# Job security offers mental health quality of life benefits over and above labour force participation in HIV

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**Authors Contribution**
Sergio Rueda conceived the project, oversaw the analysis, acted as the principal writer and is the guarantor for the manuscript. Janet Raboud and Cam Mustard made substantial contributions to the conception and design of the analysis and the interpretation of the results. Sean B. Rourke provided the data, contributed to the interpretation of the results, and revised the manuscript. Tsegaye Bekele conducted the data analyses, contributed to the interpretation of the results and revised the manuscript. Ahmed Bayoumi, John Lavis and John Cairney contributed with the design of the study and provided critical revisions to the manuscript for important intellectual content. All of the authors approved the final version of the manuscript.

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## INTRODUCTION

The detrimental effects of job loss on health have been well documented in the general population. Several longitudinal studies have shown a relationship between unemployment and mortality. The body of evidence linking unemployment with declines in health is sufficiently robust to suggest a portion of the association is causal.

Participation in employment provides workers with an income, structured time and regular activity, regular contact with people outside the immediate family, connection with goals that transcend their own, and identity and position within society. The perceived threat of unemployment implies the loss of important financial resources and the potential frustration of these needs.[9] Some studies suggest that job insecurity (the perception that one may lose one's job and negative work-related conditions) may be as detrimental to health as job loss itself. In this sense, job insecurity, which refers to a *subjective experience* that includes a *threat of involuntary job loss* and involves a degree of *uncertainty about the future,* represents a classic work stressor and can result in various strains according to stress process theory.

A meta-analysis of mainly cross-sectional studies in the general population found that job insecurity is associated with poorer health, particularly mental health.[16] Studies published after this meta-analysis was conducted have reported significant associations between job insecurity and a variety of health outcomes, including self-rated health, minor psychiatric disorders and/or depressive symptoms,[17-19] increased sickness leave, health service use and general practitioner visits, high cholesterol levels and high blood pressure, high secretion of cortisol,[23] and coronary heart disease.[24]

Reports of gender differences in the association between job insecurity and health have been inconsistent in the literature. Several studies have reported similar effects of job insecurity for men and women in the general population. However, one study found that gender moderated

the association between job insecurity and well-being, suggesting that job insecurity did not affect psychological well-being in women.[9] One longitudinal study found that job insecurity predicted severe depressive symptoms in men but not in women,[27] and another study found that job insecurity was associated with poor health for both men and women, but that the effect was stronger for men.[28]

Although there is substantial evidence linking job insecurity and health in the general population and other health conditions, there is a lack of evidence for people living with HIV. Given the unique nature and episodic course of HIV disease, we should not assume that these findings can be generalized to this study population. This is particularly salient given the high prevalence of unemployment in this population, ranging from 45% to 62%..

The study of the relationship between work and health has traditionally focused on the negative effects of job loss or unemployment instead of the positive effects of employment and return to work. We have recently shown in a systematic review of longitudinal studies that return to work has beneficial effects on health in a variety of populations, times and settings.[31] In the context of HIV, we have also shown in a cross-sectional study that employment was associated with better physical and mental health quality of life.[32]

The specific objectives of this study are: to evaluate the relationship between employment status and health-related quality of life in men and women living with HIV; to determine whether job security offers additional quality of life benefits over and above those provided by participation in employment alone in the context of HIV; and to examine the contribution of other demographic variables, socioeconomic factors, HIV-disease markers, and substance use indicators on health-related quality of life.

## 1METHODS

**1Study population and design**

This cross-sectional study presents baseline enrolment data from men and women living with HIV who participate in the Ontario HIV Treatment Network Cohort Study (OCS). The OCS is an ongoing longitudinal observational cohort study that collects data on the clinical profile and social determinants of health of people living with HIV at ten clinical sites across the province of Ontario, Canada. OCS staff routinely invites HIV-positive patients who are under care at these clinics to participate in the study.

The OCS collects clinical data through electronic medical records, chart extraction, and linkages to other databases. It also collects sociobehavioural data once per year through interviewer-administered questionnaires. All OCS participants are screened for eligibility and informed consent is obtained prior to clinical data extraction and questionnaire administration. Eligible participants include adults (>18 years old) with evidence of HIV infection (positive HIV antibody test or laboratory evidence of HIV infection), residents of Ontario and able to provide informed consent. Enrolled patients are provided with an honorarium for participation. This study was approved by the Research Ethics Board of the University of Toronto.

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**3Measures**

We used a structured interview format to collect data on age, gender, sexual orientation, marital status, ethnicity, country of birth, education, personal income, time since HIV diagnosis, non-medicinal drug use, employment status and job security. Data on CD4 cell count was collected through electronic medical records and chart abstractions while viral load information was supplemented from the Ontario Public Health Laboratories.

We administered the SF-36 Health Survey to those participants who completed an extended version of questionnaire and the SF-12 Health Survey to those who completed the core

questionnaire. Since the twelve items of the SF-12 are also included in the SF-36 -- and form the same eight domains of health as in the SF-36 -- we computed both the Physical Component Summary (PCS) and the Mental Component Summary (MCS) scores using the developers' instructions for the SF-12.[35] We transformed both summary scores (PCS and MCS) to have a mean of 50 and a standard deviation of 10. This means that scores below (or above) 50 indicate worse (or better) health-related quality of life compared to the reference population (i.e., the 1998 General US population).[35] The developers of the SF-36 suggest that a minimally important difference (MID) of 2-3 points seems reasonable for PCS as this difference in quality of life scores is usually associated with a 15% increased risk of being hospitalized in the subsequent year and is comparable to the disease burden of serious illnesses like heart disease, lung disease, diabetes, arthritis, and cancer.[36] The MID of 3 points seems reasonable for MCS as it is associated with a 30% increased risk of using mental health services and a 30% increased risk of depression.[36] Even though the MID has not been established for the SF-12, findings from comparative studies have shown strong correlations and a high degree of correspondence between SF-36 and SF-12 summary scores and suggest that the SF-12 performs as well as the SF-36 in terms of defining clinically important differences.[37-39] Thus, Ware Jr. and colleagues suggest that the SF-12 is comparable to the SF-36 in group-level studies and population surveys.[40]

We used the Alcohol Use Disorders Identification Test (AUDIT) to assess alcohol use. This instrument was developed by the World Health Organization to identify people whose alcohol consumption is harmful to their health.[41-43] Studies have shown that the AUDIT has adequate test-retest reliability, content, criterion, and construct validity[41] and has been used in HIV populations. We administered the entire questionnaire (10 items) to those participants who completed the extended questionnaire and only 3 of these items to those participants who

completed the core version. These three common items ask about frequency and amount of drinking and were used in this study to assess hazardous consumption of alcohol.

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**5Statistical analysis**

The selection of covariates was based on previous research and clinical experience. We dichotomized *sexual orientation* into heterosexual vs. gay, lesbian and bisexual, *marital status* into married, living common-law with a partner or living in a committed relationship vs. single, separated, divorced or widowed, *ethnicity* into Caucasian vs. non-Caucasian, *country of birth* between Canadian born vs. other, *education* into high school diploma or above vs. below high school, *personal income* into ≥ CAN$30,000/year vs. < CAN$30,000/year based on the median value. We categorized recent *viral load* data into detectable (≥ 50 copies/ml) and undetectable (< 50 copies/ml) and recent *CD4 counts* into ≥ 500 cells/$mm^3$ and < 500 cells/$mm^3$. *Non-medicinal use* included a single item asking participants to report whether or not they used drugs for non-medicinal purposes in the past 6 months. We used the Canadian Community Health Survey (CCHS) definition of *heavy alcohol use* if participants reported drinking alcohol in the past 12 months, had five or more drinks on a typical day, and did this more than once a month.

We dichotomized *employment status* into employed (i.e., working for pay) vs. non-employed (i.e., unemployed, volunteering, student, retired or on disability) and *job security* into secure if participants endorsed "secure or very secure" and insecure if they endorsed “very insecure, insecure or neutral” on the job security item (“How secure do you feel in your current job?”). We then created a 3-level *employment/job security* variable that combined these two dichotomous variables into securely employed, insecurely employed, and non-employed.

We examined the nature of the relationships between all the predictor variables and the outcomes using scatter plots and boxplots to make sure that all these univariate relationships

were reasonably linear. We performed univariate regression analyses between the SF-12 PCS and MCS scores and each of the predictor variables to determine which variables were most strongly associated with the outcome. We selected for inclusion in the regression models the covariates that showed the strongest relationship with the particular outcome of interest (p-values <0.10). We included the employment/job security variable into all multivariate regression models. We fitted two separate models using the same procedure and including the PCS and the MCS scores as outcomes (Physical Health Quality of Life and Mental Health Quality of Life, respectively). After the initial model was fitted, we removed the least significant variable and fitted a second model. We repeated this process until the most parsimonious model was found (i.e., all variables had p-values <0.05). In order to confirm that all relevant covariates were included in the regression models presented in this paper, we also fitted similar models using a hierarchical regression approach and using the Akaike Information Criteria (AIC) for variable selection. All three methods produced similar results, so we decided to present the most parsimonious models following the procedure described above. All reported p-values are two-tailed. All analyses were performed using SPSS 16.0 (SPSS Inc., Chicago, IL).

To determine whether excluded individuals were significantly different from those included in the analysis, we compared the sample characteristics between the two groups using t-tests and Wilcoxon rank-sum tests for continuous variables, and Pearson's $\chi^2$ tests for categorical variables.

## 2RESULTS

### 1Participants

We collected baseline data from 2,127 OCS participants between October 2007 and July 2009. For this analysis, we excluded 173 participants with missing data on key variables of

interest, including the outcome measures. We excluded 15 two-spirited or inter-sexed participants because we stratified the analyses by gender and they did not identify themselves as men or women, and we also excluded 9 transgender participants because they are usually recognized as a separate group and their employment and health realities are sufficiently different to warrant distinct attention.

The participants who were included in this study (N=1,930) were similar to those who were excluded (N=197) on most demographic, socioeconomic and clinical variables. However, a higher proportion of included participants were male (86% vs. 79%, p=0.006), gay, lesbian or bisexual (71% vs. 61%, p=0.003), white (74% vs. 64%; p=0.004), born in Canada (71% vs. 64%. P=0.035), married or living in a common-law relationship (39% vs. 31%, p=0.019), employed (47% vs. 34%, p=0.001), and had an annual income of ≥ CAN$30,000 (45% vs. 30%, p=0.001). They also were more likely to have undetectable viral load (75% v. 65%, p=0.002) and longer duration since HIV diagnosis (11.4 vs. 9.6 years, p=0.001).

Men and women were significantly different on several key variables, including both the main predictors (employment status and job security) and one of the outcomes (mental health-related quality of life). Thus, we decided to stratify by gender instead of adjusting for its effects. Table 1 shows that men were significantly more likely to be older, gay or bisexual, white, Canadian-born, and employed. Men were also more likely to have a higher level of education, higher income, and report having a secure job. In addition, men were more likely to have lived for a longer period of time since their HIV diagnosis, and report non-medicinal drug use, heavy alcohol use, and better mental health-quality of life.

**2Associations between sample characteristics and health-related quality of life for men**

In men, univariate analyses showed that being employed (regardless of job security level) was significantly related with higher physical health quality of life, while being securely employed was positively associated with mental health quality of life (Table 2). Other variables significantly associated with higher physical health-related quality of life included being gay or bisexual, higher level of education, higher income, higher CD4 cell counts and non-medicinal drug use. Younger age, less time since HIV diagnosis, white ethnicity, and being Canadian-born were associated with lower physical health quality of life. Mental health quality of life was positively associated with age, being married or living in a common law relationship, higher income, undetectable viral load, and longer time since HIV diagnosis, while non-medicinal drug use was associated with lower mental health quality of life.

Multivariable analyses indicated that being employed (regardless of job security level) was associated with physical health quality of life in men after controlling for being gay or bisexual, non-white, having a higher level of education, more income, higher CD4 counts, and having been diagnosed with HIV for a shorter period of time (Table 2). After adjusting for potential confounders, secure employment was associated with an increase of 6.67 points (95%CI 5.41 to 7.93) in physical health and insecure employment was associated with an increase of 5.33 points (95%CI 3.74 to 6.92) in physical health relative to non-employment. Thus, job security was associated with a slightly higher but statistically non-significant increase in physical health quality of life ($\beta$=1.34, 95%CI -0.22 to 2.89). With a suggested minimally important difference of 2-3 points for the physical health quality of life scores, the associations for both secure and insecure employment are both statistically and clinically significant.

Multivariable analyses also found that job security was associated with mental health-quality of life in men, suggesting that employment may offer a mental health benefit only if the

job is perceived to be secure (Table 2). Employed men with secure jobs reported significantly higher mental health quality of life than those who were non-employed (β=5.27, 95%CI 4.07 to 6.48), but insecure employment was not associated with a significant increase in mental health relative to non-employment (β=0.18, 95%CI -1.53 to 1.90). Thus, after adjusting for potential confounders, job security was associated with an average increase of 5.09 points in mental health (95%CI 3.32 to 6.89). With a suggested minimally important difference of 3 points for the mental health quality of life scores, this association is statistically and clinically significant. Being older, heterosexual, married or living in a common-law relationship and not using non-medicinal drugs were also associated with higher mental health scores.

*3*

**4Associations between sample characteristics and health-related quality of life for women**

In women, univariate analyses showed that employment was significantly associated with better physical health and mental health-quality of life, while job security was not significantly associated with either physical or mental health-related quality of life (Table 3). Other variables significantly related with better physical health-related quality of life included being married or living in a common law relationship, higher level of education and higher income. Older age, being Canadian-born, and non-medicinal drug use were inversely associated with physical health-quality of life. Lower mental health-quality of life was reported among women who identified as lesbian or bisexual and those who reported drug use while those with higher levels of education reported higher mental health scores.

In women, multivariable analyses showed that being employed (regardless of job security level) was significantly associated with both physical and mental health-quality of life (Table 3). After adjusting for potential confounders, secure employment was associated with an average increase of 4.83 points (95%CI 2.23 to 7.43) and insecure employment was associated with an

increase of 4.71 points (95%CI 0.74 to 8.68) in physical health compared to non-employment. Thus, the additional physical health benefit attributed to job security was minimal and non-significant (β=0.12, 95%CI -4.03 to 4.28). Younger age, being married, having higher levels of education, and not using recreational drugs were also associated with better physical health. For mental health, having a secure job was associated with an average increase of 6.02 points (95%CI 2.83 to 9.22) compared to non-employment after adjusting for potential confounders. Women who were insecurely employed reported higher but non-statistically significant mental health quality of life (β=4.88, 95%CI -0.08 to 9.84) relatively to non-employment. Thus, the additional mental health benefit associated with job security remained non-significant (β=1.14, 95%CI -4.14 to 6.42). Being lesbian or bisexual and non-medicinal drug use were also independently associated with lower mental health-quality of life. With a suggested minimally important difference of 2-3 points for the physical and mental health quality of life scores, the association between secure employment and mental health quality of life is both statistically and clinically significant while the association between insecure employment and mental health is not statistically significant but may be of clinical importance.

**3DISCUSSION**

This study found that for men living with HIV, having a job is associated with better mental health only if it is perceived to be secure, suggesting that the level of job security makes a difference in mental health. However, job security did not provide additional physical health benefits over and above those provided by employment alone, suggesting that with work comes health regardless of the level of job security. For women living with HIV, on the other hand, while employment was associated with both better physical and mental health, job security did not provide additional health benefits, suggesting that having a job is more important than the

level of security that job is perceived to offer. In addition, this study found that the additional effect sizes associated with job security for both men and women were higher for mental health than for physical health quality of life.

Our finding of a stronger relationship between job security and health among men with HIV is consistent with some studies conducted in non-HIV populations, but not all. This finding can be explained in part by role theory, which suggests that having a secure job is at the core of men's traditional role of being the primary bread winner and hence losing a job or having an insecure job is more distressing for them.[9] This could be true of both gay and straight men as both groups would typically have no expectation of financial dependence on partners or spouses (e.g., most gay couples would likely expect to live on two incomes). On the other hand, it is also plausible that the women in this study represent a more vulnerable group who faces more fundamental challenges derived from the combination of other hardships. Women in this study are more likely to be foreign-born, non-white, and unemployed. They also have less education, generate less income and are more likely to work in insecure jobs. It might be that the cumulative impact of these factors places more pressure on the importance of having a job, any job, regardless of the level of security the job can offer. As women are more likely than men to be over-represented in precarious employment, they would generally have lower expectations related to job security and stability. This suggests that gender differences may also be explained in part by the differences in the structure of occupations and the characteristics of jobs available to men and women.

The finding of a stronger association between job security and mental health is consistent with studies conducted in the general population. A meta-analysis reported that the average size of the associations between job insecurity and mental health was greater in magnitude than the average size for physical health.[16] A defining feature of job insecurity is the sustained exposure to

a threat of losing one's job, which requires dealing with the resulting uncertainty about the future, including the unpredictability and uncontrollability associated with a potential loss of material and psychosocial resources. It could be argued that experiencing uncertainty for an extended period of time (the classical emotional exhaustion or burnout) is in some ways worse in its anticipation than actual job loss, which at least allows the person to face the outcome and take steps to regain control and cope with the loss. It is possible that this detrimental effect on mental health may contribute, in turn, to a decline in physical health as a subsequent or more distal outcome. Job insecurity may affect physiological measures through several stress-related processes that result in elevated blood pressure and acceleration of atherosclerotic plaque and dysregulation of the autonomic nervous system and the hypothalamus-pituitary-adrenal axis.[24] A higher prevalence of adverse physiological measures and coronary heart disease has been reported among people facing job insecurity. The stress associated with job insecurity may also have an indirect influence on physical health through alterations in health behaviours such as smoking, diet, and physical inactivity.[46-48]

In examining the contribution of other demographic variables on health-related quality of life, we found that gay, lesbian and bisexual men and women reported significantly poorer mental health than those who identified as heterosexual. This is consistent with findings from other studies that have reported greater health complaints,[49] elevated levels of psychological distress, higher prevalence of mood disorders,[52-54] substance use disorders,[55] and suicide attempts[56-58] among gay and bisexual people.

On the other hand, our data showed that a higher level of education was associated with better physical health among both men and women. Previous studies have reported better perceived health status and physical health in highly educated people with HIV than in individuals with a low level of education. This association may be due in part to increased access

to knowledge and resources that can facilitate self-care practices and the ability to negotiate the health care system. Our finding of an association between income and physical health is also consistent with previous studies. Other studies have reported elevated risk of death among those with low socioeconomic status, no accumulated financial assets, and low level of education, and among the unemployed.[63-67]

The strengths of this study include the examination of a broad set of sociodemographic data on a relatively heterogeneous sample of people with HIV with comprehensive adjustment for a range of potential confounders. However, a major limitation of this study was its cross-sectional design. The nature of the data did not allow us to establish the direction of the association between job security and health. The conceptual framework that situates job insecurity as a stressor that contributes to illness assumes that job insecurity precedes poor health, but it is also plausible that people suffering from poor health are more likely to experience job insecurity and be affected more by it. Future research using longitudinal data would provide an opportunity to examine the relative contribution of these reinforcing mechanisms.

Gender differences should also be interpreted with caution as men and women in our study had different demographic characteristics with a sample divided largely between white gay men and black heterosexual women. This sample divide makes it very difficult to disentangle the relative contribution of gender, ethnicity, sexual orientation, immigration status and other factors as they are inseparable facets of people's everyday lives. Also, the difference in sample size between men and women participants may also have contributed to the gender disparities. For example, univariate analysis revealed a significant association between CD4 cell counts and physical health quality of life among men, but failed to detect statistical significance among women even though the magnitude of the association was larger among women. Therefore, it is

also possible that the small sample size of women participants may have increased the probability of Type II error (i.e., the error of failing to detect a difference when there is one), particularly in multivariate analysis.

Another potential limitation of this study is the use of a single-item measure of job security. It has been argued that the definition of job insecurity as the threat of job loss exclusively is too narrow[12] as there are other important factors that should be taken into account, such as threats to career opportunities, valued job features, employment conditions (e.g., demotions), relations with co-workers, and the powerlessness to deal with these threats. Despite the narrow focus of a single-item measure, studies that have used multi-item scale measures of job insecurity have revealed stronger associations between job insecurity and various outcomes relative to studies using single-item measures.[16] This suggests that the use of a single-item measure of job security in our study may have neglected important components of the experience of working in insecure jobs, but it is also plausible that our findings may have underestimated the health effects of job insecurity.

To our knowledge, this is the first study that has examined the association between job security and health in people with HIV. This study was able to focus on the issue of *availability* of work (employment status) and only one of many aspects related to the *nature* or *quality* of work (job security). Insecure jobs are more likely to have limited benefits, even in countries with universal health care, where access to drug coverage, dental and other health services, and disability insurance is mostly sponsored by employers. AIDS Service Organizations in general offer very limited return-to-work programs or retention supports for those who are currently working and may be struggling to keep their jobs. There is a need to advance employment policies to promote job security in people living with HIV. These policies may not only offer income stability but also physical and mental health benefits to people with HIV.