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The Management Standards Indicator Tool and the Estimation of Risk**Abstract:**

Background: The Health & Safety Executive's (HSE) Indicator Tool offers a measure of exposure to psychosocial work conditions that may be linked to stress-related outcomes. The HSE recommends that Indicator Tool data should be used as a basis for discussions concerned with the identification of psychosocial work conditions that might warrant prioritisation for intervention. However, operational constraints may render discussions difficult to convene and, when they do take place, the absence of information on harms associated with exposures can make it difficult to identify intervention priorities.

Aims: To examine (1) the utility of the Indicator Tool for the identification of a manageable number of psychosocial work conditions as intervention candidates and (2) whether administration of a measure of stress-related outcomes alongside the Indicator Tool can facilitate the identification of intervention priorities.

Methods: 1,038 employees in the London region of the Her Majesty's Prison Service completed the Indicator Tool and a measure of psychological well-being. Odds ratios were calculated to estimate the risk of impairment to well-being associated with exposure to psychosocial work conditions.

Results: The Indicator Tool identified 34 psychosocial work conditions as warranting improvement. Intervention priority was given to those working conditions that were both reported to be poor by $\geq 50\%$ of respondents and associated with risk of impairment to well-being. This method allowed for the identification of four areas.

Conclusions: Augmentation of the Indicator Tool with a measure of stress-related outcomes, and the calculation of simple risk estimation statistics, can assist the prioritisation of intervention candidates.

Key words: HSE Management Standards; Indicator Tool; odds ratio; well-being.

Introduction

The UK Health and Safety Executive's (HSE) management standards approach to dealing with work-related stress recommends the use of a survey to gather the views of employees on their exposure to six dimensions of the psychosocial work environment that can lead to stress-related outcomes if not properly managed [1]. These include demands, control, support, role, change, and relationships. The HSE has developed a 35-item self-report survey instrument, known as the Management Standards Indicator Tool, as a readily accessible resource that organisations may use to investigate employees' exposure to these dimensions [2]. Among the psychosocial work environment measures that practitioners and researchers have at their disposal, the utility of the Indicator Tool warrants particular attention due to its widespread adoption by organisations in recent years. The popularity of the Indicator Tool can be attributed to the HSE's campaign to make employers aware of their legal duty to assess psychosocial risk using the management standards (or equivalent) approach.

The HSE suggests that Indicator Tool responses can be used as a basis for discussions with stakeholders, usually conducted in a focus group format, concerned with the identification of psychosocial work conditions as candidates for occupational health intervention activities [3]. Given that the Indicator Tool contains 35 items, it is possible for numerous aspects of the psychosocial work environment to be identified as possible intervention candidates, which could lead to focus group participants being overwhelmed by myriad options. Furthermore, in some organisations operational constraints could render focus groups unfeasible. In both circumstances the provision of data that could demonstrate the likelihood of stress-related outcomes manifesting in those who report exposure to poor psychosocial work conditions, relative to those who report good psychosocial work conditions, could usefully facilitate the identification of psychosocial work conditions that might warrant prioritisation as intervention targets.

Few studies have examined relations between Indicator Tool scores and stress-related health outcomes. The extant literature has shown that in a small sample (n=103), drawn from a UK financial organization and a Scandinavian telecommunications organization, lack of control and role ambiguity measured via the Indicator Tool predicted depression, and demands and role ambiguity predicted stress [4]. Indicator Tool scores have also been shown to be positively associated with job satisfaction and negatively associated with job-related anxiety, job-related depression, and witnessed errors/near misses in a UK health and social services trust [5]. No studies have, to date, considered how data gathered can be used to produce risk indices to facilitate the identification of possible intervention targets.

The current study aimed to examine (a) the utility of the Indicator Tool as a tool for the identification of a manageable number of psychosocial work conditions as intervention candidates and (b) whether administration of a measure of stress-related outcomes alongside the Indicator Tool can facilitate the identification of intervention priorities through the calculation of simple risk estimation statistics.

Methods

The study was conducted in the London Area of Her Majesty's Prison Service (HMPS). The NOMS National Research Committee approved the project. The National Offender Management Service (NOMS), which has executive responsibility for HMPS, volunteered to participate in the study for two reasons. First, sickness absence data suggested an urgent imperative to tackle work-related stress: Staff sickness accounted for 590,937 lost working days in HMPS in England and Wales during 2007-8 [6] and organisational records suggested that 23% of absence could be attributed to mental and behavioural disorders (including stress, anxiety, and depression). Second, a pilot administration of the management standards procedure involving 940 HMPS employees in the Kent region in 2007-8 had revealed that it was difficult to identify possible intervention targets on the basis of Indicator Tool output alone and that it was often not operationally possible to convene employee focus groups.

In 2009, a questionnaire containing the Indicator Tool and a measure of psychological well-being was administered to HMPS employees based in the London area.

The questionnaire collected demographic data on age, sex, length of service, job category, establishment/building, directorate/unit, and work location.

Psychosocial work conditions were measured using the 35-item self-report Indicator Tool. The Indicator Tool and user manual are freely available at <http://www.hse.gov.uk/stress/standards/downloads.htm>. Scores range from 1 (poor) to 5 (desirable). An example of an item is "I am clear what is expected of me at work." Responses are given on a 5-point scale: 1 (never), 2 (seldom), 3 (sometimes), 4 (often), 5 (always). The preceding six months was set as a measurement time window. The questionnaire has acceptable psychometric properties [7]. To facilitate analysis, survey responses were compiled into the Excel-based HSE Analysis Tool [8]. This generates a score and a recommendation for action at the item level as well as an aggregate score and recommendation for each of seven sets of working conditions: job demands, control, support from managers, support from peers, role, change, and relationships. Recommendations for action are presented by the Analysis Tool in relation to benchmark data collected from 136 organisations in Britain. The four categories of

recommendation are: *red: urgent action needed* (scores fall below the 20th percentile in relation to benchmark data); *yellow: clear need for improvement* (scores are below average but not below the 20th percentile); *blue: good, but need for improvement* (scores are better than average but not at, above, or close to the 80th percentile); *green: doing very well, need to maintain performance* (scores are above or close to the 80th percentile). Scores were dichotomized into ‘poor’ (scores of 1 and 2) and ‘good’ (scores of 4 and 5) categories. Scores of 3 (sometimes) were considered neutral and excluded from the analysis.

The experience of stress may be assessed, in part, by measuring its psychophysiological or health correlates [9]. General well-being is considered to be a stress-related variable which has been shown to be sensitive to the effects of work [10,11]. General well-being was measured using the exhaustion scale from the General Well-Being Questionnaire (GWBQ) [12,13]. The exhaustion scale is a 12-item self-report measure of nonspecific symptoms of general malaise relating to fatigue, cognitive confusion, and emotional irritability. An example of an item is “Over the last six months, how often have you become easily tired?” Participants recorded their experience of these symptoms using a 5-point frequency scale of 0 (never) to 4 (always) with a time window of measurement set as the preceding 6 months. Scores ranged from 0 to 48 with low scores indicating higher levels of well-being. The GWBQ has good concurrent validity with regard to other measures of general health, overt ill-health and fatigue in different group settings; and is a consistent and reliable instrument when used in both health-related and work-related research [11, 14, 15].

A split was imposed on the well-being data. Consistent with previous studies [10, 14], participants with scores of ≥ 25 were assigned to the ‘poor’ well-being group. Those with a score of ≤ 24 were assigned to the ‘good’ well-being group. The rationale behind this dichotomization was that scores of ≥ 25 logically indicate levels of well-being that are unacceptably poor with participants reporting *sometimes*, *often*, or *always* experiencing most of the symptoms addressed in the questionnaire. In contrast scores of ≤ 24 were indicative of participants reporting *never* or *rarely* experiencing symptoms of poor well-being.

The odds ratio (OR) statistic with 95% confidence interval (CI) was calculated to analyse the association between reports on each of the 35 aspects of the psychosocial work environment measured through the IT and well-being. In addition, the OR was calculated for the aggregate score pertaining to each of the seven analysis categories.

To identify psychosocial work conditions that might warrant prioritisation as possible intervention candidates, the authors applied a method [16] originally developed for the HSE as part of the research programme that informed the development of the management standards [17]. Using this method, priority was

given to working conditions that were both reported to be poor by $\geq 50\%$ of respondents and demonstrated by the OR statistic to be associated with poor well-being. The 50% reporting threshold was designed to allow for the identification of aspects of the psychosocial work environment reported as problematic by the statistical majority of respondents. Placement of the threshold at this level can lead to the identification of underlying problems, or organisational pathologies, associated with the design, management, and organisation of work that present themselves as obvious intervention candidates [16].

Results

The questionnaire containing the Indicator Tool and a measure of psychological well-being was administered to 3,579 HMPS employees based in the London region. 1,038 completed and usable questionnaires were returned (29% response rate). Because of the low response rate respondents' characteristics were compared to those of all London Area NOMS employees to ensure sample representativeness. Comparison of the two groups' characteristics showed that in terms of age and length of service there were no significant differences that would render the sample unrepresentative of the parent population (table 1). *T*-tests revealed significant differences for gender and job grade ($p < 0.05$). Though statistically significant, differences between the sample and London Area NOMS employees were, in percentage terms, small and unlikely to present a substantive challenge to the representativeness of the sample.

[INSERT TABLE 1 HERE]

Table 2 shows that scores on six Indicator Tool items distributed across five of the seven analysis categories were identified as being below the 20th percentile in comparison to benchmark data gathered by the HSE from 136 organisations. These items were 'red-lighted' by the Analysis Tool with the recommendation 'urgent action needed'. At the aggregate level, none of the seven management standards categories were identified as being below the 20th percentile.

Scores on 16 items were identified as being between the 20th and the 49th percentile in comparison to benchmark data. These items were 'yellow-lighted' with the recommendation 'clear need for improvement'. These items were dispersed across all seven of the analysis categories. At the aggregate level, six of the seven analysis categories were identified as being in this group, the exception being job demands.

Scores on 12 items were identified as being between the 50th and the 79th percentile. These items were ‘blue-lighted’ with the recommendation ‘Good, but need for improvement’. These items were dispersed across four of the analysis categories: demands, support from managers, role, and change. At the aggregate level, one of the seven analysis categories - demands - was identified as being in this group.

In sum, 34 out of a total of 35 aspects of the psychosocial work environment examined through the Indicator Tool were identified by the Analysis Tool as requiring improvement when compared to benchmark data gathered from organizations in Britain .

[INSERT TABLE 2 HERE]

Overall, employees who reported their psychosocial work environment to be ‘poor’ were three times more likely to have a ‘poor’ well-being score than those who reported their psychosocial work environment to be ‘good’ (OR = 3.34, CI = 3.14 – 3.54). This illustrates the centrality of workers’ cognitive appraisals of the work environment to the determination of stress-related health outcomes [18]. Table 2 shows the aggregate OR for each of the seven analysis categories. At the aggregate level, problems associated with ‘role’ in the organisation presented the strongest association with poor well-being (OR = 5.40, CI = 4.29 – 6.81), and ‘control’ over the job, the weakest (OR = 2.91, CI = 2.53 – 3.35).

Table 2 also presents OR data for each of the 35 Indicator Tool items. The OR ranged from 1.80 (CI = 1.23 – 2.61) (Q19: “I have a choice in deciding what I do at work”) to 9.88 (CI = 5.34 – 18.24) (Q1: “I am clear what is expected of me at work”). The mean item-level OR was 4.49.

The method for the identification of priority intervention candidates placed priority on those areas that were both reported by $\geq 50\%$ of participants to be ‘poor’ and identified by the OR statistic to be associated with ‘poor’ well-being. Among the 35 areas examined through the Indicator Tool, four met these criteria (items 9, 19, 20, 28). None of these areas were ‘red lighted’ by the Analysis Tool as warranting urgent action.

Discussion

In the context of the prison service, this study showed a limitation of the Indicator Tool when used as the sole mechanism for the identification of problematic aspects of the psychosocial work environment that might warrant prioritisation within an intervention programme. The study found that 34 out of a total of 35 psychosocial work conditions examined through the Indicator Tool were identified as being below the 80th

percentile when compared to the HSE's current benchmark data. Each of the 34 areas was therefore deemed by the Analysis Tool to be in need of improvement. Six received the recommendation *red: urgent action needed*, 16 *yellow: clear need for improvement*, and the remainder *blue: good, but need for improvement*. At the aggregate level, six of the seven analysis categories were 'yellow lighted', thereby indicating a 'clear need for improvement'. This finding shows that the Indicator Tool can identify numerous aspects of the psychosocial work environment as being in need of improvement and, consequently, conveys something of the challenge that organisations can face when attempting to prioritise issues in terms of the need for action.

Recommendations for improvement produced by the Analysis Tool are made on the basis of comparison to benchmark data rather than the reality of the specific organization; published studies are yet to emerge to demonstrate the effectiveness of interventions applied in response to Analysis Tool recommendations. The origin of the benchmark data might help to explain why all but one of the 35 areas examined through the Indicator Tool were identified as requiring attention. The current benchmark data set originates from 136 organisations in Britain that have administered the Indicator Tool and consists of organisational averages [8]. Approximately one third of the current benchmark data derives from commissioned projects undertaken by a single consultancy group. In addition, data has been contributed by the University of Plymouth's psychology department and the Health and Safety Executive, Northern Ireland [8]. The benchmark data set does not yet contain data from a representative number of occupational groups that are known to present with particularly high levels of work-related stress such as prison workers [19]. This suggests that the existing benchmark data might be inappropriate as a basis on which to make judgments in relation to data gathered in challenging work environments but with time the benchmark data should become more relevant to such groups of workers. However, the current lack of sector-specific benchmark data highlights a potential limitation of management standards programme at the present time.

Participants reported potentially harmful exposure to a wide range of psychosocial job characteristics, consistent with previous studies that have examined stress in prison officers (who comprised 31% of the sample in this study). Such studies have shown the contributory role of a host of psychosocial job characteristics to stress-related outcomes including relationships with peers, support from managers, workload, role conflict and ambiguity, and responsibility, among others [19-23]. Prison employees are recognised as being exposed to a particularly powerful and wide-ranging set of challenging psychosocial work conditions, and this might account for the fact that 34 of the 35 areas examined through the Indicator Tool were identified by the Analysis Tool as warranting improvement.

The method applied for the identification of intervention priorities [16] was found to be effective for the identification of a manageable number of intervention candidates (four). None of the areas identified via this method were red-flagged for urgent action by the Indicator Tool, and only two were yellow-flagged with a 'clear need for improvement.' This suggests that the combination of information on the percentage of respondents who report an area to be problematic with associated well-being scores can provide a more complete picture of the pervasiveness and possible consequences of a poor psychosocial work environment than can be achieved by reference to Indicator Tool data alone. Interestingly, all four intervention priority areas produced a relatively low OR. In other words, the method proved capable of identifying psychosocial working conditions reported to be problematic by a majority of employees, but these areas were associated with better levels of well-being than some other areas that were reported to be problematic by fewer than 50% of respondents. It is also noteworthy that all 35 Indicator Tool items produced an odds ratio greater than 1, indicating that in this sample of workers reports of poor working conditions were consistently associated with poor well-being.

The study further demonstrates the utility of the OR statistic in the occupational health context. When reported in OR form, information on the likelihood of poor outcomes having manifested in employees who report poor psychosocial work conditions relative to those who report good psychosocial work conditions can be understood without prior statistical knowledge and can provide a solid foundation for decision making in relation to the allocation of intervention resources. However, caution must be exercised in relation to the interpretation of large confidence intervals.

In their 2007 review of research on work-related stress in prison employees, Keinan and Malach-Pines noted that the majority of studies have suffered from a small or non representative sample [22]. The former shortcoming was not present in this study and the latter was only partially evident and unlikely to present a substantive challenge to the sample's representativeness. Like previous studies that have examined the application of the Indicator Tool in the organisational setting [5, 24], this study suffered from a poor response rate. Whether a low response rate is common in studies where the Indicator Tool is used remains an empirical question; should the emerging management standards literature reveal this to be so, research will be warranted to ascertain the reasons for such and to develop response rate improvement measures.

In conclusion, this study has contributed to our knowledge by showing that psychosocial risk management activities conducted within the management standards framework can benefit from the

administration of a short measure of stress-related outcomes alongside the Indicator Tool to facilitate the identification of work characteristics that might warrant prioritisation within a programme of intervention.

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Table 1. Comparison of respondents' socio-demographic and socio-economic characteristics with London Area National Offender Management Service employees as a whole

	Respondents	Total staff
	<i>n</i> (%)	<i>n</i> (%)
Gender		
Male	572 (57)	2,238 (61)
Female	439 (43)	1,410 (39)
Age group		
17-25	93 (9)	357 (10)
26-35	218 (22)	812 (22)
36-45	331 (33)	1,157 (31)
46-55	267 (26)	915 (25)
56+	107 (10)	407 (11)
Length of service		
0-2 years	230 (23)	848 (23)
2-5 years	210 (21)	827 (23)
5-10 years	254 (25)	836 (23)
11+ years	314 (31)	1,137 (31)
Job category		
operational manager grades A-D	15 (2)	18 (1)
operational manager grades E-G	27 (3)	81 (2)
principal officer	34 (4)	101 (3)
senior officer	87 (11)	320 (9)

prison officer	321 (40)	1,679 (46)
OSG	113 (14)	569 (15)
non-operational manager grades A-D	8 (1)	17 (1)
non-operational manager grades E-G	55 (7)	153 (4)
executive officer/senior personal secretary	43 (5)	170 (5)
AO/AA/personal secretary	102 (13)	540 (14)

Note. Where figures do not total to 100% information was not provided by respondents.

Table 2. Associations between psychosocial hazard exposures and psychological well-being, odds ratios with 95% CI.

IT items by MS category (mean score)	Well-being OR (95% CI)
Demands	
Q3 – Different groups at work demand different things from me that are hard to combine (3.01)	6.03 (3.89 - 9.34) ^{b, d}
Q6 – I have unachievable deadlines (3.51)	4.17 (2.87 - 6.07) ^c
Q9 – I have to work very intensively (2.40)	2.30 (1.23 - 4.29) ^{c, d}
Q12 – I have to neglect some tasks because I have too much to do (3.11)	6.27 (4.17 - 9.42) ^c
Q 16 – I am unable to take sufficient breaks (3.46)	2.78 (1.93 - 4.00) ^c
Q 18 – I am pressured to work long hours (3.71)	3.56 (2.44 - 5.21) ^c
Q 20 – I have to work very fast (2.80)	2.74 (1.77 - 4.24) ^{c, d}
Q 22 – I have unrealistic time pressures (3.47)	6.19 (4.18 - 9.17) ^c
Aggregate (3.18)	3.31 (2.87 – 3.81)
Control	
Q 2 – I can decide when to take a break (3.45)	3.07 (2.17 - 4.32) ^b
Q 10 – I have a say in my own work speed (3.3)	3.69 (2.59 - 5.27) ^b
Q 15 – I have a choice in deciding how I do my work (3.4)	3.47 (2.42 - 4.99) ^a
Q 19 – I have a choice in deciding what I do at work (2.68)	1.80 (1.23 - 2.61) ^{b, d}
Q 25 – I have some say over the way I work (3.58)	4.79 (3.24 - 7.08) ^a
Q 30 – My working time can be flexible (3.24)	2.70 (1.94 - 3.75) ^b
Aggregate (3.27)	2.91 (2.53 – 3.35) ^b

Support (manager)	
Q 8 – I am given supportive feedback on the work I do (3.21)	4.55 (3.20 - 6.49) ^c
Q 23 – I can rely on my line manager to help me out with a work problem (3.65)	3.22 (2.22 - 4.66) ^b
Q 29 – I can talk to my line manager about something that has upset or annoyed me (3.76)	4.36 (2.97 - 6.40) ^c
Q 33 – I am supported through emotionally demanding work (3.12)	6.57 (4.39 - 9.83) ^b
Q 35 – My line manager encourages me at work (3.54)	4.55 (3.13 - 6.61) ^a
Aggregate (3.45)	4.56 (3.88 - 5.37) ^b
Support (peer)	
Q 7 – If work gets difficult, colleagues will help me (3.71)	3.72 (2.47 - 5.60) ^b
Q 24 – I get help and support I need from colleagues (3.76)	5.02 (3.22 - 7.81) ^b
Q 27 – I receive the respect at work I deserve from my colleagues (3.55)	5.77 (3.89 - 8.56) ^b
Q 31 – My colleagues are willing to listen to my work-related problems (3.59)	2.34 (1.64 - 3.36) ^a
Aggregate (3.65)	3.81 (3.14 - 4.64) ^b
Relationships	
Q 5 – I am subject to personal harassment in the form of unkind words or behavior (4.03)	4.52 (3.00 - 6.80) ^b
Q 14 – There is friction or anger between colleagues (3.26)	4.24 (2.90 - 6.21) ^b
Q 21 – I am subject to bullying at work (4.29)	4.98 (3.09 - 8.02) ^a
Q 34 – Relationships at work are strained (3.20)	4.58 (3.15 - 6.65) ^b
Aggregate (3.70)	4.05 (3.36 - 4.88) ^b
Role	
Q1 – I am clear what is expected of me at work (4.19)	9.88 (5.34 - 18.24) ^b
Q 4 – I know how to go about getting my job done (4.36)	6.82 (3.32 - 14.03) ^c

Q 11 – I am clear what my duties and responsibilities are (4.17)	5.30 (3.09 - 9.10)
Q 13 – I am clear about the goals and objectives of my department (4.06)	5.70 (3.51 - 9.25) ^c
Q 17 – I understand how my work fits into the overall aim of the organization (3.99)	3.94 (2.57 - 6.02) ^a
Aggregate (4.15)	5.40 (4.29 - 6.81) ^b
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Change	
Q 26 – I have sufficient opportunities to question managers about change at work (3.17)	3.56 (2.54 - 5.00) ^b
Q 28 – Staff are always consulted about change at work (2.75)	3.15 (2.15 - 4.62) ^{b, d}
Q 32 – When changes are made at work, I am clear how they will work out in practice (3.06)	5.38 (3.60 - 8.03) ^c
Aggregate (2.99)	3.75 (3.04 - 4.63) ^b

^a Job characteristic identified by Analysis Tool as “Urgent action needed”.

^b Job characteristic identified by Analysis Tool as “Clear need for improvement”.

^c Job characteristic identified by Analysis Tool as “Good, but need for improvement”.

^d Job characteristic reported by $\geq 50\%$ of respondents to be ‘poor’.

Key points:

- The HSE recommends that data generated using the Indicator Tool is used as a basis for discussion on the identification of psychosocial work conditions that warrant prioritisation within an intervention programme. However, the Indicator Tool may generate an overwhelming number of possible interventions.
- The Indicator Tool can identify intervention candidates that might not necessarily be associated with risk of harm.
- The identification of psychosocial work characteristics that might warrant prioritisation within an intervention programme can be facilitated by the administration of a measure of stress-related health outcomes alongside the Indicator Tool.