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ABSTRACT

Background: There is concern about lack of consistency in the design of case definitions used to measure work-related stress in national workforce surveys and the implications of this for the reliability and validity of prevalence estimates as well as for developments in policy and practice on tackling work-related stress.

Aims: To examine associations between case definitions used for the measurement of work-related stress in nationally representative workforce surveys and the prevalence rates generated.

Methods: The study focused on 18 nationally representative workforce surveys conducted between 1995 and 2008 that involved British samples. The published report from each survey was scrutinized for evidence of the case definition used to measure work-related stress and the associated prevalence rate.

Results: Several types of case definition were identified that differed in terms of their theoretical basis, structure, and content. Each was associated with a unique range of prevalence rates.

Conclusions: The results illustrate the challenge presented to the production of valid and reliable estimates of the scale of work-related stress by inconsistent case definition design. The imperative for theory-based consistency in the design of case definitions used for the measurement of work-related stress in national workforce surveys is highlighted.

INTRODUCTION

The findings of nationally-representative workforce surveys that include a measure of work-related stress inform official occupational health statistics; impact assessments of law, guidance, and policy concerned with occupational health improvements;[1] the identification of emerging risks, and;[2] future policy and research priorities. Lack of theoretical grounding and inconsistency in the measurement of work-related stress is of concern because it might make it difficult to produce valid and reliable estimates of the scale of the problem.[3-5] An examination of the relationship between case definitions used for the measurement of work-related stress in national surveys and the prevalence rates generated is therefore of importance.

METHOD

Data on sample size, prevalence, and case definition characteristics were taken from the published reports associated with eighteen surveys that included a representative sample of the British workforce, a measure of work-related stress, and involved data collection between 1995 and 2008.

RESULTS

It was possible to classify the case definitions used in the surveys into two categories (Table 1). The first conceptualised work-related stress in terms of a perceived health outcome arising from exposure to hazardous work characteristics, and the second in terms of a perception of the overall ‘stressfulness’ of work, measured using a single-item.

[INSERT TABLE 1 HERE]

[INSERT TABLE 2 HERE]

The wording and structure of the case definitions is presented in Table 2. Two variants of the perceived health outcome case definition were identified, each of which produced a unique prevalence rate. One pertained to the EWC survey series (M = 20.5%, SD = 7.82, n = 3), the other to the SWI survey series (M = 1.4%, SD = 0.22, n = 8). The single-item approach likewise produced a unique prevalence rate (M = 14.1%, SD = 2.49, n = 7). The published report to three of the surveys that utilised the single-item approach detailed the number of respondents who reported their work to be "extremely stressful". Application of this more stringent case threshold generated a lower prevalence rate (M = 3.2%, SD = 0.4, n = 3).

DISCUSSION

Although data considered in the current study were not receptive to further analysis that would have permitted conclusions to be drawn on the amount of variance in prevalence rates that can be explained by case definition design versus that which can be explained by features of survey design and administration, the findings nevertheless indicate that, at least to some degree, case definition wording shapes the prevalence rate.

The structure and wording of the case definitions reveals that design has been informed by an historical theoretical perspective, or no theoretical perspective. Contemporary transactional stress theory, which has its focus on the dynamic engagement between worker and work, and which emphasises cognitive processes and coping mechanisms,[6] has not informed case definition design. The perceived health outcome approach conceptualises stress as a dependent

variable and, as such, is consistent with a response-based theoretical perspective now widely considered outmoded.[7] In the same way, the single-item approach does not have any obvious theoretical basis, although there is some evidence to suggest that survey respondents might interpret the word “stress” in a manner consistent with the transactional perspective.[8]

The considerable difference in the mean prevalence rate generated by the SWI and EWC survey series’ is surprising given that both applied a perceived health outcome case definition. This difference might be explained by the question wording used: Whereas the EWC approach requires respondents to indicate whether their work has affected their health in terms of “stress”, the SWI approach considers “stress, depression or anxiety” in combination. It is possible that reference to clinically recognised disorders in the latter approach inclines respondents to interpret the item in reference to serious health outcomes, whereas the former might be assumed to refer to less severe experiences. Whether this is indeed the case remains an empirical question. Several methodological factors may also help to account for the contrasting prevalence rate generated by these two series. First, they employ vastly differing sample sizes. Second, the focus within the SWI surveys on a host of employment-related issues may lead to a lower prevalence rate than is achieved by surveys that focus exclusively on issues of health and safety.[9] Third, it is possible that respondents are more likely to agree to participate in a working conditions survey if they have themselves experienced a work-related injury or illness, resulting in the over-representation of such individuals within the EWC sample.[9]

The single-item case definition generated a mean prevalence rate considerably higher than the SWI approach. Although some of this variance will be attributable to differences in survey design and administration it is also likely that some is due to wording that encourages interpretation of the question in terms of *exposure* to work-related stress as opposed to work

having *affected* health.[10] Interestingly, when the case threshold within the single-item approach was shifted to include only those who indicated that their work was “extremely stressful”, a prevalence rate broadly consistent with the SWI rate was achieved. It is possible that the higher threshold captures cases where work has affected health and excludes cases that involve exposure to work-related stress. Importantly, in terms of its utility in future surveys, the single-item approach produced a reliable prevalence rate across surveys. Despite this attractive attribute, the single-item approach does not make explicit the various components of the transactional stress process; as such, data gathered in this way provide little guidance for the design of stress-reduction interventions. Studies are required to explore the determinants of participants’ responses within this approach; if it can be empirically established that respondents consider the single-item case definition in a transactional manner support for the wider use of this approach in national surveys may be found.

This study allows for the conclusion that variance in the wording of case definitions for work-related stress used in nationally-representative surveys contributes to the production of inconsistent prevalence estimates. There is a clear imperative for the development of a standardised and theory-based work-related stress case definition for use in national workforce surveys.

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Table 1

Prevalence rates for work-related stress in nationally representative surveys in Britain (1995-2008)

Survey	Data source	*N*	Cases of work-related stress	Prevalence (%)	Data collection period
		Perceived health outcome case definition			
Second European Working Conditions Survey (EWC2)	http://www.eurofound.europa.eu/ewco/surveys/index.htm	1,066	288[a]	27.0	1995-6
Third European Working Conditions Survey (EWC3)	http://www.eurofound.europa.eu/ewco/surveys/index.htm	1,514	342[a]	22.6	2000
Fourth European Working Conditions Survey (EWC4)	http://www.eurofound.europa.eu/ewco/surveys/index.htm	1,058	125[a]	11.8	2005
Self-Reported Work-Related Illness in 1995 (SWI95)	http://www.hse.gov.uk/statistics/publications/swi.htm	17,900[a]	179	1.0	1995-6
Self-Reported Work-Related Illness in 1998/99 (SWI98/99)	http://www.hse.gov.uk/statistics/publications/swi.htm	63,467[a]	952	1.5	1999
Self-Reported Work-Related Illness in 2001/02 (SWI01/02)	http://www.hse.gov.uk/statistics/publications/swi.htm	60,188[a]	963	1.6	2001-2
Self-Reported Work-Related Illness in 2003/04 (SWI03/04)	http://www.hse.gov.uk/statistics/publications/swi.htm	55,250[a]	884	1.6	2003-4
Self-Reported Work-Related Illness in 2004/05 (SWI04/05)	http://www.hse.gov.uk/statistics/publications/swi.htm	57,000[a]	798	1.4	2004-5
Self-Reported Work-Related Illness in 2005/06 (SWI05/06)	http://www.hse.gov.uk/statistics/publications/swi.htm	53,833[a]	646	1.2	2005-6
Self-Reported Work-Related Illness in 2006/07	http://www.hse.gov.uk/statistics/publications/swi.htm	51,625[a]	826	1.6	2007

(SWI06/07)					
Self-Reported Work-Related Illness in 2007/08 (SWI07/08)	http://www.hse.gov.uk/statistics/publications/swi.htm	50,867[a]	763	1.5	2008
	Single-item case definition				
Psychosocial Working Conditions survey 2004 (PWC04)	http://www.hse.gov.uk/statistics/publications/illhealth.htm	1,827	289 (66)	15.8 (3.6)	2004
Psychosocial Working Conditions survey 2005 (PWC05)	http://www.hse.gov.uk/statistics/publications/illhealth.htm	1,474	223 (48)	15.1 (3.3)	2005
Psychosocial Working Conditions survey 2006 (PWC06)	http://www.hse.gov.uk/statistics/publications/illhealth.htm	1,476	177[a] (-)	12.0 (-)	2006
Psychosocial Working Conditions survey 2007 (PWC07)	http://www.hse.gov.uk/statistics/publications/illhealth.htm	1,069	145[a] (-)	13.6 (-)	2007
Psychosocial Working Conditions survey 2008 (PWC08)	http://www.hse.gov.uk/statistics/publications/illhealth.htm	1,069	183[a] (-)	17.1 (-)	2008
Bristol Stress and Health at Work study (SHAW)	http://www.hse.gov.uk/research/crr_pdf/2000/crr00265.pdf	4,044[b]	751 (112)	18.5 (2.8)	1998
Workplace Health and Safety Survey (WHASS05) [b]	http://www.hse.gov.uk/statistics/publications/whass.htm	10,016	1,190 (-)	12.0[c] (-)	2005

Note. Values enclosed in parenthesis represent cases where work was reported to be "extremely stressful", i.e., the fifth point on a 5-point Likert scale.

Note. Dashes indicate unavailable data.

Note. SWI prevalence rates are typically calculated using data drawn from respondents who have ever worked, and are usually reported in this way. A programming error in the computer aided interviewing protocol to SWI07/08 resulted in the question on work-related stress being posed only to those who had worked in the previous 12 months. To facilitate the comparison of

prevalence rates across surveys within the SWI series, only prevalence data for those who had worked in the previous 12 months are considered here.

[a]Estimated.

[b]Sub-sample currently in employment at Time 1.

[c]The WHASS also included a “perceived health outcome” case definition, responses to which were not reported in the initial (2005) report and remain unpublished.

Table 2

Case definition types, wording, and response scales

Case definition type	Case definition wording	Response scale
Perceived health outcome (EWC variant)	*Screening question*: "Does your work affect your health, or not?" *Follow up question*: "How does it affect your health?"	Choose one or more ailments from a series that includes "stress".
Perceived health outcome (SWI variant)	*Screening question*: "In the past 12 months have you suffered from any illness, disability, or other physical or mental problem that was caused or made worse by your work?" [a] *Follow up question*: "How would you describe this illness or those illnesses?"	Choose one or more ailments from a series that includes "stress, depression or anxiety".
Single-item perceived stressfulness	"In general, how do you find your job?"	(1) not at all stressful, (2) mildly stressful, (3) moderately stressful, (4) very stressful, (5) extremely stressful.[b]

[a] The SWI screening question has altered over the years that the series has operated. A notable modification, in terms of its potential impact on the prevalence rate for work-related stress, concerned the introduction in SWI98/99 of reference to "mental problem", an innovation maintained in subsequent surveys.

[b] Each of the surveys that applied a single-item case definition set a "very stressful" case threshold to identify those with high work-related stress.

Key Points

- There is concern about lack of consistency in the design of case definitions used to measure work-related stress in national workforce surveys and the implications of this for the reliability and validity of prevalence estimates.
- This study found that several case definitions were used across nationally-representative workforce surveys that involved British samples. Each was associated with a unique range of prevalence rates.
- The development of a standardised and theory-based case definition for use in large-scale surveys would contribute to providing a reliable and valid indication of the scale of work-related stress.