association between depressive symptoms and perceived patient safety. Model fit indices were $X^2(10)=58.643$, p<0.001, CFI=0.902, AIC=108.643.

Similar results were found when the model was tested with work area/unit level safety perceptions as the outcome variable (Figure 3B). With Emotional Exhaustion and Depersonalisation included as mediators, the direct association between depressive symptoms and safety ceased to be significant (c'=0.065, CI=-0.074, 0.219, p=0.411). The direct associations between depressive symptoms and Emotional Exhaustion (a1=0.598, CI=0.486, 0.679, p=0.001) and Depersonalisation (a2= 0.485, CI=0.393, 0.569, p<0.001) were significant, as were the direct associations between Emotional Exhaustion and Depersonalisation and work area/unit level safety perceptions (b1=-0.411, CI=-0.554, -0.294, p=0.001 and b2=-0.267, CI=-0.387, -0.145, p<0.001, respectively). Again, these results indicated that the two facets of burnout fully mediated the association between depressive

symptoms and perceived patient safety. Model fit indices were $X^2(10)=66.146$, p<0.001, CFI=0.893, AIC=116.146.

Testing depressive symptoms as a mediator of the association between burnout and patient safety perceptions

For completeness, we then repeated these two models but reversed the mediation pattern, in effect testing whether the association between the burnout facets (Emotional Exhaustion and Depersonalisation) and the patient safety outcome variables ceased to be significant once depressive symptoms were included as a mediator in the models. Neither of these found evidence for the reverse mediation pattern.

In the model testing individual patient safety perceptions as the outcome variable (Figure 4A), Emotional Exhaustion and Depersonalisation were both significantly associated with depressive symptoms (a1=0.482, CI=0.324, 0.623, p=0.001 and a2=0.206, CI=0.059, 0.355, p=0.006). Emotional Exhaustion and Depersonalisation were also both significantly associated with patient safety perceptions (c'1=-0.224, CI=-0.390, -0.075, p=0.002 and c'2=-0.348, CI=-0.455, -0.240, p<0.001). However, depressive symptoms were not directly associated with patient safety perceptions, suggesting they were not a mediator (b=0.025, CI= -0.105, 0.156, p=0.767).
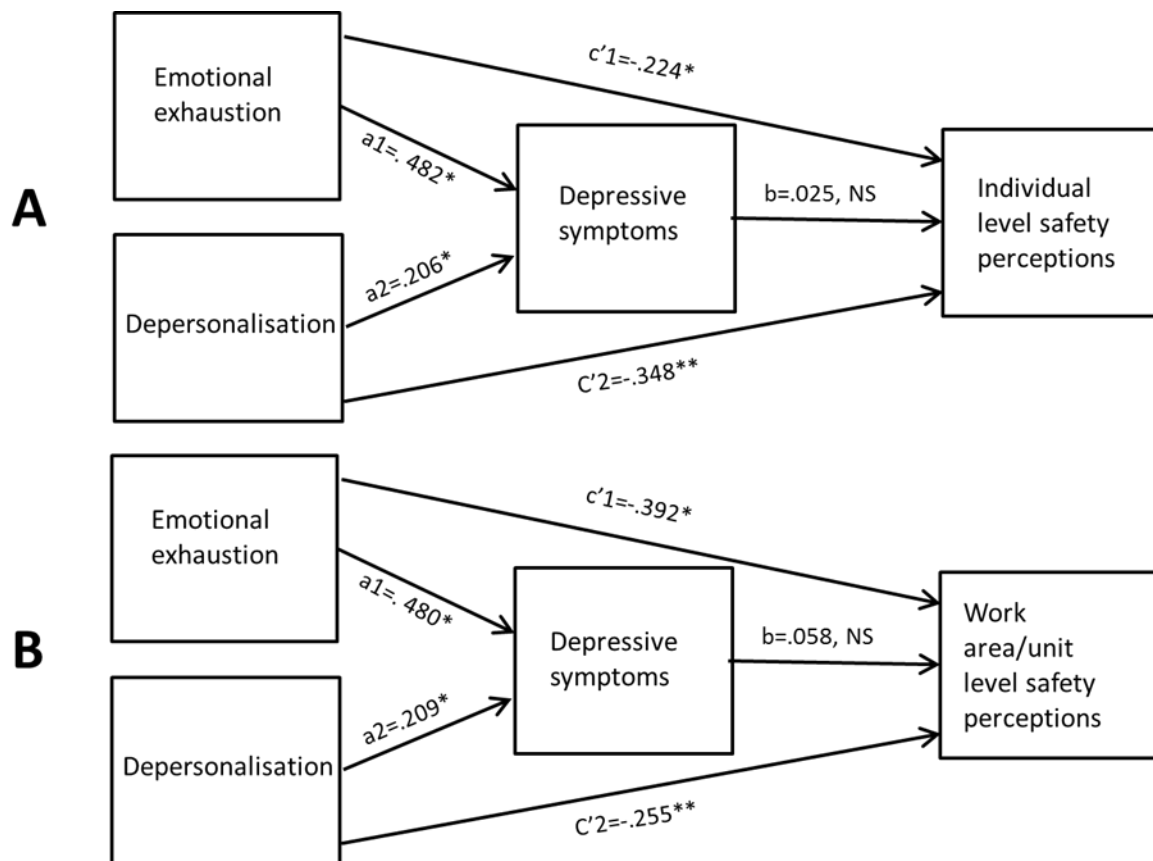
Figure 4

In the model testing patient safety perceptions at the area/unit level safety as the outcome (Figure 4B), Emotional Exhaustion and Depersonalisation were both significantly associated with depressive symptoms (a1=0.480, CI=0.322, 0.620, p=0.001 and a2=0.209, CI=0.062, 0.356, p=0.004). Emotional Exhaustion and Depersonalisation were also both significantly associated with patient safety perceptions (c'1=-0.392, CI=-0.532, -0.281, p=0.001 and c'2=-0.255, CI=-0.371, -0.135, p<0.001). However, depressive symptoms were not directly associated with patient safety perceptions, suggesting they were not a mediating variable (b=0.058, CI=-0.076, 0.205, p=0.449).

Interestingly, the fit indices for these models were better than the initial models ($X^2(6)=5.605$, p<0.469, CFI=1, AIC=63.605 for individual patient safety perceptions and $X^2(6)=18.679$, p=0.005, CFI=0.975, AIC=76.679 for ward level perceptions).

DISCUSSION

This paper presents findings from a cross-sectional questionnaire survey in UK hospital nurses from multiple clinical areas, across three acute NHS Trusts. The results suggested that there was a direct association between depressive symptoms and safety perceptions at both the individual and area level. However, this association was fully mediated by two facets of burnout, Emotional Exhaustion and Depersonalisation. Interestingly, the best overall model fit was found when burnout variables were modelled as predictors in the models, with depressive symptoms modelled as an outcome of burnout. However, no evidence was found for the reverse mediation pattern (where depressive symptoms mediated the association between burnout and patient safety perceptions).These findings add to the literature in three main ways.

First, these results support previous research indicating an association between burnout and patient safety in medical staff (Fahrenkopf et al., 2008, West et al., 2006) and extend this by finding the first evidence for this link amongst UK hospital nursing staff. Only a small number of studies have investigated whether burnout is associated with patient safety perceptions amongst nurses in any nation (Halbesleben et al., 2008, Laschinger and Leiter, 2006) and one previous study by Holden and colleagues reported no evidence for this link (Holden et al., 2011). Holden et al.'s study measured patient safety perceptions using a single item asking about perceived risk of medication error (Holden et al., 2011), whereas the present study measured patient safety using the Safe Practitioner Scale (SPS) (Louch et al., 2016) and the AHRQ Perceptions of Safety Subscale (AHRQ PSS) (Sorra and Nieva, 2004) and found evidence of this association according to both measures. It is possible that the divergence in results between the present study and the one by Holden and colleagues (2011) is owing to the measure of patient safety perceptions used, suggesting that the SPS and AHRQ PSS may be more sensitive measures suitable for future research in this area.

Second, these results provide the first evidence of an association between depressive symptoms and perceptions of patient safety in UK hospital nurses. Only a limited number of studies have previously investigated this and have focused on number of perceived errors (Tanaka et al., 2012, Saleh et al., 2014). The current study finds further support for a link between depressive symptoms and safety perceptions in nurses, suggesting this is also present in UK nurses. Furthermore, by measuring safety perceptions using the SPS and AHRQ PSS, the current study suggests that this link generalises to both individual safety perceptions and perceptions at the area level.

Third, this study proposed and tested the first explanatory model of the relationships between burnout, depressive symptoms and patient safety perceptions and found evidence that the association between depressive symptoms and safety is explained by the overlap between depressive symptoms and burnout. Few studies have investigated both burnout and symptoms of depression together (Fahrenkopf et al., 2008, Dyrbye et al., 2013, de Oliveira Jr et al., 2013, Garrouste-Orgeas et al., 2015) and none have proposed mechanisms for how these variables contribute together to patient safety perceptions. Furthermore, each of these studies was amongst medical staff. Results from the present study support previous findings that both variables are separately associated with patient safety perceptions and extend this to suggest that this association is also present in nursing staff groups. Importantly, the current study suggests that burnout may be the more important variable in relation to patient safety. Not only was the association between depressive symptoms and patient safety perceptions entirely mediated by burnout, but the best statistical model fit was found when depressive symptoms were considered an outcome of burnout, rather than a predictor of burnout and patient safety perceptions. However, it should be noted that as a cross-sectional study, it is not possible to draw conclusions regarding cause and effect and the associations described could be bi-directional.

Theoretical framework

The study was grounded in the Conversation of Resources model (COR) (Hobfoll, 2001), which suggests that once a person is experiencing psychological distress, they will become cautious regarding resource investment. Theorists have proposed that burnout is a form of psychological stress (Halbesleben et al., 2008, Welp et al., 2014) and have used the model to explain the links between burnout and patient safety perceptions. In particular, it has been suggested that once a healthcare staff member is experiencing burnout, they may stop investing their personal resources by 'pulling away' from their patients, instead focusing their efforts only on aspects of their job which they enjoy (Halbesleben et al., 2008). The current study tested the predictions of this model in a UK nursing sample and found evidence that as the model would suggest, both forms of psychological distress measured (depressive symptoms and burnout) were linked with patient safety perceptions. The current study also extends the model by finding evidence that work-related psychological distress (i.e., burnout) may be the more important variable leading to inhibition of resource investment amongst nurses, explaining the association between more general psychological distress (i.e., depressive symptoms) and safety perceptions.

Limitations

The study was limited by its cross-sectional design, which prevents the extent to which any causal interpretations can be made regarding the data. Previous longitudinal research has indicated that the relationship between depressive symptoms, burnout and errors may be cyclical, with depressive symptoms or burnout increasing risk for subsequent errors and involvement in errors leading to increased risk of depressive symptoms or burnout (West et al., 2006, West et al., 2009). In the current study we were interested in understanding patient safety as the outcome variable, but it is possible that the relationships between each of the variables studied may be bi-directional.

The study was also limited by reliance on self-report measures, which may have led to bias in responses. However, each of the measures was carefully selected and had been previously validated as suitable self-report tools. Furthermore, there are no objective rating tools for burnout and collecting accurate objective patient safety outcome data for nurses at the individual level is rarely possible, owing to the team-based nature of nursing work. Previous research has suggested that safety perceptions are associated with objectively measured patient safety outcomes (Mardon et al., 2010, Hofmann and Mark, 2006, Hansen et al., 2011) and are useful for capturing individual-level variations in patient safety (Halbesleben et al., 2008, Louch et al., 2016).

Finally, as questionnaires were not addressed to individual nurses, the study was limited by a lack of response rate information. However, as questionnaires were distributed to three acute NHS Trusts, our sample will only reflect a minority of eligible participants, which may have led to a higher rate of extreme responders (e.g., participants particularly high or low on measures of depressive symptoms/burnout). Whilst conclusions from inferential statistics are likely to be robust to this bias, this limits the interpretation of overall burnout/depressive symptoms reported.

Implications

There is an increasing recognition of the importance of healthcare staff wellbeing in contributing to patient outcomes (NHS, 2013, DoH, 2013). However, the concept of wellbeing has been poorly defined and as such, it has been unclear where interventions to support and promote staff wellbeing should be focused. Due to the limited sample size, the current results must be interpreted with caution. However, they offer the tentative suggestion staff burnout, rather than depressive symptoms, may be particularly important in relation to patient safety and interventions focused on reducing burnout may be beneficial for patient safety outcomes. Burnout interventions are thought to be most effective when they not only

address staff stress via individual-level interventions, for example staff counselling, but when they also address aspects of the workplace (Awa et al., 2010). Such interventions might consider restructuring work processes, adjusting shifts or implementing or changing performance appraisals (Awa et al., 2010, West and Dawson, 2012). These types of interventions require organisational involvement and can be challenging to deliver, however the current research suggests they may be more beneficial for patient safety than those targeted only at addressing personal staff stress levels.

Future research

Longitudinal research is necessary to understand the relationships between depressive symptoms and burnout on patient safety outcomes over time. Previous research in doctors suggests that the relationship may be cyclical (West et al., 2006, West et al., 2009), but further research is needed to explore this in a nursing population. Research is also needed to test whether interventions targeting staff burnout are effective for burnout reduction and lead to concomitant improvements in staff safety perceptions. No studies have yet tested this in either medical or nursing populations.

CONCLUSION

When tested in separate analyses, both depressive symptoms and burnout were associated with patient safety perceptions amongst UK hospital nurses. Furthermore, the association between depressive symptoms and perceptions of patient safety was fully mediated by burnout. These findings suggest that nurse wellbeing may have implications for patient safety and that interventions focused on addressing burnout, rather than symptoms of depression, may be most effective for patient safety improvements.

CONFLICT OF INTEREST STATEMENT

No conflict of interest has been declared by the authors.

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