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Inter-Method Agreement Between O*NET and Survey Measures of Psychosocial Exposure Among Healthcare Industry Employees

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Background *Imputed job characteristics had been used as proxy of exposure to working conditions. O*NET database provides job information that could be useful to evaluate psychosocial working conditions.*

Methods *Consistency and total agreement between O*NET and self-reported psychosocial exposure (demand/control (DC), effort/reward (ER) proxy models, and emotional labor scale) were compared between healthcare specific (12 occupations, 215 workers) and other jobs (12 occupations, 146 workers).*

Results *For dimensions of the DC and ER models, Spearman correlation and ICC coefficients were, in general, consistently high (ICC = 0.61 for decision latitude, 0.41 for rewards, 0.53 for ER ratio, and lower for others), particularly in the healthcare specific jobs.*

Conclusion *O*NET and questionnaire based psychosocial indicators showed a good job level agreement particularly on healthcare specific jobs. O*NET may be a useful source of job level psychosocial exposure, especially for the DC and ER models, for healthcare occupations within these types of facilities.* Am. J. Ind. Med. 50:545–553, 2007.

KEY WORDS: psychosocial; exposure; agreement; demand control; effort reward

INTRODUCTION

Questionnaires eliciting self-reports are the most common method for assessing exposure to psychosocial work stressors [Landsbergis and Theorell, 2000a]. Attribution based on secondary data [Schwartz, 2000] and the expert-observer [Greiner and Krause, 2000] methods are also used.

Attribution of scores, based on the utilization of national databases (by surveying workers and/or expert analysts), has some advantages over self-report or expert-observer methods. These are its reduced costs, the possibility of including job characteristics having only job title information, its lower susceptibility to observer bias than studies using external-observers, and the control of individual level self-report bias. Individual level misclassification is its main disadvantage.

Self-report method accounts for between economic sectors and within job variability; however, self-report bias

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can increase the probability of differential misclassification, decreasing or reversing [Winkleby et al., 1988; Nyklicek et al., 2001; Greiner et al., 2004] or also increasing [Podsakoff et al., 2003] the exposure-outcome association.

U.S. health surveys from 1969 to 1977 received attribution of work characteristics to document the association between job strain and myocardial infarction [Karasek et al., 1988; Schwartz et al., 1988; Schwartz, 2000]. Another U.S. system was the Dictionary of Occupational Titles (DOT), which is now being replaced by the Occupational Information Network-(O*NET^{TM}) [Schwartz, 2000; O*NET Consortium, 2005].

This study will focus on O*NET as a source of psychosocial job exposure. O*NET is intended to help the public to ''make informed decisions about education, training, career choices, and work'' [O*NET Knowledge site, 2005] and it defines its data collection as based on a statistical random sample of businesses and occupations within those businesses [O*NET Data Collection site, 2005]. O*NET contains information related to specific occupations and organizes its information in different domains that cover several hundreds of variables. All the information is averaged at the job title level and is publicly available online at the O*NET Center webpage (www.onetcenter.org).

O*NET has been previously utilized as source of psychosocial exposure [Glomb et al., 2004], but so far we have not found information about the agreement between O*NET-based exposure and local self-report. To study this agreement is important because eventually both measurements could be utilized simultaneously, augmenting their advantages and minimizing their disadvantages [Landsbergis and Theorell, 2000b], to explore the association of psychosocial working conditions with health outcomes. Or, in some extreme cases, O*NET could become the only source of exposure measurement.

Researchers of the PHASE (Promoting Safe and Healthy Employment in Healthcare Project, a National Institute for Safety and Health funded project to study the association of socioeconomic status (SES) and working conditions in healthcare workers) studied the items contained in the O*NET 6.0 and selected indicators of psychosocial exposure.

The main aim of this study was to assess the inter-method agreement on measuring psychosocial exposure obtained by O*NET indicators with self-reported information from employees of three Massachusetts healthcare institutions.

Although we have found no empirical evidence specifically addressing psychosocial job exposure variability across economic sectors, some authors have expressed their concern about this issue [Schwartz et al., 1988; Schnall et al., 1994; Schwartz, 2000]. The second aim of this study is to determine whether those jobs that are known for being traditional in the healthcare sector have better level of agreement than those generic jobs that are usually found across many economic sectors.

METHODS

Sample

A total of 1,613 healthcare workers, 18 years old or older, from three facilities (one hospital and two nursing homes) in Massachusetts, were invited by the PHASE project to answer a confidential questionnaire that was mailed with informed consent and postage-paid return envelope by the hospital Human Resources Departments for hospital workers and directly from the PHASE Project office for nursing home workers to the workers' home addresses in multiple waves during the period of May 2003 to April 2004.

Employee names and addresses were provided by the employer. For those who did not return the survey within 6 weeks, it was sent again after reviewing, and correcting when needed, address information and employment status. Facilitators (available to perform by phone and face-to-face meetings) and surveys in Spanish, Portuguese, and Creole were also available at workers' request. Overall the survey response was 29.5%.

Inclusion/exclusion criteria

From 476 workers (59 jobs), only those on jobs with 5 or more survey respondents per facility (351 workers, 24 jobs) were selected to study agreement between survey and O*NET indicators.

Demographic and job information

Personnel roster information included employees' identification, date of birth, job title, gender, hourly wage.

A trained job coder and a PHASE researcher with experience in the healthcare industry gathered information about each job title and coded them using the 2000 Standard Occupational Classification (SOC) system [Bureau of Labor Statistics, 2005]. The entire survey data were matched up with its respective roster information based on the same identifiers available in both of them.

Two individual level measures of SES were also available, hourly wage from the roster and education (11 categories from no school to doctoral or professional degrees) from the survey.

Psychosocial Exposures

Self-reported data

The Job Content Questionnaire (JCQ), a valid and reliable instrument [Karasek et al., 1998; Ostry et al., 2001;

Landsbergis et al., 2002; Gimeno et al., 2004], was utilized in the questionnaire to assess demand, control, and support dimensions. One question (conflicting demands) was reworded and reversed. Job strain was computed as the ratio of psychological demand over decision latitude [Karasek et al., 1998].

Emotional labor was measured with two questions, based on their face and content validity, from the Spratt's ''Emotions at Work'' scale [Spratt, 1996].

Three extrinsic reward questions from the original Siegrist questionnaire [Institut fur Medizinische Soziologie University of Duesseldorf, 2002] were modified to assess ''rewards.'' The selected questions were ''Considering all my efforts and achievements, I receive the respect that I deserve at work,'' ''My job security is good,'' and ''I have good opportunities for promotion, increase in income, or professional development.'' In the computation of the proxy effort reward imbalance (ER) ratio, psychological demand was the numerator and the denominator was the mean of rewards multiplied by a factor to equalize the weight of demand given by its JCQ scoring procedure.

*O*NET data*

Using the O*NET system [O*NET Center, 2005a], each 6-digit SOC code was matched to its respective occupation under the O*NET coding classification system of occupations [O*NET Consortium, 2005].

O*NET items were initially selected by three researchers. A larger group of researchers assessed content validity to approve the selection. All the items were expressed as the percentage of the maximum theoretical value of their original scales. Later and for each scale, those items with low correlation with the other items were excluded to ensure a Cronbach's alpha of at least 0.7.

Working condition variables extracted from the O*NET database were used to construct proxy scales for the DC model dimensions [Karasek and Theorell, 1990]: coworker social support, supervisor social support, psychological demand, and job control; for the effort reward model dimensions [Institut fur Medizinische Soziologie University of Duesseldorf, 2002], and for the emotional labor construct [Spratt, 1996]. Only emotional labor contains job incumbent data (in four of the eight items that this scale considered).

O*NET online includes series of occupational families [O*NET Center, 2005b]. All jobs in our sample that were included in any of the two O*NET healthcare families were considered as ''healthcare-specific;'' all others were defined as ''non-healthcare-specific'' or ''generic.'' Each group had 12 jobs according to O*NET coding system; 215 workers in healthcare-specific jobs and 146 in generic jobs answered the survey.

Data Management and Data Analyses

All survey psychosocial exposure variables and scales were transformed to percentages of their minimum (0%) and maximum (100%) possible values for comparable scaling with the O*NET items. Computation of ratios required, when needed, the addition of a small value (0.1) to avoid a division by zero; this generated a few high extreme values that were eliminated by limiting the highest value of the ratio to 10 times the average.

All analyses were weighted to compensate for undersampling of female, white and Anglo hospital nurses (by two for each of them and one for everyone else).

Analyses

To determine the agreement between questionnaire and O*NET psychosocial exposure, the following two set of analyses (job level and multilevel) were performed.

1. For the job level agreement, two different indicators of agreement were computed:

a. *Consistency of agreement*. Spearman correlation coefficients were computed for each pair of survey-O*NET indicators. High and significant correlation values would imply that the questionnaire-O*NET indicators vary consistently (go up or down along each other).
b. *Total agreement*. Intra-class correlation (ICC) was utilized as a measure of job level total agreement, which considers the numeric distance between the pair being measured, not only their consistent variation along each other. Two-way mixed total agreement ICCs were computed by the reliability procedure in SPSS 13.0. Fischer's tests were utilized to determine statistical significance.

2. For the agreement between occupational and individual level scores (*multilevel agreement*), multilevel regression models were utilized to determine ICC as the amount of between jobs variability in relation to the total variability (the addition of between and within jobs variability) of questionnaire indicators. Questionnaire-O*NET agreement is expressed as the *reduction in ICC* from the unconditional (no predictor) to the unadjusted model (only O*NET indicator as predictor). When ICC is zero at the unconditional model, implying no clustering of survey indicators by job, this method cannot evaluate multilevel agreement.

These multilevel models provided also crude regression coefficients, intercepts, and information about the fit of the association to a linear model. The magnitude of the intercept should be 0 if there is a perfect agreement or perfect disagreement; positive if the lowest survey values tend to be overestimated by O*NET values and negative if the lowest

survey values tend to be underestimated by O*NET values. The expected value of the slopes are 1 if perfect agreement, 0 if no agreement, and a value of −1 if the disagreement is perfect. The regression coefficient should be interpreted more as an indicator of consistency of agreement than an expression of total agreement.

To perform these analyses, the GLIMMIX procedure in SAS 9.1 was used with random intercept and job as the group level (using the O*NET classification system).

3. To determine whether those jobs specific to the healthcare sector had better inter-method agreement than those jobs that may be found across in other economic sectors, all previous analyses were also stratified by healthcare specificity of the jobs.

RESULTS

There was no consistent difference in O*NET indicators between those jobs that were and were not included in the study due to their number of survey respondents (not shown). In healthcare-specific jobs, the non-included jobs have higher psychological demands and rewards than included jobs (not shown). Generic included and non-included jobs are similar for all the indicators.

Job Level Agreement

Consistency of agreement and total agreement

Among the generic jobs, the demand/control and the effort/reward model variables had the largest Spearman regression coefficients; however, only psychological demand and effort reward ratio correlation coefficients were significant (Table I). When using ICC to measure total agreement, decision latitude and effort reward ratio had the largest magnitude of ICC.

Among the jobs that are not healthcare specific, all the Spearman correlation coefficients were non-significant and, in general, their magnitudes are smaller than those for healthcare-specific jobs. Only effort reward ratio ICC is significant and it has almost the same magnitude than in healthcare-specific jobs.

Multilevel Agreement (Occupational Scores With Individual Scores Agreement)

Among the healthcare-specific jobs, the unconditional models show that only decision latitude and emotional labor have a between job variability higher than 10% of the total variability (ICC) of survey psychosocial indicators. All the other psychosocial indicators have between job variability smaller than 8% and even zero, making it difficult or non-possible to study agreement. After controlling for their respective O*NET indicator, it was possible to observe in decision latitude, psychological demand, job strain, and emotional labor a reduction of their ICC values higher than or closer to 50%. Only rewards had a lower reduction.

Among the generic jobs, decision latitude, psychological demands, and emotional labor have higher than 10% ICC in the unconditional model. After controlling for the respective O*NET indicator, the reduction in ICC was indicative of agreement only on decision latitude and effort reward imbalance with lower percentage of reduction than in the healthcare-specific jobs (Table II).

No additional variable (demographic or SES indicator) reduced consistently or in more than 6% the ICC in any psychosocial exposure indicator (not shown).

In the healthcare-specific jobs, the multilevel regression analyses of survey-based indicators on their respective O*NET-based indicators (Table III) show that the intercepts

TABLE I. Spearman Correlation Coefficient and Intra-class Correlation Coefficients of Survey and O*NET-Based Psychosocial Indicators

	Healthcare-specific jobs (O*NET center) 12 jobs		Non-healthcare-specific jobs (O*NET center) 12 jobs	
Variables	Spearman coefficient (*P*-value)	Intra-class correlation (*P*-value)	Spearman coefficient (*P*-value)	Intra-class correlation (*P*-value)
Decision latitude	0.58 (0.080)	0.61 (0.028)	0.40 (0.199)	0.47 (0.059)
Psychological demand	0.76 (0.006)	0.11 (0.005)	0.31 (0.330)	0.07 (0.283)
Job strain	0.55 (0.098)	0.14 (0.536)	0.11 (0.729)	0.09 (0.334)
Supervisor support	0.24 (0.498)	0.27 (0.079)	−0.13 (0.683)	−0.18 (0.818)
Coworker support	0.04 (0.919)	−0.09 (0.510)	−0.13 (0.669)	−0.16 (0.761)
Rewards	0.47 (0.166)	0.41 (0.049)	0.13 (0.697)	−0.78 (0.601)
Effort reward ratio	0.88 (0.0008)	0.53 (0.004)	0.48 (0.112)	0.52 (0.039)
Emotional labor	0.07 (0.831)	0.08 (0.394)	−0.28 (0.383)	0.08 (0.488)

Job level data (24 jobs using O*NET classification system with 5 or more survey respondents; Healthcare workers, Massachusetts).

TABLE II. Comparison of Intra-class Correlation Between Unconditional Regression Models of Questionnaire Indicator of Psychosocial Exposure and Crude Regression Model Using O*NET Psychosocial Exposure as Independent Variable (Healthcare Workers, Massachusetts)

		Questionnaire indicator between-jobs variability and intra-class correlation (proportion of between-job variability over total variability)						
		Unconditional model			O*NET indicator as fixed effect model			
Type of job	Variables	Variability between	Variability within	ICC (%)	Variability between	Variability within	ICC (%)	Proportion of reduction (%)
Healthcare-specific jobs	Decision latitude	37.4	177.1	17.4	8.7	179.3	4.6	73.5
	Psychological demand	18.9	264.4	6.7	9.3	263.9	3.4	48.9
	Job strain	0.0	0.2	7.1	0.0	0.2	3.2	55.5
	Supervisor support	0.0	531.4	0.0	0.0	543.3	0.0	
	Coworker support	0.0	312.8	0.0	0.0	311.7	0.0	
	Rewards	13.4	417.4	3.1	10.4	419.2	2.4	22.3
	Effort reward imbalance	0.0	1.3	0.0	0.0	1.3	0.0	
	Emotional labor	5.0	44.0	10.3	1.0	448.0	0.2	97.9
Generic jobs	Decision latitude	115.5	159.5	42.0	88.1	159.2	35.6	15.2
	Psychological demand	37.2	179.8	17.1	39.3	180.0	17.9	−4.6
	Job strain	0.1	1.3	4.8	0.1	1.3	5.6	−17.5
	Supervisor support	20.8	363.4	5.4	25.8	361.8	6.7	−22.9
	Coworker support	0.0	296.8	0.0	0.0	297.9	0.0	
	Rewards	13.2	296.5	4.3	20.0	295.1	6.3	−48.9
	Effort reward imbalance	0.013	1.0	1.3	0.009	1.0	0.9	29.5
	Emotional labor	44.1	378.8	10.4	53.5	378.5	12.4	−18.7

TABLE III. Crude Multilevel Intercepts and Regression Coefficients of O*NET Psychosocial Exposure Indicators on Questionnaire Psychosocial Exposure Indicators

	Healthcare-specific jobs (12 jobs, 215 workers)		Generic jobs (12 jobs, 146 workers)	
Variables	Crude intercept (confidence interval)	Crude regression coefficients (confidence interval)	Crude intercept (confidence interval)	Crude regression coefficients (confidence interval)
Decision latitude	39.3 (29.2, 49.4)	0.4 (0.2, 0.5)	40.5 (21.3, 59.8)	0.3 (0.008, 0.6)
Psychological demand	11.3 (−22.3, 45.0)	0.4 (0.1, 0.6)	41.9 (17.4, 66.4)	0.1 (−0.1, 0.3)
Job strain ratio	0.4 (0.1, 0.8)	0.8 (0.4, 1.2)	0.8 (0.3, 1.3)	0.3 (−0.4, 1.03)
Supervisor support	57.8 (40.1, 75.5)	0.11 (−0.2, 0.4)	84.5 (47.0, 121.9)	−0.25 (−0.8, 0.3)
Coworker support	65.9 (48.2, 83.6)	0.08 (−0.1, 0.2)	80.4 (67.4, 93.4)	−0.2 (−0.3, −0.01)
Rewards	31.9 (2.0, 61.8)	0.4 (−0.01, 0.9)	59.0 (33.4, 84.6)	−0.05 (−0.4, 0.3)
Effort reward imbalance ratio	−0.1 (−1.1, 0.8)	0.6 (0.2, 1.0)	−0.04 (−1.3, 1.2)	0.7 (−0.01, 1.4)
Emotional labor	61.7 (51.5, 71.8)	−0.1 (−0.3, 0.03)	54.3 (35.4, 73.2)	−0.02 (−0.4, 0.3)

Stratified by healthcare specificity of the jobs. Multilevel data. Only workers on jobs with 5 or more survey respondents (Healthcare Workers, Massachusetts).

tended to be positive; however, two of them included the zero value in their confident interval (psychological demand and ER ratio). Almost all the central values of regression coefficients tended to be positive except emotional labor. The highest significant slopes are for job strain ratio and ER ratio, followed by psychological demand and supervisor support. In this stratum, ER ratio and psychological demand seems to have the best agreement, both intercepts contain the zero value and their slopes are positive and significant.

In the generic jobs stratum, only the ER ratio intercept contained the zero value and it had also an almost significant and substantially high and positive slope. The intercept for decision latitude shows a significant positive agreement.

ER ratio seems to have the best level of agreement across type of jobs.

DISCUSSION

In a sample of hospital and nursing home workers, job and multilevel analyses between survey and O*NET measurements of psychosocial exposure showed consistent agreement among specific-to-healthcare jobs; between non-healthcare-specific jobs, the levels of agreement were low. However, the ER ratio showed agreement also in generic jobs. Due to the small sample size (12 jobs for each stratum of healthcare specificity of the job), only very high correlation coefficients resulted statistically significant in job level analyses.

Comparison of Our Main Findings With Other Studies

The agreement at the job level is consistently good when compared against other studies. In the WOLF Study [Hasselhorn et al., 2002], four different assessment methods of decision latitude and psychological demand were used in 2,275 working men. Work group mean (one of the methods) had the best mean correlation ($r = 0.74$) with the other three methods (self-report, expert rating, and job exposure matrix). In relation to psychological demand, the work group mean had the best average again, but with lower correlation coefficients ($r = 0.35$). WOLF study results showed that correlation indexes between an exposure matrix and self-report were lower than the results obtained comparing group mean with the other methods. In our study, job level psychological demand and ER ratio hold higher correlation coefficients at the healthcare-specific group than the highest one observed at the WOLF study.

Ostry [Ostry et al., 2001] found a between-observers ICC of 0.75 for decision latitude and 0.23 for psychological demand, not much higher than ours, which compared different methods, not only different observers as Ostry did. The difference in the magnitude of total agreement for these variables described also by Karasek et al. [1998] is also seen in our study.

Schwartz [Schwartz et al., 1988] stated that correlation coefficients around 0.76 and 0.51 were ''acceptably high'' due to different methodologies and contents in the comparison of three national surveys and some isolated DOT items referring to the same concepts. We obtained even higher correlation coefficient values at the job level and using different exposure measurement sources.

At the multilevel models, only decision latitude, psychological demand, and emotional labor had a recognizable level (>10%) of between-occupation variability on survey indicators. In general, this shows low clustering of self-reported working conditions by job in both types of job. However, in the healthcare-specific jobs their average is properly represented by O*NET, as shown by the job level agreement and also by the reduction of ICC. This allows

stating that O*NET derived variables could be used as group level indicators of psychosocial exposure, especially for healthcare-specific jobs. However, there is no evidence to support them as good indicators of exposure for generic jobs.

The different indicators of multilevel agreement (reduction of ICC, intercept, and regression coefficient) did not show consistent results for all variables. For example, ER ratio does not have between jobs variability (agreement cannot even being studied), but it has zero intercept in specific and non-specific healthcare jobs and a significant positive slope in specific jobs. The reason for this divergence in results may be due to the regression coefficients being measures of 'consistency of agreement' more than measures of total agreement. Psychological demands, followed by decision latitude and job strain ratio seem the most consistent agreements.

On the other hand, we did not find a good predictor of within-occupation variability (not shown), and therefore we cannot formally use poor predictors to adjust for them and correct eventual disagreements.

Information Bias

Disadvantages of using an external database as source of exposure are its susceptibility to be used out of context and eventual misclassification because of aggregating information about an occupation across different economic sectors may mask variability [Schwartz et al., 1988]. Variability among economic sectors and among individuals is not considered by this method, which uses only job averages. This introduces misclassification, which in this case should lead to poor inter-methods agreement.

The original provider of information for the O*NET database, expert analyst or incumbent, could imply advantages and/or disadvantages. First, expert analysts are not affected as much by workplace related culture as job incumbents are, and this could result in a less biased estimation of some culturally sensitive attributes. Second, analysts are able to compare many work environments; whereas incumbents have little opportunity to calibrate their own ratings. Third, job analysts might not have their knowledge updated about some workplaces. Fourth, in general the analyst could better describe simple jobs (janitor) than complex jobs (nurse aide). The last two situations could lead to misclassification while the first two could lead to data with less systematic errors. Our data only has half of one O*NET indicator built from job incumbent variables (emotional labor); there is not enough contrast to test whether the source of O*NET data (job incumbent or analyst) makes any difference in the agreement.

A second eventual problem related to information bias is the generation and computation of psychosocial indicators. Both, O*NET and our questionnaire have information that allows an empirical comparison between different sources about exposures contained in the DC and the ER models. Although the approaches to compare these two sources differ from the original questionnaires recommend by the DC (Karasek) and ER (Siegrist) model authors, the conceptual bases are the same and, according to our opinion, the underlying theories were properly represented.

Related to the previous paragraph, the Effort Reward Imbalance model and emotional labor were affected the most. In the questionnaire, only three questions were used to evaluate rewards and effort was replaced by psychological demands; only two questions evaluated emotional demands. This could hurt the reliability of our measurement of these dimensions and could have created misclassification, decreasing the magnitude of the observed agreements.

On the O*NET side, there was a multiplicity of items to use and all the possible combinations and weights to compute scales deserve further comparative research. The high level of internal consistency of O*NET scales measured through Cronbach's alpha is not necessarily a guarantee against departures from the conceptual models that underlie the building of the scales. Conceptual and empirical validations of O*NET-derived indicators are still needed to improve and ensure their quality.

Selection Bias

It is possible that our results were influenced by some not-under-study characteristics of our workers, jobs, and/or facilities. Those facilities that accepted to participate in our study represented a group that was not necessarily similar to those that refused. It could be surmised that participant facilities are more concerned about and have a better level of working conditions. The same line of thought can be followed for included and non-included jobs. However, our analyses do not show support for this assertion. Those jobs that were included in our study did not have clear higher or lower exposure than the non-included jobs. Specific-to-healthcare included jobs had more psychological demand, which is a risk factor in one model (DC), but they also have more rewards, which is a protective factor in another model (ER). No clear inference can be performed from these differences between included and excluded jobs. Additionally, information about non-participation in O*NET data collection process would allow a better interpretation of comparisons like those performed in this study.

The survey that was used to obtain questionnaire indicators received only 29.5% of response. A considerable part of the non-response is still unexplained, and, consequently, the full effects of an eventual bias are unknown. The respondents are older, have lower levels of job strain, and higher SES than the non-respondents. Overall, it is our assumption that this low response rate underestimates agreement in this study because the questionnaire values represented a selected group of healthcare workers who were

not rewarded for their participation while O*NET values represent a rewarded (and presumably less selected) group of workers [Cifuentes et al., 2005].

Weaknesses and Strengths

Because our exposure measurements used different items to measure the same concept, we should expect that our results are a non-verifiable underestimation of the agreement.

Also, it is not possible to evaluate the impact of different sources of systematic and non-systematic error in this study as they could increase or reduce the agreement.

At the job level, this study did not have enough power to test correlation coefficients and ICCs without underestimating the level of agreement. However, the results were so consistent that they allowed a general fair interpretation.

The main strength of this study is a comparison between two methods from different sources stratifying by sector-specificity of the jobs. The fact that O*NET was not intended for measuring working conditions became a strength because it decreased the likelihood of prior hypotheses interference during data collection (expert analyst bias).

Future research could consider using O*NET as a source of psychosocial working condition exposure at the job level. It would be interesting to extend this study to other economic sectors and also would be advisable to test different formulations to conceptually and operationally capture the DC and ER models' components and test predictive validity of these indicators by combining O*NET indicators with health data.

CONCLUSION

O*NET and survey data showed an important inter-methods agreement at the job and multi level in measuring psychosocial exposure in healthcare-specific jobs at three healthcare facilities in Massachusetts. Non-healthcare-specific jobs do not show such good level of agreement. These findings make more feasible the utilization of O*NET as a job level psychosocial exposure matrix, particularly at the healthcare sector as job level exposure. The identification of other economic sectors with high level of agreement between O*NET and questionnaire (or other local method of measuring psychosocial exposure) could transform O*NET in a valuable tool to obtain information about psychosocial exposure. Studies about improved O*NET indicators of psychosocial exposure, predictive validity of these indicators, and the inclusion of information considering economic sector could result in an even easier transformation of O*NET in a reliable source of psychosocial work exposure. The availability of psychosocial exposure measurements when the job title is known, could allow enrichment of work-related exposure information.

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