

**Senior management leadership, social support, job design and stressor-to-strain relationships in hospital practice**

**Sandra C. Buttigieg<sup>1§</sup> Michael A. West<sup>2</sup>**

*<sup>1</sup>Department of Health Services Management, Faculty of Health Sciences, University of Malta, Mater Dei Hospital, Msida, MSD 2090 Malta; Work and Organizational Psychology Group, Aston Business School, Aston University, Birmingham, B4 7ET, UK.*

*<sup>2</sup>Lancaster University Management School, Lancaster University, Lancaster LA1 4YX, UK.*

**§ Corresponding author information:**

Sandra C. Buttigieg

Email: [sandra.buttigieg@um.edu.mt](mailto:sandra.buttigieg@um.edu.mt)

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### **Abstract**

**Purpose** - The purpose of this paper was to examine the effect of quality of senior management leadership on social support and job design, whose main effects on strains, and moderating effects on work stressors-to-strains relationships were assessed.

**Design/methodology/approach** - A survey involving distribution of questionnaires was carried out on a random sample of health care employees in acute hospital practice in the UK. The sample comprised 65,142 respondents. The work stressors tested were quantitative overload and hostile environment, whereas strains were measured through job satisfaction and turnover intentions. Structural equation modelling and moderated regression analyses were used in the analysis.

**Findings** - Quality of senior management leadership explained 75% and 94% of the variance of social support and job design respectively, whereas work stressors explained 51% of the variance of strains. Social support and job design predicted job satisfaction and turnover intentions, as well as moderated significantly the relationships between quantitative workload/hostility and job satisfaction/turnover intentions.

**Research limitations/implications** - The findings are useful to management and to health employees working in acute/specialist hospitals. Further research could be done in other countries to take into account cultural differences and variations in health systems. The limitations included self-reported data and percept-percept bias due to same source data collection.

**Practical implications** - The quality of senior management leaders in hospitals has an impact on the social environment, the support given to health employees, their job design, as well as work stressors and strains perceived.

**Originality/value** - The study argues in favour of effective senior management leadership of hospitals, as well as ensuring adequate support structures and job design. The findings may be useful to health policy makers and human resources managers.

**Key words** - Job design, hospital practice, senior management leadership, social support, stress.

**Paper type** - Research paper

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## **Introduction**

The responsibility that falls under senior management leadership is viewed as an integral part of continuous quality improvement and as pivotal in health care reforms (Goodwin, 2003; Degeling and Carr, 2004). In the UK, for example, the (National Health Service) NHS has focused on the development of leadership qualities framework as a skills-focused approach (NHS Gateway to Leadership Programmes, 2009). Within this initiative, senior management leaders are expected to foster a positive social environment that stimulates both supervisor and co-worker support. In this context, supervisor support refers to the support by employees' immediate superior, whereas co-worker support refers to the support by peer workers in the same unit of work. Senior management leaders are also expected to exert their influence on their workplace environment and on how jobs are designed.

Furthermore, stress researchers have long recognized that hospitals rate among the highest in stress (Di Martino, 2003; Firth-Cozens, 2003; UK NHS Care Quality Commission, 2010). A recent result from the UK NHS staff survey shows that staff suffering from work-related stress in the previous 12 months is thirty-three per cent (UK NHS Care Quality Commission, 2010). Among the work stressors prevalent in hospitals, one of the most mentioned is quantitative overload (Karasek, 1989; Spector and Jex, 1998). Hostility in health care settings, on the other hand, is also recognised as a relevant work stressor (Di Martino, 2003; UK NHS Care Quality Commission, 2010). The latest results from the NHS staff survey show that in the previous 12 months staff experiencing: harassment, bullying or abuse from other staff is eighteen per cent; harassment, bullying or abuse from patients or their relatives is twenty-six per cent; and physical violence

from patients or their relatives is thirteen percent (UK NHS Care Quality Commission, 2010).

This study aims at investigating the relationships of quality of senior management leadership with social support and job design, which in turn are tested as main effects on strains (job satisfaction, turnover intention) and in the moderation of the work stressors (quantitative workload, hostility)-to-strains relationships (Figure 1). Although the worth of senior management leadership in the workplace is well-documented, research needs to provide further evidence on the extent and nature of its effectiveness in creating a healthy workplace (Kelloway, Teed, and Prosser, 2008). The current study contributes to knowledge by linking senior management leadership with work stress, as well as by considering social support and job design in the buffering hypotheses of stressor-to-strain relationships.

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Insert Figure 1  
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#### THEORETICAL FRAMEWORK AND HYPOTHESES FORMULATION

An ongoing debate in the leadership literature is whether or not managers and leaders are different, with managers often referred to as risk-averse bureaucrats, and leaders as inspirational visionaries (Allio, 2005; Day and Schoemaker, 2008; Kent, 2005; Kotterman, 2006). Zaleznik, Mintzberg, and Gosling (2003) argue that what organizations really need are people who can be both managers and leaders. The influence of senior management leaders in the workplace stems from their organizational position and power, their style with an effect on employees' behaviour and creation of organizational conditions, as well as on their ability to portray themselves as role models (Kinder, Hughes and Cooper, 2008). There are various

leadership theories that have been applied in research on leadership in health care. The qualities of transformational and charismatic leaders appear to particularly fit very well within health care organizations (Govier and Nash, 2009). However, in this paper we focus on the top or senior level of leadership, with the attributes of being both leaders and managers and having a clear vision of where the organization is heading; supporting innovation for the sake of improving patients' services; and having the ability of forging positive relationships within key stakeholders including other organizations. At the organizational level within the health service, Alimo-Metcalfe and Alban-Metcalfe (2001) argue that leaders should focus their attention on the way in which as managers, they are able to inspire both colleagues, as well as members of the external community. Therefore to be effective, they have to show their capability to communicate a vision, and through networking, use political and social skills to bring about the expected reform.

Bass and Avolio (1994) who have written extensively on transformational leadership, point out that, leaders have a direct impact on the most common work stressors among which are workload and interpersonal relations.

Senior management leaders are considered as drivers in shaping organizational culture and therefore to shape the quality of the social environment as part of quality improvement initiatives (Parker, Wubbenhorst, Young, Desai, and Charns, 1999). We posit that within the realm of the organizational support theory (Eisenberger, Huntington, Hutchison, and Sowa, 1986), employees, who perceive that their organization values their contributions, meets their socio-emotional needs, cares about their well-being and judges their jobs more favourably, report reduced stress, increased job satisfaction, as well as reduced turnover (Chen, Eisenberger, Johnson, Sucharski, and Aselage, 2009; Rhoades and Eisenberger, 2002).

The social support (House, 1981) and social exchange (Blau, 1964) theories explain how organizational support generated by senior management leaders impact on the level of supervisor and co-worker support. Social support can be defined as social relationships that integrate employees together to expand their capability for being buffered against stress (Karasek, Triantis & Chaudhry, 1982). Karasek and colleagues distinguished supervisor from co-worker support. Perceived supervisor support refers to the employees' perceptions on the degree to which supervisors value their contributions and care about their well-being (Kottke & Sharafinski, 1988). Co-worker support, on the other hand refers to co-workers assisting one another in their tasks when needed by sharing knowledge and expertise as well as providing encouragement and support (Zhou and George, 2001).

Senior management leaders influence the level of social support, which often involves the transfer of positive endorsements or appraisals from supervisors and co-workers (Blau and Scott, 2003). There is research evidence that leadership in health service settings makes a difference to the performance of teams, departments and organizations (Edmondson, 1999; Borrill et al., 2001). We posit that senior management leaders in hospitals are expected to influence the behaviour of supervisors and co-workers, as well as the nature and extent of supervisors' and co-workers' support. In this study, senior management leaders were the chief executives, top and senior managers, whereas supervisors were the middle managers working in the UK National Health Service and local government,

The social influence theory (Van Avermaet, 2001) explains how senior management leaders may influence the quality of job design. The underlying theoretical model of job design is the Job Characteristics Model (Hackman and Oldham, 1975; 1980), which includes autonomy – identified as being similar to

Karasek's definition of decision authority and intellectual discretion in the demand/control support model (Karasek and Theorell, 1990). Autonomy is the extent to which employees have a major say in scheduling their work, selecting the equipment they will use, and deciding on procedures to be followed. James and colleagues (1989, 1990) refer specifically to job design and autonomy as one of the requisites for organizational well-being and success. Job design in this study refers to the nature of the work, as well as to the job content and structure, and tasks and activities that members of staff perform in their organizations (Hackman and Oldham, 1975). We therefore can present our first hypothesis, namely:

**Hypothesis 1:** Quality of senior management leadership has positive associations with social support as provided by supervisors and co-workers, and with quality of job design in the workplace.

Work stress has been defined in one of three ways (Jex, Beehr, and Roberts, 1992): as a stimulus, as a response, or a stimulus-response relationship. Stress as an independent variable – stimulus, which refers to job stressors, that is the physical or psychological stimuli to which individuals respond (Cooper and Quick, 1999), which in our study are quantitative overload and hostility. Quantitative overload in this study is defined in terms of quantifiable extra hours worked per week, as well as in terms of social-derived reasons and work pressures perceived by staff to work these extra hours (Cox and Griffiths, 1995; Firth-Cozens, 1987; 1998). Hostility on the other hand is defined in terms of harassment, bullying and violence at work (Di Martino, 2003) emanating both from external sources (patients, relatives) as well as internal sources (supervisors, managers and colleagues). Stress as a dependent variable – response refers to strain, which is the physiological, psychological and/or behavioural deviation from an individual's healthy functioning in response to stressors (Cooper,

Dewe, and O'Driscoll, 2001), which in this study are job satisfaction and turnover intention.

Research consistently shows that higher levels of work stressors are associated with lower levels of job satisfaction and higher turnover intentions. Job satisfaction in this study is defined as “the extent to which people are satisfied with their work” (Warr, 2002, p. 1). Intention to leave on the other hand is defined as the anticipation of leaving one’s current position, current employer or health care profession (Mobley, Horner, and Hollingsworth, 1978). In Norway, Hetlevik and Hunskar (2004) report that job satisfaction is lower when general practitioners have waiting lists of more than three weeks and when they have full lists, factors that are indicative of heavy workload. Similar findings are found in US nursing homes where nursing aides consider workload as an important aspect that determines job satisfaction, which in turn impacts on turnover intentions (Castle, Engberg, Anderson, and Men, 2007). Various authors provide evidence that hostility in health care settings is increasing (Di Martino, 2003; Franz et al., 2010; Wiskow, Albrecht and De Pietro, 2010). LeBlanc and Kelloway (2002) identify different sources of aggression in the workplace arising both externally and internally to organizations. In our study, we are assessing hostility holistically as arising from two major sources, namely external hostility from patients and relatives and internal hostility from managers/supervisors and co-workers. LeBlanc and Kelloway (2002) report a direct link between violence in the workplace and turnover intentions. Against this background, we propose the second hypothesis namely,

**Hypothesis 2:** Quantitative overload and hostile environment have a negative association with staff job satisfaction, and a positive association with turnover intentions.



The proposed model projects stress as a stimulus-response relationship that takes into consideration the person-environment relationship, using the interactional model of stress (Dollard, 2002), namely the demand/control support (DCS) model (Karasek and Theorell, 1990). The role of decision latitude in the DCS model clarified earlier studies that could not explain a higher degree of job satisfaction in executives as compared to assembly-line workers, despite their higher qualitative job demands.

We posit that, in line with the DCS model (Karasek and Theorell, 1990), social support and job design buffer employees against high quantitative overload and hostility. Previous theory and research highlight the buffering hypotheses of social support and are mostly cross-sectional in design (Bliese and Castro, 2000; Peeters and Le Blanc, 2001; Van Der Doef, Maes, and Diekstra, 2000). We rely on the social support theory to explain how through positive social environments, employees cope with the negative effects of stressors. Our study tests the buffering hypothesis of social support in acute hospital practice and therefore, we propose the third hypothesis namely,

**Hypothesis 3:** Social support will moderate the relationships between work stressors (quantitative workload and hostility) and strains (job satisfaction and turnover intentions).

The underlying theory that supports job design as a moderator in the stressor-to-strain relationship is also the DCS-model, which predicts main effects in that both high work demands and low autonomy independently cause strain (de Jonge and Kompier, 1997; Van der Doef and Maes, 1999). The DCS-model also predicts interaction effects between work demands and autonomy, in that high work demands with low autonomy or low demands with high autonomy result into high strain (Peeters and Rutte, 2005). More recently, in a two-year panel longitudinal survey on health

workers in Holland, deJonge, van Vegchel, Shimazu, Schaufeli, and Dormann (2010) report that the association between job demands and job satisfaction is positive in the case of high job control, and negative in the case of low job control. Additionally, their study reports that the relation between job demands and psychosomatic health symptoms/sickness absence is negative in case of high job control and positive in case of low control. We therefore propose the fourth hypothesis, namely:

**Hypothesis 4:** Quality of job design will moderate the relationships between work stressors (quantitative workload and hostility) and strains (job satisfaction and turnover intentions).

#### METHOD

The number of questionnaires in the acute/specialist hospitals amounted to 138,214 questionnaires in acute hospitals and specialist acute hospitals across the UK. The response rate was 53%, which compared well with the average reported response rate of 52.7 percent for studies that utilized data collected from individuals and the average reported response rate of 35.7 percent for studies that utilized data collected from organizations (Baruch and Holtom, 2008). Therefore, the number of respondents amounted to 65,142. As regards, the age profile 28% and 30% lie in the 41–50 and 31–40 year age groups, respectively, whereas 81% are women and 19% are men. The occupational categories included management, all health-care professionals, administration, clerical and maintenance staff, with the highest being 28.4% registered nurses followed by 21.7% administration and clerical staff.

#### *Measures*

The items were taken from the UK NHS Staff Surveys (2004–2010) and for this investigation included measures for senior management leadership, social support, job design, quantitative overload, hostility, job satisfaction and turnover intentions.

*Quality of senior management leadership* (QSML) refers to the networking & achieving construct in leadership developed by Alimo-Metcalfe and Alban-Metcalfe (2001), which constitutes inspiring communication of the vision of the organization to a wide network of internal and external stakeholders; gains the confidence and support of various groups through sensitivity to needs, and by achieving organizational goals. A five-item measure adapted from the *Transformational Leadership Questionnaire* (Alimo-Metcalfe and Alban-Metcalfe, 2001) with three possible responses (yes/no/don't know) was used to assess the quality of senior management leadership. The main statement was: 'Senior management in my organization...' followed by five items, namely: 'a. ...set out a clear vision of where the organization is headed; b. ...support new ideas for improving services for patients; c. ...are focused on meeting patients' needs; d. ...build strong, positive relationships with the community; e. ...build strong, co-operative links with other organizations.' ( $\alpha = .81$ ). A one-item scale was developed from these five items with scores ranging from 1 to 5 depending on the 'yes' responses to each item.

*Social support* (SS) refers to a significant resource for health care employees at the workplace while facing work stressors. It is derived from the *Job Content Questionnaire* (JCQ) (Karasek et al., 1998), a self-administered tool used for psychosocial job assessment. This scale contained four items, and deals with both co-worker support (1 item) namely, 'How satisfied are you with the support you get from your colleagues' in a five point Likert scale ranging from very dissatisfied to very satisfied; and supervisor support (3 items) namely 'My supervisor... a. ...encourages those who work for her/him to work as a team; b. ...asks for my opinion before making decisions that affect my work; c. ...can be counted on to help me with a difficult task at work.' in a five point likert scale ranging from strongly disagree to

strongly agree ( $\alpha = .77$ ).

*Job design* (JD) scale contains five items ( $\alpha = .73$ ), which are adapted from the *Job Diagnostic Survey* (Hackman and Oldham, 1975). The five items are in response to the question 'To what extent do you agree with the following?' The responses range on a five-point scale from strongly disagree to strongly agree and the five items are: 'a. I am consulted about changes that affect my work; b. I often have trouble working out whether I am doing well or poorly in this job; c. I am involved in deciding on the changes introduced that effect my work area/team/department; d. I always know what my responsibilities are; e. I get clear feedback about how well I am doing my job.'

#### *Work stressors.*

Work stressors were measured using five dimensions: three dimensions that form the construct quantitative overload, and two dimensions that form the construct hostile environment. Quantitative overload (QO) was adapted from the studies carried out by Firth-Cozens (1987, 1998) and by Cox and Griffiths (1995). This was measured using: (a) working extra hours for which respondents had to choose from seven options from 0 hours per week to more than 25 hours per week. (b) Social pressures to work extra hours, which was developed into a scale from six dichotomous (yes/no) items in response to statement 'I work more than my contracted hours. . .', namely ' . . . because it is necessary to meet deadlines', 'because it is necessary to get ahead in my career', ' . . .because it is expected by my manager', ' . . .because it is expected by my colleagues', ' . . .because it is impossible to do my job if I don't', and ' . . .because I want to provide the best care I can for patients'. (c) Work pressure felt by staff, which had two 5-point Likert scale items, had a Cronbach's alpha of 0.77 and an inter-item correlation of 0.63. Respondents indicated the extent to which they agreed or disagreed with 'I cannot meet all the conflicting demands on my time at work' and

'I do not have time to carry out all my work'. Hostility (HO): External and internal hostility were developed into two separate scales from four dichotomous (yes/no) items, in response to the question 'In the past 12 months have you experienced physical violence and or harassment, bullying and abuse from any of the following?' This was adapted from the Fourth European Working Conditions Survey. (Official Publications of the European Communities, 2007). For external hostility, the items referred to patients and relatives whereas for internal hostility, the items referred to manager/supervisor and colleagues. The inter-item correlation between internal hostility and external hostility was 0.12. The underlying structure for work stressors was tested using split file analysis with exploratory factor analysis on the first half of the data identifying the two factors, namely quantitative overload and hostility. Confirmatory factor analysis (CFA) on the second half of the data, confirmed the underlying factor structure with good model fit indices, namely comparative fit index (CFI) = 0.96, which is above 0.95 and Tucker-Lewis Index (TLI) = 0.94, which is above the recommended 0.90 and Root Mean Square Error of Approximation (RMSEA) = 0.041, with 90% CI = 0.037 and 0.046, which is below the recommended value of 0.08 or less as indicating a reasonable error of approximation.

*Work strains.* Work strains were measured using two dimensions, namely job satisfaction and turnover intentions. Job satisfaction (JS) was adapted from the job satisfaction scale (Warr et al., 1979) and was measured using four items and has a Cronbach's alpha of 0.87 and an inter-item correlation ranging from 0.4 to 0.6. In answering the question 'How satisfied are you with each of the following areas of your job?', respondents indicated the extent to which they were satisfied or dissatisfied to five-point Likert scale items, namely 'The support I get from my immediate manager', 'The freedom I have to choose my own method of working',

‘The amount of responsibility I am given’, and ‘The extent to which my employer values my work’. The construct turnover intentions was measured using three items, For the assessment of the intention to quit (Intlve) we used a 3-item scale adapted from the scale by Mobley, Horner, and Hollingsworth (1978) with a Cronbach’s alpha of 0.92 and an inter-item correlation ranging from 0.7 to 0.8. In answering the question ‘To what extent do you agree with the following?’, respondents indicated the extent to which they agreed or disagreed to three five-point Likert scale items, namely ‘I often think about leaving my current employer’, ‘I will probably look for a new job in the next year’, and ‘As soon as I can find another job, I will leave my current employer’. Exploratory factor analysis using maximum likelihood was carried out on half of the data using the nine items as measures of the theoretically derived construct strains. This clearly showed two factors: identified as job satisfaction and turnover intentions, with six and three manifest variables strongly loading on the two factors respectively. CFA on the second half of the data confirmed the underlying factor structure with good model fit indices, namely CFI = 0.973, TLI = 0.95 and RMSEA = 0.067, with 90% CI of 0.064 and 0.073.

### *Analyses*

The analysis was conducted in two stages to test the five hypotheses. SPSS 17 and AMOS 16.0 (Analysis of Moment structures) software packages (Arbuckle, 2009) were used. The data was tested for multivariate normality. Mardia’s measure of multivariate normality based on skewness and kurtosis is 40.35 ( $p < 0.05$ ), which means significant non-normality. In very large sample sizes, violation of normality assumption is expected and Maximum Likelihood is shown to be robust with sample sizes of few hundred (Kupek, 2002). Therefore, non-normality in this study should

not have an impact on the analyses and results considering the very large sample sizes as well as with the use of the robust maximum likelihood estimation.

The first stage used a structural equation-modelling design to test two parts of the model namely the relationship between senior management leadership with social support and job design, and the stressor-to-strain relationships. The second stage involved testing for moderation using regression analysis. Moderated multiple regression (Baron and Kenny, 1986; Cohen, Cohen, West, and Aiken, 2003) analyses were conducted to examine the hypothesized moderated relationships. Subsets were entered into hierarchical regressions of (1) demographic control variables namely age, gender and occupational group (2) quantitative overload and hostility as independent variables and, social support and job design as moderators (3) two-way interactions between independent variables and moderators.

## RESULTS

Table 1 presents the descriptive statistics and correlations among study variables.

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### ***Quality of senior management leadership, social support and job design***

Quality of senior management leadership was positively related to social support ( $r = .33$ ) and job design ( $r = .37$ ) at  $p < 0.01$  (Table I). Quality of senior management leadership explained 75% and 94% of the variance of social support and job design respectively. In other words, the error variance of social support is approximately 25% of the variance of social support itself, whereas the error variance of job design is only 6% of the variance of job design itself. The hypothesised model was tested against various models (Table II). The test indicates a significant model improvement

for the hypothesised model over the null model and the two-factor (perfectly correlated) model suggesting that the hypothesised model fits the data better. The first hypothesis, namely that quality of senior management leadership is associated with social support and quality of job design has been supported.

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***Work stressor-to-strain relationships***

Quantitative overload was negatively associated with job satisfaction ( $r = -.14$ ) and positively associated with turnover intention ( $r = .16$ ) at  $p < 0.01$ . Hostility was negatively associated with job satisfaction ( $r = -.25$ ) and positively associated with turnover intention ( $r = .22$ ) at  $p < 0.01$  (Table 1). These results support hypothesis 2. Additionally, in line with previous studies, there is also a negative correlation between job satisfaction and staff turnover intention ( $r = -.54$ ) at  $p < 0.01$ .

The hypothesised model was tested against other models (Table III). The test indicates that the best fit was obtained by the four-factor correlated measurement model. However, the model fit statistics of the hypothesised model were acceptable and there was a significant model improvement for the hypothesised model over the null model and the perfectly correlated four-factor model, suggesting that the hypothesised model fits the data well.

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The second hypothesis, namely that quantitative overload and hostile environment (external and internal hostility) are associated with staff job satisfaction, and turnover intentions, has been supported. Table IV shows the models' total effects, standardised



effects and squared multiple correlations. The total effect of one variable on another represents the average amount of change in the dependent variable for a single raw score unit increase in the predictor variable. Therefore as shown in Table IV, when raw total score of ‘work stressors’ goes up by 1, the raw score of ‘strains’ goes up by 1.15. However, it is imperative to also show the standardized total effects, which represent the average amount of change in the dependent variable in standard deviations, given a standard deviation unit change in the predictor variable. Table IV shows that when ‘work stressors’ goes up by 1 standard deviation, ‘strains’ goes up by 0.715 standard deviations. Squared multiple correlation represents the proportion of variance in the dependent variable that is explained by the collective set of predictors. As Table IV shows, quality of senior management leadership explained 0.750 and 0.940 of the variance of social support and job design respectively. Work stressors explained 0.314 of the variance of quantitative overload and 0.247 of the variance of hostility. Strains explained 0.576 of the variance of job satisfaction and 0.712 of the variance of turnover intention. Work stressors explained 0.512 of the variance of strains.

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 Insert Table IV  
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***Social support and job design as moderators of the stressor-to-strain relationships***

The first analysis dealt with social support as moderator (Table V). After controlling for demographic variables, the results showed that quantitative overload and social support together predicted a significant portion of the variance of job satisfaction ( $R^2 = .476, p < .001$ ) and staff turnover intention ( $R^2 = .187, p < .001$ ). Similarly hostility and social support predicted a significant portion of the variance for job satisfaction ( $R^2 = .483, p < .001$ ) and staff turnover intention ( $R^2 = .193, p <$

.001). To test whether the moderator hypothesis holds, the two-way interaction terms were entered in the next step. All interaction terms were significant for ( $\Delta R^2 = .001$ -.002,  $p < .001$ ) except for hostility\*social support on turnover intentions.

The second analysis dealt with job design as moderator. After controlling for demographic variables, quantitative overload and job design together predicted a significant portion of the variance in job satisfaction ( $R^2 = .416$ ,  $p < .001$ ) and staff turnover intention ( $R^2 = .220$ ,  $p < .001$ ). Similarly hostility and job design predicted a significant portion of the variance for job satisfaction ( $R^2 = .424$ ,  $p < .001$ ) and staff turnover intention ( $R^2 = .223$ ,  $p < .001$ ). When the two-way interaction terms were entered, these were all significant ( $\Delta R^2 = .001$  - .002,  $p < .001$ ). In view of the small ( $\Delta R^2$ ), despite the statistical significance, this would translate into small effects in terms of practical significance. Therefore, there is partial support for hypotheses 3 and 4.

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 Insert Table V, VI, VII, VIII  
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## DISCUSSION

The proposed model was by and large supported and the results threw light on the ambiguity of the impact of senior management leadership within organizations on the level of social support and job design and how these effects through main effects and moderation, translated into more satisfied workforce and with lower turnover intentions. This study had several limitations. The cross-sectional nature of the study provided a threat to internal validity of indistinct temporal order of occurrence, which prevented us from asserting the direction of causality. Although in structural equation modelling terms, we referred to the models as causal models, one could only claim that the models fitted the data and that the acceptable model fit-statistics increased our

confidence of having correctly predicted the patterning of observed associational relations. The conclusions would have been stronger with the use of a three-or-more-wave panel study data, although even in such studies, failing to consider alternative variables that would account for the observed relations would invalidate any causal conclusions (Biddle and Marlin, 1978; Markus, 2010). The use of self-report data in this study highlighted the problem of percept-percept bias (Crampton and Wagner, 1994), which is specifically associated with single source data collection. Another important limitation is that although the study has been carried out nationwide in the UK, any generalization of the results to other countries should take into account cultural differences and variations in health systems, as both these factors could have an impact on the respondents when answering the questionnaire. Therefore, it would be of benefit to validate the model in other countries. Finally, the strength of this study lies in the huge sample size of 65,142 respondents, which is neither common nor easy to achieve. However, one must point out that although a response rate of 53% is considered acceptable in organizational research, non-respondents may have possessed greater intentions to quit, lower levels of job satisfaction, and satisfaction with senior management leaders and supervisors than respondents as indeed reported by Rogelberg et al. (2000). A deeper analysis of the non-respondents would have surely contributed to the findings.

This study provides several results that have theoretical and practical implications. The consideration of senior management leadership as a potential contributor to social support and job design is an important consideration. The responsibilities that fall under senior management leadership in health care are three-fold with practical implications on the work environment. Firstly, they set direction, produce ideas, convey new ideologies, and guide quality-improvement efforts

(Glickman *et al.*, 2007). Secondly, they must ensure that strategically, the employees fit in well within their organizations. Thirdly, senior management leaders must minimise their employees' experience of job stress through their influence on determining physical safety, psychosocial environment and healthy lifestyle practices (Kelloway, Teed, and Prosser, 2008).

Additionally, this study explains major variances in the main effects of work stressors with strains, as well as, moderators with strains. By matching quantitative workload with job design, and ensuring a hostile-free environment, employees are less likely to suffer from strains. Likewise, providing adequate social support, while ensuring an efficient job design, will result into more satisfied staff.

Finally, with regard to the moderator hypothesis of the stressor-strain relationships, the study shows statistical significant results for the interaction terms. Despite the partial support of the buffering hypotheses, this study provides the right basis for further exploration of the impact that social support and job design may have on the stressor-strain relationships experienced by employees. Every little step towards potentially preserving the well-being of employees particularly within hospital settings is worth pursuing.

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TABLE I  
Means, standard deviations and inter-correlations among study variables

Variable	Mean	SD	Range	1	2	3	4	5	6
1. Quality of senior management leadership	2.20	1.89	1-5	1					
2. Social support	3.50	.82	1-5	.33(**)	1				
3. Job design	3.22	.77	1-5	.37(**)	.71(**)	1			
4. Quantitative overload	2.34	.92	1-6	.00	-.10(**)	-.11(**)	1		
5. Hostility	.41	.62	1-4	-.07(*)	-.19(**)	-.17(**)	.18(**)	1	
6. Job satisfaction	3.42	.81	1-5	.34(**)	.74(**)	.68(**)	-.14(**)	-.25(**)	1
7. Staff turnover intentions	2.63	1.10	1-5	-.25(**)	-.45(**)	-.44(**)	.16(**)	.22(**)	-.54(**)

\*\* Correlation is significant at the 0.01 level (2-tailed) \* Correlation is significant at the 0.05 level (2-tailed).

TABLE II

Model fit indices of the model (quality of senior management leadership predicting social support and job design) over the two-factor measurement models

	$\chi^2$	<i>df</i>	CFI	TLI Rho2	RMSEA (LO 90, HI 90)	Chi-square/ <i>df</i>
Null model	188963.90	55			0.230 (0.229, 0.230)	3435.71
Two-factor measurement model <sup>a</sup> (Perfectly correlated)	38392.78	27	0.79	0.65	0.148 (0.146, 0.149)	1421.96
Two-factor measurement model <sup>b</sup> (Correlated)	9749.50	26	0.95	0.91	0.076 (0.075, 0.077)	374.98
Hypothesised model <sup>c</sup>	9913.70	33	0.95	0.91	0.068 (0.067, 0.069)	300.41

N=65,142; CFI- Comparative fit index; TLI= Tucker Lewis index; RMSEA = Root mean square error of approximation; *df*= Degrees of freedom.

<sup>a</sup> Difference two-factor model(Perfectly correlated) and null model:  $\Delta \chi^2$  (*df*)= 150571.12(28)\*\*\*

<sup>b</sup> Difference between two-factor(Perfectly correlated) and two-factor measurement (Correlated)models:  $\Delta \chi^2$  (*df*)=28643.28(1)\*\*\*

<sup>c</sup> Difference between hypothesised and two-factor measurement (Correlated) models:  $\Delta \chi^2$  (*df*)=164.2(7)\*\*\* Difference between hypothesised and two-factor measurement (Perfectly correlated) models:  $\Delta \chi^2$  (*df*) =28479.08(6) \*\*\*

\*\*\* p<.001

TABLE III

Model fit indices of the model (work stressors-to-strains) over the four-factor measurement model

	$\chi^2$	<i>df</i>	CFI	TLI Rho2	RMSEA (LO 90, HI 90)	Chi-square/ <i>df</i>
Null model	260648.79	78			0.226 (0.226, 0.227)	3341.65
Four-factor measurement model (perfectly correlated) <sup>a</sup>	93110.15	54	0.64	0.49	0.163 (0.162, 0.164)	1724.26
Four-factor measurement model (correlated) <sup>b</sup>	10760.60	48	0.96	0.93	0.059 (0.058, 0.059)	224.18
Hypothesised model <sup>c</sup>	14141.60	52	0.95	0.92	0.064 (0.064, 0.065)	271.95

N=65,142; CFI- Comparative fit index; TLI= Tucker Lewis index; RMSEA = Root mean square error of approximation; *df*= Degrees of freedom. \*\*\*  $p < .001$

<sup>a</sup> Difference four-factor (perfectly correlated) and null model:  $\Delta \chi^2$  (*df*)= 167538.64(24)\*\*\*

<sup>b</sup> Difference four-factor (correlated) and four-factor (perfectly correlated) model:  $\Delta \chi^2$  (*df*)=823945.55(8)\*\*\*

<sup>c</sup> Difference four-factor (correlated) and hypothesised model:  $\Delta \chi^2$  (*df*)=3381(4)\*\*\*

Difference four-factor (perfectly correlated) and hypothesised model:  $\Delta \chi^2$  (*df*)=789868.55(2) \*\*\*

TABLE IV  
Total Effects, Standardised total effects, and squared multiple correlations

	Job Design	Social Support	Quantitative Overload	Hostility	Job Satisfaction	Staff Turnover intention	Strains
Total Effects	.766	.372	1.000	.847	-1.364	1.840	1.15
Standardised Total Effects	.972	.856	.560	.497	-.600	.667	0.715
Squared Multiple Correlations	.940	.750	.314	.247	.576	.712	0.512

TABLE V

Summary of moderated regression analysis - quantitative overload as independent variable and social support as moderator, predicting job satisfaction and turnover intentions.

Step	Variable	Job satisfaction				Staff turnover intentions			
		B	SE B	$\beta$	t	B	SE B	$\beta$	t
1	Age	.030	.004	.040	8.654*	-.175	.005	-.168	-36.331*
	Gender	.086	.008	.042	10.332*	-.114	.011	-.041	-9.978*
	Occupational group	.006	.001	.023	5.033*	-.002	.002	-.005	-1.331
	Length of service in organization	-.035	.002	-.073	-15.78*	.033	.003	.051	10.985*
	$\Delta R^2$		.006*				.024*		
2	Quantitative overload	-.062	.002	-.077	-25.822*	.132	.004	.118	31.857*
	Social support	.557	.002	.684	233.447*	-.459	.004	-.410	-112.419*
	$\Delta R^2$		.476*				.187*		
3	Quantitative overload x Social support	.035	.002	.046	15.676*	-.034	.004	-.032	-8.879*
	$\Delta R^2$		.002*				.001*		
	F Change		245.727*				78.843*		
	Total $R^2$		.485				.212		

\*  $p < .001$ , two-tailed.

TABLE VI

Summary of moderated regression analysis - hostility as independent variable and social support as moderator, predicting job satisfaction and turnover intentions.

Step	Variable	Job satisfaction				Staff turnover intentions			
		B	SE B	$\beta$	t	B	SE B	$\beta$	t
1	Age	.030	.004	.039	8.451*	-.174	.005	-.168	-36.258*
	Gender	.086	.008	.042	10.296*	-.113	.011	-.040	-9.956*
	Occupational group	.006	.001	.022	5.370*	-.002	.002	-.005	-1.284
	Length of service in organization	-.034	.002	-.072	-15.494*	.033	.003	.051	10.960*
	$\Delta R^2$		.006*					.024*	
2	Hostility	-.099	.002	-.123	-40.232*	.160	.004	.146	38.307*
	Social support	.543	.002	.667	224.727*	-.440	.004	-.393	-106.382*
	$\Delta R^2$		.483*					.193*	
3	Hostility x Social support	.012	.002	.017	5.650*	-.005	.004	-.005	-1.220
	$\Delta R^2$		.001*					.000	
	F Change		31.924*					1.488	
	Total $R^2$		.490					.217	

\*  $p < .001$ , two-tailed.

TABLE VII

Summary of moderated regression analysis - quantitative overload as independent variable and job design as moderator, predicting job satisfaction and turnover intentions.

Step	Variable	Job satisfaction				Staff turnover intentions			
		B	SE B	$\beta$	t	B	SE B	$\beta$	t
1	Age	.030	.004	.040	8.673*	-.175	.005	-.168	-36.330*
	Gender	.086	.008	.042	10.310*	-.114	.011	-.041	-9.982*
	Occupational group	.006	.001	.021	5.041*	-.002	.002	-.005	-1.305
	Length of service in organization	-.035	.002	-.073	-15.755*	.033	.003	.051	10.976*
	$\Delta R^2$		.006*					.024*	
2	Quantitative overload	-.067	.003	-.083	-26.346*	.128	.004	.115	31.587*
	Job design	.521	.003	.637	206.288*	-.503	.004	-.448	-125.519*
	$\Delta R^2$		.416*					.220*	
3	Quantitative overload x Job design	.010	.002	.016	5.191*	-.034	.004	-.040	-10.964*
	$\Delta R^2$		.001*					.002*	
	F Change		26.948*					120.210*	
	Total $R^2$		.423					.245	

\*  $p < .001$ , two-tailed.



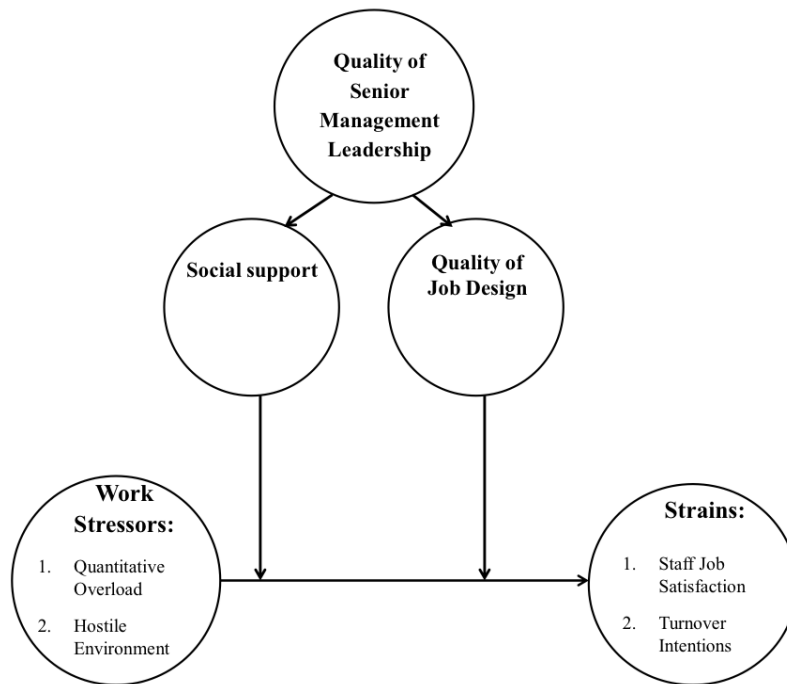
TABLE VIII

Summary of moderated regression analysis - hostility as independent variable and job design as moderator, predicting job satisfaction and intention to leave job.

Step	Variable	Job satisfaction				Staff turnover intentions			
		B	SE B	$\beta$	t	B	SE B	$\beta$	t
1	Age	.030	.004	.040	8.507*	-.174	.005	-.168	-36.256*
	Gender	.086	.008	.042	10.299*	-.114	.011	-.040	-9.960*
	Occupational group	.006	.001	.022	5.354*	-.002	.002	-.005	-1.259
	Length of service in organization	-.034	.002	-.072	-15.489*	.033	.003	.051	10.952*
	$\Delta R^2$		.006*				.024*		
2	Hostility	-.099	.003	-.124	-38.151*	.145	.004	.132	35.199*
	Job design	.505	.003	.619	196.934*	-.484	.004	-.393	-118.865*
	$\Delta R^2$		.424*				.223*		
3	Hostility x Job design	.017	.002	.027	8.617*	-.043	.003	-.050	-13.816*
	$\Delta R^2$		.001*				.002*		
	F Change		74.251*				190.883*		
	Total $R^2$		.431				.249		

\*  $p < .001$ , two-tailed.

Figure 1. Hypothesised model



Leadership, support, job design, stress