

HSE Management Standards and stress-related work outcomes

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Background	The UK Health and Safety Executive's (HSE) Management Standards (MS) approach has been developed to help organizations manage potential sources of work-related stress. Although there is general support for the assessment model adopted by this approach, to date, there has been no empirical investigation of the relationship between the actual MS (as measured by the final revised version of the HSE Indicator Tool) and stress-related work outcomes.
Aims	To investigate the relationship between the HSE MS and the following stress-related work outcomes: 'job satisfaction', job-related anxiety and depression and errors/near misses.
Methods	An anonymous cross-sectional questionnaire was distributed by either e-mail or post to all employees within a community-based Health and Social Services Trust. Respondents completed the HSE Indicator Tool, a job-related anxiety and depression scale, a job satisfaction scale and an aggregated measure of the number of errors/near misses witnessed. Associations between the HSE Indicator Tool responses and stress-related work outcomes were analysed with regression statistics.
Results	A total of 707 employees completed the questionnaire, representing a low response rate of 29%. Controlling for age, gender and contract type, the HSE MS (as measured by the HSE Indicator Tool) were positively associated with job satisfaction and negatively associated with 'job-related anxiety', 'job-related depression' and 'witnessed errors/near misses'.
Conclusions	This study provides empirical evidence to support the use of the MS approach in tackling workplace stress.
Key words	HSE Management Standards; job satisfaction; job-related anxiety and depression; stress; witnessed errors/near misses.

Introduction

It is widely acknowledged that work-related stress can lead to increased sickness absence, higher labour turnover and early retirement [1]. Indeed, between 2007 and 2008, an estimated 13.5 million working days were lost to stress-related absence [2]. The Management Standards (MS) were developed by the UK Health and Safety Executive (HSE) to help reduce the levels of work-related stress reported by British workers [3]. This standards-based approach highlights six key areas of work design that, if not properly managed, are associated with poor health and well-being, lower productivity and increased sickness absence [4,5]. The MS are:

- Demands (including issues such as workload, work patterns and the working environment);
- Control (how much say the person has in the way they do their work);
- Support (which includes the encouragement and resources provided by the organisation, line management and colleagues);
- Relationships at work (which includes promoting positive working practices to avoid conflict and dealing with unacceptable behaviour);
- Role (whether people understand their role within the organization and whether the organisation ensures that the person does not have conflicting roles);
- Change (how organizational change is managed and communicated).

The 'Indicator Tool', a 35-item survey containing seven subscales, was created to capture an organization's performance against the six MS. Cousins *et al.* [4] provide a detailed discussion of the development of this tool plus evidence of its validity and reliability.

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In light of the HSE's focus on enabling organisations to effectively tackle work-related stress using the MS approach [3,4], one would expect a relationship to exist between the MS (as measured by the Indicator Tool) and actual indicators of work-related stress. It is perhaps surprising that there has been only one study to date that has investigated the relationship between the MS and stress-related work outcomes. Using a pilot version of the Indicator Tool, Main *et al.* [6] found a weak association between the MS and job satisfaction, sickness absence and job performance among occupational health and human resource employees. The present study is the first empirical investigation of the relationship between the MS, as measured by the final revised version of the HSE Indicator Tool, and the stress-related work outcomes of 'job satisfaction', job-related anxiety and depression and 'witnessed errors/near misses'.

Methods

Observing the HSE guidelines in deploying and using the Indicator Tool [7], a cross-sectional survey was distributed to 2461 employees of a community-based Health and Social Services Trust. The primary distribution method was through e-mail (~85%). A paper version of the questionnaire alongside a covering letter was posted to the home of any staff without an active email account (~15%). Publicity for the survey included an advertisement on the trust intranet, a poster campaign, two communications issued through team core briefings and a reminder attached to employee payslips. The survey remained open for ~4 weeks. Managers were instructed to give time to the staff to complete the survey at work. A prize draw for £50 worth of shopping vouchers was offered as an incentive for those staff who wished to enter the survey. Surveys were anonymously returned, either electronically or by mail, to an external contractor for processing.

The cross-sectional survey consisted of three demographic questions investigating gender, age and contract type followed by the HSE Indicator Tool and scales investigating job-related anxiety and depression, job satisfaction and the number of errors/near misses witnessed. The six MS were measured by the 35-item Indicator Tool which included seven subscales: 'demands', 'control', 'relationships', 'role', 'change', 'managers' support' and 'peer support'. Two response scales were used within the tool: a five-point Likert-type scale and a five-point frequency scale. Research has provided empirical support for the factor structure and scale reliability of the Indicator Tool [4,8].

Job-related anxiety and depression was measured using the job-related well-being scale developed by Warr [9]. This scale consists of two three-item subscales measuring 'job-related depression' and 'job-related anxiety'. Both

scales use a Likert-type response format and have demonstrated acceptable reliability and validity [10].

Job satisfaction was measured using a seven-item Likert-type scale developed for the National Health Service (NHS) national survey [11]. Acceptable internal reliability (Cronbach's $\alpha = 0.87$), inter-rater reliability (ICC(2) = 0.92) and discriminant validity for this measure have been reported [11].

The witnessed errors/near misses scale was also adapted from the NHS national survey [11]. This aggregated two-item scale measured the number of errors/near misses witnessed by each individual in the previous month that could potentially harm patients (one item) and staff (one item). Although this scale has demonstrated psychometric reliability (Cronbach's $\alpha = 0.72$) [11], it is acknowledged that it may be prone to response bias due to personal and cultural influences [12]. For example, a high reporting rate may indicate an organizational culture committed to identifying and reducing errors rather than a truly high rate [13]. Despite these limitations, witnessed error/near misses reporting systems can identify errors and adverse incidents not found by other means [12].

The analyses were performed using SPSS for Windows 15.0 (SPSS Inc., Chicago, IL, USA) software. Correlational analyses were conducted to examine the bivariate relationships between the research variables. This was followed by hierarchical multiple regression analyses examining the variance explained in each dependent variable (i.e. job satisfaction, job-related anxiety, job-related depression and witnessed errors/near misses) by the independent variables (Indicator Tool subscale scores), controlling for 'age', 'gender' and 'contract type'.

Results

A total of 707 employees completed and returned the survey, reflecting a low response rate of 29%. Comparison of the characteristics of the responders with all employees within the trust showed no significant differences (Table 1). Potential non-response bias was investigated by comparing early and late respondents. Subjects who required more reminders before they participated were non-respondents if the data collection had stopped earlier. Therefore, late respondents were used as a proxy for non-respondents in estimating non-response bias [14]. Table 2 displays means, standard deviations and Mann-Whitney U-test results comparing the first 50 responses received with the final 50 responses against each of the measures under investigation. These results indicated there was no significant difference between the early and late responders for any of the measures under investigation.

The majority of respondents were aged between 41 and 50 years ($n = 247$). Permanent full-time employees

Table 1. Comparison of respondents' socio-demographic and socio-economic characteristics with HSS Trust as a whole (data are percentages)

	Respondents (%)	Total staff in post (%)
Gender		
Male	19	18
Female	81	82
Age group		
16–20	2	2
21–30	18	14
31–40	23	27
41–50	35	36
51–65	22	21
66+	0	0
Contract		
Full-time	66	63
Part-time	29	30
Temporary	4	7
Not stated	1	0
Occupational group		
Administrative and clerical	37	26
Works and maintenance	0	1
Nursing and midwifery	23	35
Social services	24	26
Professional and technical	12	9
Medical	1	3
Not stated	3	0

Table 2. Comparison of early and late responders

Measure	First 50 responses Mean (SD)	Last 50 responses Mean (SD)	Mann–Whitney U-value ^a
Demands	3.3 (0.7)	3.4 (0.7)	1111.5
Control	3.3 (0.9)	3.4 (0.8)	1119.5
Managers' support	3.6 (1.0)	3.7 (1.0)	1211.5
Peer support	4.0 (0.8)	4.0 (0.8)	1180.5
Relationships	3.9 (0.9)	4.1 (0.8)	1084.0
Role	4.3 (0.7)	4.4 (0.6)	1161.5
Change	3.2 (0.9)	3.4 (1.0)	1139.5
Job satisfaction	3.6 (0.7)	3.6 (0.9)	1126.0
Job-related anxiety	1.4 (0.5)	1.4 (0.5)	1131.0
Job-related depression	1.7 (0.9)	1.8 (1.1)	1157.0
Errors/near misses	2.4 (1.0)	2.5 (1.0)	1100.0

^aSignificance test of Mann–Whitney U-tests for rank differences.* $P < 0.05$.

constituted 67% ($n = 473$) of the participants; however, part-time and temporary contract types were also well represented. Although the sample comprised a range of staff from various occupational groups, administrative and clerical ($n = 260$), nursing and midwifery ($n = 151$) and social services ($n = 174$) together comprised 83% of the response base.

Descriptive statistics for each of the variables are given in Table 3, which includes means, standard deviations,

correlations and Cronbach's alpha reliability values for each of the variables measured. Table 3 shows that the alpha reliabilities for the seven subscales ranged from 0.78 to 0.92, consistent with previous research findings [4,8]. All seven subscales of the Indicator Tool displayed a significant relationship with the stress-related outcomes under investigation.

The relationships were further investigated using multiple regression analyses. The control variables were gender, age and contract type. The Indicator Tool subscale scores formed the independent variables with job satisfaction, job-related depression, job-related anxiety and the witnessed errors/near misses acting as interchangeable dependent variables. The control variables were entered into a regression model predicting each independent variable (Step 1), followed by the seven subscales of the Indicator Tool (Step 2). The results are displayed in Table 4.

At Step 1, none of the regression models significantly predicted any of the variance in the stress-related work outcomes. At Step 2, the seven subscales of the HSE Indicator Tool accounted for 67% of the variance in job satisfaction ($P < 0.001$), 36% of the variance in job-related anxiety ($P < 0.001$), 28% of the variance in job-related depression ($P < 0.001$) and 18% of the variance in the 'errors and incidents' variable ($P < 0.001$).

All subscales, bar demands, displayed a significant association with job satisfaction. The managers' support subscale displayed the strongest association ($B = 0.45$, $P < 0.001$). Job-related anxiety displayed significant associations with the demands, relationships, change and role subscales. Job-related depression displayed a similar pattern of relationships but was also associated with the managers' support subscale. The witnessed errors/near misses scale displayed a significant negative association with the relationships ($P < 0.001$) subscale, as well as weaker negative associations with the demands, control and managers' support subscales. Curiously, a small positive relationship was found between peer support ($B = 0.12$, $P < 0.05$) and witnessed errors/near misses.

Discussion

The principal finding of our study is that the HSE MS (as measured by the HSE Indicator Tool) are positively associated with job satisfaction and negatively associated with job-related anxiety, job-related depression and witnessed errors/near misses.

The strength of our study lies in the fact that this is the first study to examine the association between the final revised version of the HSE MS Indicator Tool and stress-related work outcomes. These findings are consistent with prior research indicating a positive relationship between aspects of the MS (e.g. change and role) and mental health [15]. Previous research findings would lead us to expect the strongest relationships to exist between

Table 3. Correlations

	Demands	Control	Managers' support	Peer support	Relationships	Role	Change	Job satisfaction	Job-related anxiety	Job-related depression	Errors and incidents
Demands	(0.82)										
Control	0.19***	(0.78)									
Managers' support	0.28***	0.36***	(0.88)								
Peer support	0.24***	0.28***	0.52***	(0.84)							
Relationships	0.38***	0.31***	0.40***	0.44***	(0.78)						
Role	0.25***	0.31***	0.47***	0.33***	0.29***	(0.80)					
Change	0.28***	0.41***	0.71***	0.42***	0.36***	0.51***	(0.79)				
Job satisfaction	0.34***	0.50***	0.75***	0.52***	0.52***	0.47***	0.65***	(0.88)			
Job-related anxiety	-0.51***	-0.19***	-0.33***	-0.25***	-0.46***	-0.32***	-0.36***	-0.45***	(0.84)		
Job-related depression	-0.34***	-0.22***	-0.39***	-0.29***	-0.44***	-0.32***	-0.39***	-0.50***	0.76***	(0.92)	
Errors/near misses	-0.25***	-0.24***	-0.22***	-0.14**	-0.38***	-0.19***	-0.17***	-0.29***	0.34***	0.34***	(0.82)

Alpha reliability coefficients are given in parenthesis. Pearson's correlation coefficient was used.

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Table 4. Multiple regression analyses predicting commonly associated negative outcomes of work-related stress^a

Predictors	Job satisfaction		Job-related anxiety		Job-related depression		Errors/near misses	
	1	2	1	2	1	2	1	2
Step 1								
Gender	0.03	0.03	-0.03	-0.002	-0.07	-0.03	-0.09	-0.07
Age	0.01	0.00	0.04	0.03	0.00	-0.01	0.03	0.02
Contract type	0.00	0.00	-0.08	-0.03	-0.07	-0.04	-0.03	-0.02
Step 2								
Demands		0.05		-0.34***		-0.15***		-0.12**
Control		0.19***		0.03		0.02		-0.13**
Managers' support		0.45***		0.01		-0.12*		-0.12*
Peer support		0.07*		0.06		0.01		0.09*
Relationships		0.18***		-0.29***		-0.28***		-0.32***
Role		0.07**		-0.13**		-0.09*		0.06
Change		0.10**		-0.12**		-0.12*		0.05
Summary statistics ^b								
Multiple R	0.04	0.82	0.08	0.61	0.07	0.54	0.01	0.43
Adjusted R ²	0.00	0.67	0.00	0.36	0.00	0.28	0.01	0.18
F	1.24	170.27***	3.77	47.93***	3.30	34.37***	6.16	19.23***

^aEntries are standardized beta weights from full models.

^bEntries are for full model.

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

the 'job content' MS (i.e. demands, control and support) and ill-health outcomes [5,16]. Although demands displayed a significant negative relationship with both job-related anxiety and job-related depression, control and peer support displayed no significant associations and managers' support only displayed a modest relationship with job-related depression ($P < 0.05$). These findings contrast with previous research indicating a negative

relationship between employee mental health and low levels of job control [17,18] and a lack of social support [17]. Interestingly, this study found that the 'job context' MS (i.e. role, 'relationships' and change) displayed a more consistent negative relationship with the ill-health measures.

Although consistent with previous research findings [6,9,19], the scale of the relationship found between

the MS and job satisfaction was surprising. One would expect a greater degree of association to exist between the MS and measures relating specifically to stress-related outcomes (e.g. job-related anxiety and job-related depression). Reflecting previous research findings, employee perceptions of manager support (managers' support) had a significant impact on their job satisfaction [19,20].

Our findings in relation to witnessed errors/near misses are generally consistent with prior research linking occupational stress with accidents [21,22] and injuries [23]. However, we did find a small positive relationship with peer support. As previously mentioned, due to the strong influence of cultural variables on accident and incident reporting [12,13], this measure is prone to response bias. It may be that respondents working in a supportive environment feel more able to report errors/near misses. Although this inherent degree of measurement error must lead to cautious interpretations of the results, the overall findings do enrich our understanding of the impact of the HSE MS within the workplace.

A serious limitation of the study was the low response rate (29%). Although the response rate is comparable to previous trust surveys (22.5% in 2001 and 30% in 1998), low response rates can impact on the validity of any research findings [24]. Applicable guidelines that existed at that time were followed; however, as the survey was not the national NHS survey required of trusts in England, the more comprehensive NHS Staff Survey Guidance notes were not operationally adhered to [25]. The adoption of these guidelines may facilitate higher response rates in the future. For example, although the survey was promoted through multiple communication methods, no e-mail reminders were sent. Cook *et al.* [26] argue that response representativeness is more important than response rate. Comparison of the socio-demographic and socio-economic characteristics of our sample with everyone employed by the trust confirmed that there were no statistically significant differences with respect to gender, age, contract type and occupational group (Table 1). Comparison of the early responders with the late responders (Table 2) further suggested a potentially low level of non-response bias. Although tests of non-response bias are often far from conclusive [25,26], researchers should be cautious in ignoring survey results with low response rates without clear detailed information indicating a response bias is present [14].

Another limitation is the use of cross-sectional studies which run the risk that negative affectivity may artificially inflate associations between self-report measures. However, as all the research variables relate to the employees' emotional states, attitudes or perceptions, these variables are difficult to measure using an alternative method [27]; hence, reliance on self-report measures is necessary. Crampton and Wagner's [28] meta-review of over 500 research articles questioned the validity of the general con-

demnation of self-report measures. Furthermore, it has been suggested that evidence of meaningful inflation of results due to common method variance may be the exception rather than the rule [29].

By demonstrating a clear association between the HSE MS and stress-related outcomes, this study provides useful findings for clinicians and policy makers. For example this study suggests that the promotion of positive working practices to avoid conflict, and dealing with unacceptable behaviour, is associated with the level of job-related anxiety and job-related depression employees may experience.

Due to the barriers of practicality and feasibility, there is a distinct lack of longitudinal research investigating the issue of occupational stress [4]. Although a cross-sectional survey can determine an association between variables, it cannot determine causality. Without understanding causation, it is difficult to determine whether or not interventions targeting the MS will actually lead to a reduction in stress-related outcomes [30]. Further longitudinal investigations should be carried out to determine causation between the MS and stress-related work outcomes.

To conclude, the HSE MS approach relies substantially, although not exclusively, on a 35-item Indicator Tool for deciding who might be harmed and how to guide focus group consultations with employees and for evaluating the effectiveness of solutions implemented. This paper provides the first empirical evidence that higher MS ratings (as measured by the final revised version of the Indicator Tool) are associated with increased job satisfaction, decreased job-related anxiety and depression and lower witnessed errors/near misses. These findings lend further credibility to the use of the HSE MS Indicator Tool to help organizations manage potential sources of work-related stress.

Key points

- The HSE Management Standards Indicator Tool demonstrated acceptable levels of reliability.
- The HSE Management Standards (as measured by the Indicator Tool) were positively related to job satisfaction.
- The HSE Management Standards (as measured by the Indicator Tool) were negatively related to job-related anxiety and job-related depression and the number of witnessed errors/near misses.

Conflict of interest

None declared.

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