

Bucknell University

## Bucknell Digital Commons

---

Faculty Journal Articles

Faculty Scholarship

---

2015

### Is Any Job Better than No Job? Labor Market Experiences and Depressive Symptoms in People Living with HIV

Sergio Rueda  
*University of Toronto*

Peter Smith  
*Monash University*

Tsegaye Bekele  
*Ontario HIV Treatment Network*

Kelly O'Brien  
*University of Toronto*

Winston Husbands  
*University of Toronto*

*See next page for additional authors*

Follow this and additional works at: [https://digitalcommons.bucknell.edu/fac\\_journ](https://digitalcommons.bucknell.edu/fac_journ)

---

#### Recommended Citation

Rueda, Sergio; Smith, Peter; Bekele, Tsegaye; O'Brien, Kelly; Husbands, Winston; Li, Alan; Jose-Boerbridge, Murray; Mittmann, Nicole; Rachlis, Anita; Conyers, Liza; Boomer, K B.; and O'Rourke, Sean. "Is Any Job Better than No Job? Labor Market Experiences and Depressive Symptoms in People Living with HIV." *AIDS Care: Psychological and Socio-Medical Aspects of AIDS/HIV* (2015) .

This Article is brought to you for free and open access by the Faculty Scholarship at Bucknell Digital Commons. It has been accepted for inclusion in Faculty Journal Articles by an authorized administrator of Bucknell Digital Commons. For more information, please contact [dcadmin@bucknell.edu](mailto:dcadmin@bucknell.edu).

---

**Authors**

Sergio Rueda, Peter Smith, Tsegaye Bekele, Kelly O'Brien, Winston Husbands, Alan Li, Murray Jose-Boerbridge, Nicole Mittmann, Anita Rachlis, Liza Conyers, K B. Boomer, and Sean O'Rourke



[Click for updates](#)

## AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/caic20>

### Is any job better than no job? Labor market experiences and depressive symptoms in people living with HIV

Sergio Rueda<sup>abc</sup>, Peter Smith<sup>cde</sup>, Tsegaye Bekele<sup>a</sup>, Kelly O'Brien<sup>fg</sup>, Winston Husbands<sup>eh</sup>, Alan Li<sup>i</sup>, Murray Jose-Boerbridge<sup>j</sup>, Nicole Mittmann<sup>kl</sup>, Anita Rachlis<sup>m</sup>, Liza Conyers<sup>n</sup>, K.B. Boomer<sup>o</sup>, Sean B. Rourke<sup>abp</sup> & the ECHO Study Team

<sup>a</sup> Ontario HIV Treatment Network, Toronto, ON, Canada

<sup>b</sup> Department of Psychiatry, University of Toronto, ON, Canada

<sup>c</sup> Institute for Work and Health, Toronto, ON, Canada

<sup>d</sup> School of Public Health and Preventive Medicine, Monash University, VIC, Australia

<sup>e</sup> Dalla Lana School of Public Health, University of Toronto, Toronto, ON, Canada

<sup>f</sup> Department of Physical Therapy, University of Toronto, Toronto, ON, Canada

<sup>g</sup> Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, ON, Canada

<sup>h</sup> AIDS Committee of Toronto, Toronto, ON, Canada

<sup>i</sup> Committee for Accessible AIDS Treatment, Regent Park Community Health Centre, Toronto, ON, Canada

<sup>j</sup> Toronto People with AIDS Foundation, Toronto, ON, Canada

<sup>k</sup> Health Outcomes and PharmacoEconomic (HOPE) Research Centre, Sunnybrook Health Sciences Centre, Toronto, ON, Canada

<sup>l</sup> Department of Pharmacology, University of Toronto, Toronto, ON, Canada

<sup>m</sup> Department of Medicine, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, ON, Canada

<sup>n</sup> Department of Educational Psychology, Counseling & Special Education, Pennsylvania State University, University Park, PA, USA

<sup>o</sup> Department of Mathematics, Bucknell University, Lewisburg, PA, USA

<sup>p</sup> Centre for Research on Inner City Health, The Keenan Research Centre, Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, ON, Canada

Published online: 04 Mar 2015.

To cite this article: Sergio Rueda, Peter Smith, Tsegaye Bekele, Kelly O'Brien, Winston Husbands, Alan Li, Murray Jose-Boerbridge, Nicole Mittmann, Anita Rachlis, Liza Conyers, K.B. Boomer, Sean B. Rourke & the ECHO Study Team (2015): Is any job better than no job? Labor market experiences and depressive symptoms in people living with HIV, *AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV*, DOI: [10.1080/09540121.2015.1015479](https://doi.org/10.1080/09540121.2015.1015479)

To link to this article: <http://dx.doi.org/10.1080/09540121.2015.1015479>

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

## Is any job better than no job? Labor market experiences and depressive symptoms in people living with HIV

Sergio Rueda<sup>a,b,c,\*</sup>, Peter Smith<sup>c,d,e</sup>, Tsegaye Bekele<sup>a</sup>, Kelly O'Brien<sup>f,g</sup>, Winston Husbands<sup>e,h</sup>, Alan Li<sup>i</sup>, Murray Jose-Boerbridge<sup>j</sup>, Nicole Mittmann<sup>k,l</sup>, Anita Rachlis<sup>m</sup>, Liza Conyers<sup>n</sup>, K.B. Boomer<sup>o</sup>, Sean B. Rourke<sup>a,b,p</sup> and the ECHO Study Team

<sup>a</sup>Ontario HIV Treatment Network, Toronto, ON, Canada; <sup>b</sup>Department of Psychiatry, University of Toronto, ON, Canada; <sup>c</sup>Institute for Work and Health, Toronto, ON, Canada; <sup>d</sup>School of Public Health and Preventive Medicine, Monash University, VIC, Australia; <sup>e</sup>Dalla Lana School of Public Health, University of Toronto, Toronto, ON, Canada; <sup>f</sup>Department of Physical Therapy, University of Toronto, Toronto, ON, Canada; <sup>g</sup>Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, ON, Canada; <sup>h</sup>AIDS Committee of Toronto, Toronto, ON, Canada; <sup>i</sup>Committee for Accessible AIDS Treatment, Regent Park Community Health Centre, Toronto, ON, Canada; <sup>j</sup>Toronto People with AIDS Foundation, Toronto, ON, Canada; <sup>k</sup>Health Outcomes and PharmacoEconomic (HOPE) Research Centre, Sunnybrook Health Sciences Centre, Toronto, ON, Canada; <sup>l</sup>Department of Pharmacology, University of Toronto, Toronto, ON, Canada; <sup>m</sup>Department of Medicine, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, ON, Canada; <sup>n</sup>Department of Educational Psychology, Counseling & Special Education, Pennsylvania State University, University Park, PA, USA; <sup>o</sup>Department of Mathematics, Bucknell University, Lewisburg, PA, USA; <sup>p</sup>Centre for Research on Inner City Health, The Keenan Research Centre, Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, ON, Canada

(Received 7 May 2014; accepted 20 January 2015)

The purpose of this study is to determine the relationship between the psychosocial work environment and labor market experiences (including unemployment) on mental health among adults living with HIV. We used data provided by 538 participants at clinical and community sites across Ontario, Canada. Generalized estimating equation models showed that employment was associated with lower depressive symptoms. For employed participants, adverse psychosocial work conditions, specifically job insecurity, psychological demands, and decision authority were associated with depressive symptoms. For the entire sample, the number of adverse psychosocial work conditions was associated with higher depressive symptoms while participants working in poor quality jobs reported similar levels of depressive symptoms than those who were unemployed or not in the labor force. This study showed that poor quality employment (as assessed by having a high number of adverse psychosocial work exposures) was associated with a similar level of depressive symptoms as unemployment, suggesting that “bad jobs” may not offer the same mental health benefits as “good jobs.” Policies to improve employment outcomes should take the quality of employment into account to maximize mental health benefits as better employment may lead to better mental health.

**Keywords:** HIV; employment; psychosocial work conditions; depressive symptoms

### Introduction

Major depression is one of the top three causes of disability burden in high-income countries (Lopez, Mathers, Ezzati, Jamison, & Murray, 2006). People living with HIV are at an increased risk for depression, twice that of the general population (Israelski et al., 2007). Depression or depressive symptoms have been associated with accelerated HIV disease progression, lower quality of life, and mortality (Farinpour et al., 2003). The burden of depression could be reduced by identifying variables that are amenable to intervention. Participation in the labor market (i.e., the availability of work) and the psychosocial work environment (i.e., the nature or quality of work) have been identified as some of those predictors that are amenable to change (Rueda, Chambers, et al., 2012; Stansfeld & Candy, 2006).

Studies have shown that the availability of work is associated with better physical and mental health in people living with HIV (Rueda et al., 2011; Rueda, Raboud, Plankey, et al., 2012; Worthington & Krentz, 2005). This restricted conceptualization of the labor market experience – as the simple distinction between employment vs. unemployment – seems reasonably well grounded in the classic work of Jahoda's functional model, whereby unemployment has a negative effect on health due to the absence of a number of material and latent functions related to paid work (e.g., jobs provide income, time structure, connection to goals that transcend our own, identity, status, and position within society; Jahoda, 1981). However, this approach can be criticized for holding a romanticized view of the labor market experience by failing to recognize that certain types of employment may be detrimental to health (Ezzy, 1993).

\*Corresponding author. Email: [sergio.rueda@utoronto.ca](mailto:sergio.rueda@utoronto.ca)

In this sense, studies examining the beneficial effects of labor force participation that are exclusively focused on the dichotomy of employment vs. unemployment may leave the impression that – relative to unemployment – any type of employment is of benefit to health. Yet, studies have identified that certain characteristics of the work environment have a detrimental impact on health. One such model is the Demand-Control-Support Model, which has shown that adverse psychosocial work conditions, such as high psychological or physical demands, low decision-making authority or skill discretion, low social support from supervisors or coworkers, and job insecurity lead to poor physical and mental health (De Lange, Taris, Kompier, Houtman, & Bongers, 2003; Karasek et al., 1998).

This paper attempts to address a substantial gap in the HIV literature by exploring the relationships between varying employment conditions and mental health. Our aim is to conceptually expand on previous papers that merely examined the health impact of the availability of work in the context of HIV/AIDS (Rueda et al., 2011; Rueda, Raboud, Plankey, et al., 2012). Our objectives were to determine the relationship between employment status, psychosocial work conditions, and quality of employment on depressive symptoms for adults living with HIV. Building on previous research from the general population (Broom et al., 2006; Butterworth et al., 2011; Grzywacz & Dooley, 2003), this paper explores a wider continuum of employment conditions that include both the availability (employment status) and the quality of employment (psychosocial work conditions). We hypothesize that, while being employed will be associated with better mental health, the quality of employment will also make a difference in health. In other words, only good quality work will be associated with better mental health. Specifically, we hypothesize that after controlling for potential confounders: (1) employed participants will report lower depressive symptoms than nonemployed participants (including those who are unemployed and those who are out of the labor market); (2) depressive symptoms for employed participants will vary according to the quality of the psychosocial work environment – i.e., better psychosocial work conditions will be associated with lower depressive symptoms; and (3) only those participants who are employed in good quality jobs will report lower depressive symptoms, with unemployed participants and those working in poor quality jobs reporting similar levels of depressive symptoms. To our knowledge, this is the first study to explore in people with HIV whether “bad jobs” are as detrimental to mental health as not having a job at all.

## Methods

### *Study population*

This study presents data from the Employment Change and Health Outcomes (ECHO) study. This longitudinal

cohort study collects clinical, sociodemographic, and labor force participation data on people with HIV from 2 clinical sites and 13 AIDS service organizations in the province of Ontario, Canada. Eligible participants were adults living with HIV who are residents of Ontario. The Research Ethics Boards of the University of Toronto, Sunnybrook Health Sciences, and St. Michael’s Hospital approved this study.

### *Measures*

A structured interview was used to collect sociodemographic data. The burden of depressive symptoms was assessed using the Center for Epidemiologic Studies Depression Scale (CES-D), which consists of 20 items assessing the frequency of depressive symptoms over the past week (Radloff, 1977). Psychosocial work conditions were assessed using the Job Content Questionnaire, which is a 49-item questionnaire (organized in eight subscales) designed to measure the content of a respondent’s work tasks and focuses on the psychological and social structure of the work situation (Karasek et al., 1998; Appendix 1).

### *Statistical analysis*

In this paper, we present data collected between January 2010 and February 2012 through interviewer–administered questionnaires at baseline and 12 months later. We used generalized estimating equation (GEE) linear regression methods with exchangeable correlation structure to conduct analyses of all available data to account for repeated measures from the same respondents (Liang & Zeger, 1986; Twisk, 2003). We fitted multivariable GEE models with those covariates that showed the strongest relationship with depressive symptoms in bivariate models ( $p$ -values  $\leq 0.10$ ) while paying attention to potential effect modifiers. For the second hypothesis, however, we included all psychosocial work condition variables in the final regression model because we were interested in identifying all subscales that were independently associated with depressive symptoms.

We fitted three separate multivariable regression models to test our hypotheses. In the first model, we created a binary variable for employment status (i.e., employed vs. nonemployed). The employed group consisted of participants who were working for taxable income while the nonemployed group included those who were unemployed at the time of the interview, those who were working under the table or in the informal economy, and those who were not in the labor force (i.e., those who were unemployed, but not seeking work, and students; Hypothesis 1). In the second model, we included only those participants who were employed for taxable income to examine the association between psychosocial

work conditions and depressive symptoms as these data are only available from employed participants (Hypothesis 2). In the final model, all participants were included to test the association between the employment continuum and depressive symptoms (Hypothesis 3). For those who were employed, we created three categories of employment quality based on the summary scores of psychological demands, decision authority, and job insecurity subscales (which were the dimensions most strongly associated with depressive symptoms in the previous model tested in Hypothesis 2). We dichotomized the scores at the first quartile following previous research in this area (Butterworth et al., 2011). We then created a summary measure by adding the numbers of adverse psychosocial work conditions (i.e., psychological demands, decision authority, and job insecurity subscales), and we classified them into three categories: no adverse work condition (optimal employment), one adverse condition (adequate employment), and two or more adverse conditions (inadequate employment). In this frame of reference, we presume optimal and adequate employment represent “good jobs” that are free from average psychosocial work exposures while jobs that have a number of negative psychosocial work exposures (inadequate employment) represent “bad jobs.” Examining the additive effects of psychosocial work exposures in this way is consistent with many studies in the area of psychosocial work conditions and health, which demonstrate that different psychosocial exposures have independent effects on health outcomes (Broom et al., 2006; Head et al., 2007; Kivimäki, Vahtera, Elovainio, Virtanen, & Siegrist, 2007). All analyses were performed using SAS 9.3 (SAS Institute Inc., Cary, North Carolina).

## Results

### Participants

The study sample included a total of 538 people living with HIV. At enrollment, the employment continuum included 17% of the sample in optimal employment, 16% in adequate employment, 17% in inadequate employment, 28% unemployed, and 23% not in the labor force (Table 1). To maximize the use of available data, we included in our analyses all data collected from participants at two subsequent visits (both at baseline and at follow-up) to address Hypotheses 1 and 3. For the analysis restricted to employed participants (Hypothesis 2), we used all available data from those participants who were employed at baseline and/or follow-up. There were 266 participants (out of 538, or 49%) who were employed at baseline and provided information on psychosocial work conditions. Of these 266 employed participants at baseline, 155 were also employed at follow-up. In addition, 46 participants who were

unemployed at baseline returned to work at follow-up and also provided data on psychosocial work conditions. Thus, the restricted sample to address the second hypothesis included 312 employed participants (i.e., those participants who were employed either at baseline or at follow-up) for a total of 467 observations (266 observations from employed participants at baseline, 155 observations from employed participants at follow-up, plus 46 participants who returned to work at follow-up).

### *Associations between employment status, psychosocial work conditions, and depressive symptoms (Hypotheses 1 and 2)*

Table 2 presents the results of the multivariable model for employment status as predictor of depressive symptoms in the entire sample. This model showed that employment status was associated with lower depressive symptoms after controlling for gender, education, personal income, and time since HIV diagnosis.

Table 3 presents the bivariate and multivariable models for psychosocial work conditions as predictors of depressive symptoms in the employed sample. In the multivariable regression analysis, higher levels of job insecurity and higher levels of psychological demands were significantly associated with greater levels of depressive symptoms. Higher levels of decision authority were marginally associated with lower levels of depressive symptoms. Among the sociodemographic covariates included in the final multivariable model, only income remained significantly associated with depressive symptoms.

### *Associations between the employment continuum (quality of employment) and depressive symptoms (Hypothesis 3)*

Table 4 presents the final model for the continuum of employment conditions (i.e., optimal employment, adequate employment, inadequate employment, unemployment, and not in the labor force) as a predictor of depressive symptoms. Relative to inadequate employment, and after adjusting for gender, level of education, personal income, and years since HIV diagnosis, optimal employment and adequate employment were associated with lower depressive symptoms while unemployed and participants out of the labor force reported similar levels of depressive symptoms to inadequate employment.

## Discussion

We found support for the three hypotheses examined in this study. First, we found that employment is associated with lower depressive symptoms in people living with HIV. This finding is in agreement with previous studies that have shown clinically meaningful cross-sectional

Table 1. Baseline characteristics of study participants ( $N = 538$ ).

Characteristics	Employment continuum at baseline						<i>p</i> -value*
	Total sample ( $N = 538$ )	Optimal employment ( $n = 91$ )	Adequate employment ( $n = 84$ )	Inadequate employment ( $n = 91$ )	Unemployed ( $n = 150$ )	NILF ( $n = 122$ )	
Age in years (mean, SD) <sup>g,h,i</sup>	45.6 (9.4)	45.3 (9.5)	44.1 (8.1)	43.3 (9.9)	47.1 (9.0)	47.9 (9.6)	0.001
Gender (male)	370 (69%)	68 (75%)	64 (77%)	54 (59%)	106 (71%)	78 (65%)	0.052
Education ( $\geq$ high school completion) <sup>c,d,f,g,h</sup>	456 (85%)	88 (97%)	79 (95%)	82 (90%)	118 (79%)	89 (74%)	<0.001
Sexual orientation (gay/lesbian/bisexual) <sup>b,c,d,f</sup>	308 (58%)	64 (70%)	54 (65%)	47 (52%)	76 (51%)	67 (55%)	0.014
Race/ethnicity (Caucasian)	317 (59%)	61 (67%)	54 (65%)	52 (57%)	85 (57%)	65 (54%)	0.239
Country of birth (Canada)	360 (67%)	61 (67%)	55 (66%)	56 (62%)	100 (67%)	88 (73%)	0.547
Years since HIV diagnosis (mean, SD) <sup>c,d,h,i</sup>	12.7 (7.1)	11.2 (7.2)	13.0 (6.8)	11.4 (6.9)	13.5 (7.1)	13.6 (7.1)	0.029
Personal income (<30,000/year) <sup>a,b,c,d,e,g,j</sup>	347 (65%)	39 (43%)	21 (26%)	53 (59%)	129 (86%)	105 (87%)	<0.001
Live in the Greater Toronto Area (yes)	314 (59%)	59 (65%)	53 (64%)	52 (57%)	82 (55%)	68 (56%)	0.438
Depressive symptoms (mean, SD) <sup>b,c,d,e,g,j</sup>	15.0 (12.9)	11.5 (11.8)	9.6 (9.7)	15.9 (14.3)	15.8 (11.8)	19.6 (14.3)	<0.001

NILF, not in the labor force; SD, standard deviation.

<sup>a</sup> $p < 0.05$  (optimal employment vs. adequate employment).

<sup>b</sup> $p < 0.05$  (optimal employment vs. inadequate employment).

<sup>c</sup> $p < 0.05$  (optimal employment vs. unemployment).

<sup>d</sup> $p < 0.05$  (optimal employment vs. NILF).

<sup>e</sup> $p < 0.05$  (adequate employment vs. inadequate employment).

<sup>f</sup> $p < 0.05$  (adequate employment vs. unemployment).

<sup>g</sup> $p < 0.05$  (adequate employment vs. NILF).

<sup>h</sup> $p < 0.05$  (inadequate employment vs. unemployment).

<sup>i</sup> $p < 0.05$  (inadequate employment vs. NILF).

<sup>j</sup> $p < 0.05$  (unemployment vs. NILF).

\*Pearson chi-square and analysis of variance tests.

Table 2. Multivariable regression model for employment status as predictor of depressive symptoms in the entire sample ( $N = 538$ ; observations = 967).

Predictors	B	(95% CI)	<i>p</i>
Intercept	15.45	(11.95, 18.95)	<0.001
Employment status (employed vs. nonemployed)	-3.11	(-5.35, -0.86)	0.007
Gender (female/transgender)	1.92	(-0.20, 4.04)	0.076
Education ( $\geq$ high school completion)	-2.41	(-5.41, 0.58)	0.114
Personal income (<30 k/year)	1.95	(-0.25, 4.15)	0.083
Years since HIV diagnosis	-0.07	(-0.21, 0.07)	0.346

Note: The nonemployed group included those who were unemployed at the time of the interview, those who were working under the table or in the informal economy, and those who were not in the labor force (i.e., those who were unemployed, but not seeking work, and students).

and longitudinal associations between employment status and both physical and mental health-related quality of life in people with HIV (Rueda et al., 2011; Rueda, Raboud, Plankey, et al., 2012). These previous studies, having found that the relationship between employment and physical health was more pronounced than mental health, suggested an adaptation to the experience of unemployment that is reflected in the mental health component of quality of life. The present finding however reinforces the notion that employment is significantly related to mental health by using a valid and reliable measure of depressive symptoms, a more tangible measure of mental health. This association remains significant after controlling for potential confounders, most notably education and income, suggesting that employment plays a positive role on mental health beyond those provided by past educational experiences and current income.

Table 4. Multivariable model for the continuum of employment conditions as predictor of depressive symptoms in the entire sample ( $N = 538$ ; observations = 967).

Predictors	B	(95% CI)	<i>p-value</i>
Intercept	15.53	(12.18, 18.87)	<0.001
Employment conditions			
Optimal employment	-3.52	(-6.55, -0.49)	0.023
Adequate employment	-4.74	(-7.59, -1.89)	0.001
Inadequate employment (ref)	-	-	-
Unemployed	-0.45	(-3.57, 2.67)	0.778
Not in the labor force	1.38	(-1.96, 4.72)	0.418

Note: This model was adjusted for gender, education, personal income, and time since HIV diagnosis.

Second, we found that the main adverse psychosocial work conditions for people with HIV working in the formal economy are job insecurity, high psychological demands, and low decision authority. The finding of the independent association between job insecurity and depressive symptoms is consistent with a previous study that, correspondingly, found *job security* to be associated with *better* mental health in men living with HIV (Rueda, Raboud, Rourke, et al., 2012). This suggests that the psychological burden of work can arise as a result of adapting to labor market dynamics and that the level of security the job is perceived to have and the prospects for career development and promotions do matter to mental health. The finding that high psychological demands are related to depressive symptoms is supported by longitudinal studies that have reported increases in psychological demands to be associated with an increased risk of depression in the general population (Andrea, Bültmann, van Amelsvoort, & Kant, 2009; Smith & Bielecky, 2012). This suggests that jobs that are characterized by fast work pace and mental intensity combined with high levels of conflicting

Table 3. Bivariate (unadjusted) and multivariable (adjusted) regression models for psychosocial work conditions as predictors of depressive symptoms in the employed sample ( $N = 312$ ; observations = 458).

Predictors	Bivariate models			Multivariable model		
	B	(95% CI)	<i>p-value</i>	B	(95% CI)	<i>p-value</i>
Intercept				13.17	(7.23, 19.10)	<0.001
Skill discretion	-0.99	(-2.10, 0.11)	0.078	0.89	(-0.52, 2.31)	0.217
Decision authority	-2.15	(-3.21, -1.09)	<0.001	-1.42	(-2.86, 0.02)	0.053
Marco-level decision authority	-1.69	(-2.79, -0.60)	0.003	-0.74	(-1.95, 0.46)	0.228
Psychological demands	1.05	(0.04, 2.05)	0.041	1.53	(0.24, 2.82)	0.019
Physical demands	0.74	(-0.34, 1.81)	0.179	0.70	(-0.61, 2.01)	0.293
Coworker support	-1.02	(-2.09, 0.05)	0.062	-0.08	(-1.22, 1.05)	0.889
Supervisor support	-0.57	(-1.74, 0.60)	0.338	0.03	(-1.14, 1.19)	0.966
Job insecurity	2.43	(1.30, 3.56)	<0.001	1.34	(0.17, 2.50)	0.024

Note: The multivariable model was adjusted for gender, education, and personal income.

demands may be detrimental to mental health. These longitudinal studies have also reported that psychological demands play a larger role in the development of depression than a low level of job control, comprising both low decision authority (control of decisions made at work) and skills discretion (variety of work and opportunity to use skills at work). We did find that high decision authority had a protective effect on depressive symptoms, although given the marginal strength of this association we suggest this finding should be further replicated in larger samples ideally under a longitudinal design.

Unlike previous studies (Bourbonnais, Comeau, & Vézina, 1999; Thielen, Nygaard, Rugulies, & Diderichsen, 2011), we did not find that low social support was associated with poorer mental health. The lack of effect of workplace social support in this study could reflect the male dominance of this sample, with some studies indicating that social support is a more important construct in the link between work stress and disease among women compared to men (Taylor et al., 2000). More work is required to determine if the lack of relationship between social support and mental health is specific to this sample or can be generalized to the population of labor market participants living with HIV.

Lastly, we found that the significant relationship between quality of employment and depressive symptoms seems restricted to adequate and optimal employment. This finding is also in agreement with few other studies conducted in the general population that have supported the notion that “bad jobs” may be as bad or even worse to health than “no jobs.” One of these studies, using data from two large US cross-sectional surveys representative of the national and California populations, found that less than optimal work, not only the lack of it, was related to poor physical and mental health among adults (Grzywacz & Dooley, 2003). Another study, using a large cross-sectional survey of mid-age Australians, found that poor quality jobs that contained one or more psychosocial stressors (i.e., job insecurity, low marketability, and/or job strain) could be as bad to health as unemployment (Broom et al., 2006). More recently, a study using population-based longitudinal data from Australia found that jobs with poor psychosocial quality were similar or even worse to mental health than unemployment (Butterworth et al., 2011). This paper found a linear relationship between the number of adverse employment conditions and mental health, while the mental health of those who were unemployed was often comparable or even *better* than those participants who were working in poor quality jobs. This study also found prospectively that while the mental health associated with the movement from unemployment to good quality jobs was significant, as expected, the movement from unemployment to poor

quality jobs was associated with *worse* mental health than remaining unemployed.

The results of this study should be interpreted in light of the following limitations. We had to conduct cross-sectional analyses of longitudinal data to increase our power to examine the complex associations between employment and depressive symptoms in HIV. This precludes us from making causal attributions about the relationships proposed in this study. It might be that people with HIV who are depressed may have a higher predisposition to report that their work is more psychologically demanding or perceive their jobs to be more insecure than participants who are experiencing lower levels of depressive symptoms. However, the associations between employment status, psychosocial work conditions, and depressive symptoms reported in this paper are not trivial and are consistent with a long tradition of research in the general population examining these associations in longitudinal contexts. In addition, we did not find weak consistent relationships across all dimensions of psychosocial work environment and mental health, suggesting that common-method bias (e.g., negative affectivity) is unlikely to explain our results (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Our study also has a number of strengths. It extends our understanding of the mental health impact of the psychosocial work environment by examining a broad range of potential adverse work conditions for the first time in the context of HIV. This study is also the first attempt at examining a wider continuum of employment conditions, which crucially incorporates the quality of work as a defining feature, as an important determinant of mental health in people living with HIV. We used individual-level data from a relatively diverse sample of people with HIV, and we sought to minimize the risk of residual confounding that has affected previous studies because this study was designed to collect comprehensive data on labor force participation and health in the context of HIV. This study also provides some justification to use more nuanced measures of the employment experience to capture the movement of people through different employment transitions.

In terms of policy implications, our previous findings on the strong associations between employment status and health-related quality of life suggested that policy should focus on offering employment opportunities for people with HIV. The findings from this study suggest that returning to work or gaining employment may not necessarily result in mental health gains if the quality of work is not also taken into account. Employment services and policies that are exclusively focused on job growth, or “work-first” as they are called in some jurisdictions, may result in important gains in employment outcomes, based on the notion that any job is better than no job. These policies however may inadvertently

miss the potential health-damaging effects of driving people into bad jobs, which expose workers to a number of negative psychosocial work exposures. Employers', front-line, and government efforts to create more adaptable work environments and services for people with HIV should take into consideration the quality of employment to accommodate the needs of workers living with HIV, so that they can sustain employment and take care of their health.

### Acknowledgments

The Employment Change and Health Outcomes (ECHO) Study Team consists of Dr Sergio Rueda (Principal Investigator), University of Toronto and OHTN; Dr Sean B. Rourke (Coprincipal Investigator), University of Toronto and OHTN; Dr Winston Husbands (Coprincipal Investigator), AIDS Committee of Toronto; Murray Jose-Boerbridge (Coprincipal Investigator), Toronto People with AIDS Foundation; Dr Alan Li (Coprincipal Investigator), Committee for Accessible AIDS Treatment and Regent Park Community Health Centre; Dr Nicole Mittmann and Dr Anita Rachlis, University of Toronto and Sunnybrook Health Sciences Centre; Dr Barry Adam, Jean Bacon, Tsegaye Bekele, and Maggie Shi, OHTN; Dr Kelly O'Brien and Dr Peggy Millson, University of Toronto; Dr Patty Solomon, Dr John Cairney, and Dr Mike Wilson, McMaster University; and Lori Lucier, Toronto Central Local Health Integration Network. We gratefully acknowledge all of the people living with HIV who volunteered to participate in this study and the work and support of ECHO's Peer Research Associates (D.B. Hintzen, Mary M., Rob Rollins, Scott de Blois, James Gough, Jasmine Cotnam, Wayne Bristow, Tim Walker, Mary Kato, Stephanie Smith, J. Lauzon, Rumaldo Rincon, Michael J. Hamilton, Andrew Miao, and Henry Luyombya) and the OHTN Cohort Study (OCS) data collectors (Shahryar Murshed, Rajendra Maharaj, and Paul MacPhee). The authors also wish to thank the following OCS investigators and staff for logistics, data linkage, and IT support: Dr Ann Burchell, Dr Sandra Gardner, and Dr Kevin Gough, and Kevin Challacombe, Robert Hudder, Lucia Light, Veronika Moravan, and Nahid Qureshi. ECHO was supported by a community-based research operating grant from the Canadian Institutes of Health Research.

### Disclosure statement

No potential conflict of interest was reported by the authors.

### References

- Andrea, H., Bültmann, U., van Amelsvoort, L. G. P. M., & Kant, Y. (2009). The incidence of anxiety and depression among employees—The role of psychosocial work characteristics. *Depression and Anxiety, 26*, 1040–1048. doi:10.1002/da.20516
- Bourbonnais, R., Comeau, M., & Vézina, M. (1999). Job strain and evolution of mental health among nurses. *Journal of Occupational Health Psychology, 4*(2), 95–107. doi:10.1037/1076-8998.4.2.95
- Broom, D. H., D'Souza, R. M., Strazdins, L., Butterworth, P., Parslow, R., & Rodgers, B. (2006). The lesser evil: Bad jobs or unemployment? A survey of mid-aged Australians. *Social Science & Medicine, 63*, 575–586. doi:10.1016/j.socscimed.2006.02.003
- Butterworth, P., Leach, L. S., Strazdins, L., Olesen, S. C., Rodgers, B., & Broom, D. H. (2011). The psychosocial quality of work determines whether employment has benefits for mental health: Results from a longitudinal national household panel survey. *Occupational and Environmental Medicine, 68*, 806–812. doi:10.1136/oem.2010.059030
- De Lange, A. H., Taris, T. W., Kompier, M. A. J., Houtman, I. L. D., & Bongers, P. M. (2003). "The very best of the millennium": Longitudinal research and the demand-control-(support) model. *Journal of Occupational Health Psychology, 8*, 282–305. doi:10.1037/1076-8998.8.4.282
- Ezzy, D. (1993). Unemployment and mental health: A critical review. *Social Science & Medicine, 37*(1), 41–52. doi:10.1016/0277-9536(93)90316-V
- Farinpour, R., Miller, E. N., Satz, P., Selnes, O. A., Cohen, B. A., Becker, J. T., ... Visscher, B. R. (2003). Psychosocial risk factors of HIV morbidity and mortality: Findings from the Multicenter AIDS Cohort Study (MACS). *Journal of Clinical and Experimental Neuropsychology, 25*, 654–670. doi:10.1076/jcen.25.5.654.14577
- Grzywacz, J. G., & Dooley, D. (2003). "Good jobs" to "bad jobs": Replicated evidence of an employment continuum from two large surveys. *Social Science & Medicine, 56*, 1749–1760. doi:10.1016/S0277-9536(02)00170-3
- Head, J., Kivimäki, M., Siegrist, J., Ferrie, J. E., Vahtera, J., Shipley, M. J., & Marmot, M. G. (2007). Effort-reward imbalance and relational injustice at work predict sickness absence: The Whitehall II study. *Journal of Psychosomatic Research, 63*, 433–440. doi:10.1016/j.jpsychores.2007.06.021
- Israelski, D. M., Prentiss, D. E., Lubega, S., Balmas, G., Garcia, P., Muhammad, M., ... Koopman, C. (2007). Psychiatric co-morbidity in vulnerable populations receiving primary care for HIV/AIDS. *AIDS Care, 19*, 220–225. doi:10.1080/09540120600774230
- Jahoda, M. (1981). Work, employment, and unemployment: Values, theories, and approaches in social research. *American Psychologist, 36*, 184–191. doi:10.1037/0003-066X.36.2.184
- Karasek, R., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., & Amick, B. (1998). The Job Content Questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health Psychology, 3*, 322–355. doi:10.1037/1076-8998.3.4.322
- Kivimäki, M., Vahtera, J., Elovainio, M., Virtanen, M., & Siegrist, J. (2007). Effort-reward imbalance, procedural injustice and relational injustice as psychosocial predictors of health: Complementary or redundant models? *Occupational and Environmental Medicine, 64*, 659–665.
- Liang, K.-Y., & Zeger, S. L. (1986). Longitudinal data analysis using generalized linear models. *Biometrika, 73*(1), 13–22. doi:10.1093/biomet/73.1.13
- Lopez, A. D., Mathers, C. D., Ezzati, M., Jamison, D. T., & Murray, C. J. L. (2006). Global and regional burden of disease and risk factors, 2001: Systematic analysis of population health data. *The Lancet, 367*, 1747–1757. doi:10.1016/S0140-6736(06)68770-9

- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*, 879–903. doi:10.1037/0021-9010.88.5.879
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385–401. doi:10.1177/014662167700100306
- Rueda, S., Chambers, L., Wilson, M., Mustard, C., Rourke, S. B., Bayoumi, A., ... Lavis, J. (2012). Association of returning to work with better health in working-aged adults: A systematic review. *American Journal of Public Health, 102*, 541–556. doi:10.2105/AJPH.2011.300401
- Rueda, S., Raboud, J., Mustard, C., Bayoumi, A., Lavis, J. N., & Rourke, S. B. (2011). Employment status is associated with both physical and mental health quality of life in people living with HIV. *AIDS Care, 23*, 435–443. doi:10.1080/09540121.2010.507952
- Rueda, S., Raboud, J., Plankey, M., Ostrow, D., Mustard, C., Rourke, S. B., ... Silvestre, A. (2012). Labor force participation and health-related quality of life in HIV-positive men who have sex with men: The multicenter AIDS cohort study. *AIDS and Behavior, 16*, 2350–2360. doi:10.1007/s10461-012-0257-3
- Rueda, S., Raboud, J., Rourke, S., Bekele, T., Bayoumi, A., Lavis, J., ... Mustard, C. (2012). The influence of employment and job security on physical and mental health in adults living with HIV: A cross-sectional analysis. *Open Medicine, 6*(4), 118–126.
- Smith, P. M., & Bielecky, A. (2012). The impact of changes in job strain and its components on the risk of depression. *American Journal of Public Health, 102*, 352–358. doi:10.2105/AJPH.2011.300376
- Stansfeld, S., & Candy, B. (2006). Psychosocial work environment and mental health—A meta-analytic review. *Scandinavian Journal of Work, Environment & Health, 32*, 443–462. doi:10.5271/sjweh.1050
- Taylor, S. E., Klein, L. C., Lewis, B. P., Gruenewald, T. L., Gurung, R. A. R., & Updegraff, J. A. (2000). Biobehavioral responses to stress in females: Tend-and-befriend, not fight-or-flight. *Psychological Review, 107*, 411–429. doi:10.1037/0033-295X.107.3.411
- Thielen, K., Nygaard, E., Rugulies, R., & Diderichsen, F. (2011). Job stress and the use of antidepressant medicine: A 3.5-year follow-up study among Danish employees. *Occupational and Environmental Medicine, 68*, 205–210. doi:10.1136/oem.2010.057943
- Twisk, J. (2003). *Applied longitudinal data analysis for epidemiology: A practical guide*. Cambridge: Cambridge University Press.
- Worthington, C., & Krentz, H. B. (2005). Socio-economic factors and health-related quality of life in adults living with HIV. *International Journal of STD & AIDS, 16*, 608–614. doi:10.1258/0956462054944408

## Appendix 1. Job Content Questionnaire

### Skills discretion

- (1) My job requires that I learn new things.
- (2) My job involves a lot of repetitive work.
- (3) My job requires me to be creative.
- (4) My job requires a high level of skill.
- (5) I get to do a variety of different things on my job.
- (6) I have an opportunity to develop my own special abilities.

### Decision authority

- (1) My job allows me to make a lot of decisions on my own.
- (2) On my job, I have very little freedom to decide how I do my work.
- (3) I have a lot to say about what happens on my job.

### Macro-level decision authority

- (1) How many people are in your work group or unit?
- (2) I have a significant influence over decisions in my work group or unit.
- (3) My work group or unit makes decisions democratically.
- (4) I have at least some chance that my ideas will be considered about company policy (e.g., hiring,

firing, wage levels, plant closings, new machinery purchases, etc.).

- (5) I supervise other people as part of my job.
- (6) I am a member of a union or employee association.
- (7) My union or employee association is influential in affecting company policy.
- (8) I have influence over the policies of the union or employee association.

### Psychological demands

- (1) My job requires working very hard.
- (2) I am not asked to do an excessive amount of work.
- (3) I have enough time to get the job done.
- (4) I am free from conflicting demands that others make.
- (5) My job requires long periods of intense concentration on the task.
- (6) My tasks are often interrupted before they can be completed, requiring attention at a later time.
- (7) My job is very hectic.
- (8) Waiting on work from other people or departments often slows me down on my job.

### Physical demands

- (1) My job requires a lot of physical effort.
- (2) I am often required to move or lift very heavy loads on my job.

- (3) My work requires rapid and continuous physical activity.
- (4) I am often required to work for long periods with my body in physically awkward positions.
- (5) I am required to work for long periods with my head or arms in physically awkward positions.

**Coworker support**

- (1) People I work with are competent in doing their jobs.
- (2) People I work with take a personal interest in me.
- (3) I am exposed to hostility or conflict from the people I work with.
- (4) People I work with are friendly.
- (5) The people I work with encourage each other to work together.
- (6) People I work with are helpful in getting the job done.

**Supervisory support**

- (1) My supervisor is concerned about the welfare of those under him/her.

- (2) My supervisor pays attention to what I am saying.
- (3) I am exposed to hostility or conflict from my supervisor.
- (4) My supervisor is helpful in getting the job done.
- (5) My supervisor is successful in getting people to work together.

**Job insecurity**

- (1) How steady is your work?
- (2) I feel secure in my current job.
- (3) During the past year, how often were you in a situation where you faced job loss or layoff?
- (4) Sometimes people permanently lose jobs they want to keep. How likely is it that during the next couple of years you will lose your present job with your employer?
- (5) My prospects for career development and promotions are good.
- (6) In five years, my skills will still be valuable.