A Brief Tool to Screen Patients for Precarious Employment: A Validation Study

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ABSTRACT

PURPOSE Precarious employment, defined by temporary contracts, unstable employment, or job insecurity, is increasingly common and is associated with inconsistent access to benefits, lower income, and greater exposure to physical and psycholosocial hazards. Clinicians can benefit from a simple approach to screen for precarious employment to improve their understanding of a patient's social context, help with diagnoses, and inform treatment plans and intersectional interventions. Our objective was to validate a screening tool for precarious employment.

METHODS We used a 3-item screening tool that covered key aspects of precarious employment: non-standard employment, variable income, and violations of occupational health and safety rights and protections. Answers were compared with classification using the Poverty and Employment Precarity in Southern Ontario Employment Index. Participants were aged 18 years and older, fluent in English, and employed. They were recruited in 7 primary care clinic waiting rooms in Toronto, Canada over 12 months.

RESULTS A total of 204 people aged 18-72 years (mean 38 [SD 11.3]) participated, of which 93 (45.6%) identified as men and 119 (58.3%) self-reported as White. Participants who reported 2 or more of the 3 items as positive were almost 4 times more likely to be precariously employed (positive likelihood ratio = 3.84 [95% CI, 2.15-6.80]).

CONCLUSIONS A 3-item screening tool can help identify precarious employment. Our tool is useful for starting a conversation about employment precarity and work conditions in clinical settings. Implementation of this screening tool in health settings could enable better targeting of resources for managing care and connecting patients to legal and employment support services.

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INTRODUCTION

Employment is a key social determinant of health, impacting income, access to basic necessities, and social status.[1] Employment typically determines a person's income, ability to afford necessities, and access to health insurance. It is also central to our social connectedness.[2] Precarious employment desscribes a set of conditions characterized by employment insecurity, low wages and benefits, and a lack of protections and rights at work.[3-5] People who are precariously employed have worse health (likely due to having lower incomes), a lower sense of security, more stress within the workplace, and lack of access to benefits (including paid sick days and health insurance).[6,7] In addition, people with chronic health issues are more likely to experience precarious employment and are more likely to have difficulty reentering the workforce when they become unemployed.[8] Precarious employment, a growing phenomenon since the 1980s, is related to the decline in unionization and changes to traditional post–World War II employer-employee relationships as many countries turned to neoliberal macroeconomic policies that undermined the gains made by workers in Europe and North America after World War II.[9-11]

Integrating health and social care by addressing social determinants of health is becoming a focus for many health systems.[12,13] Brief clinical tools are needed to screen individuals for social risks, serving as a first step toward interventions to support patients experiencing precarious employment.[14] No brief screening tools yet exist to easily identify precarious employment within the primary care setting. Despite the lack of screening tools, there have been interventions to address

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precarious employment in primary care, including the Health Leads model that involved volunteers connecting patients to community resources, such as opportunities for work.[15] A recent systematic review identified intersectoral interventions in health care settings that can be effective in helping unemployed patients gain employment.[8]

Screening for precarious employment is particularly important in primary care settings where health care providers build trusting relationships with their patients, patients can be followed over time, and coordination of clinical care and community services can occur.[13,16,17] Also, primary care is often the first point of contact for patients experiencing health concerns related to precarious employment, occupational injuries, and unemployment.[18] Given a lack of existing tools, the objective of this study was to validate a brief tool to screen patients for precarious employment in the primary care setting.

METHODS

This study was approved by the Unity Health Toronto Research Ethics Board (#18-164). Reporting follows the Standards for Reporting of Diagnostic Accuracy guideline.[19]

Participants were recruited via convenience sampling in 7 primary care clinic waiting rooms in Toronto, Canada from July 2018 through June 2019. These clinics serve patients living in the southeast downtown area, a densely populated area with higher rates of poverty than the rest of the city. Participants were aged 18 years and older, fluent in English, attending 1 of the clinics, currently employed, and not a patient of members of the study team.

Three screening questions using simple language were developed by the study team, based on existing short screening tools for other social needs,[20-22] to address the key aspects of precarious employment: (1) non-standard employment (Are you currently employed in a casual, short-term or temporary position?); (2) violations of occupational health and safety rights and protections (Do you feel fearful that you could be fired if you raised employment concerns?); and (3) income variability (Does your pay vary a lot from month to month?).[3] The surveys were administered using electronic tablets. The survey was first piloted with a small convenience sample to ensure it had content and face validity before proceeding to data collection.

The 3-item questionnaire was administered along with the Poverty and Employment Precarity in Southern Ontario (PEPSO) Employment Precarity Index.[23,24] The PEPSO Employment Precarity Index was developed using 2 major surveys of workers in the greater Toronto area and in Hamilton, Ontario, Canada.[23] It consists of 12 questions addressing 10 components of precarious employment, including employment relationship, income uncertainty, scheduling uncertainty, and relationship uncertainty. The index is calculated by summing the values of the 10 components for a score of 0 to 100, and categorizes workers along a gradient (secure, stable, vulnerable, and precarious). The cutoff point for precarious employment is a score of 38 or greater, which was determined based on detailed responses from 4,058 workers.

Table 1. Participant Demographics (N = 204)

Characteristic	No. (%)
Age category, y	
18-39	123 (60.6)
40-59	66 (32.5)
60-64	8 (3.9)
≥65	6 (3.00)
Missing	1 (0.00)
Gender identity	
Male	93 (45.6)
Female	106 (52.0)
Other	5 (2.5)
Missing	0 (0.0)
Racial background	
White	119 (58.3)
Non-White	85 (41.7)
Born in Canada	
Yes	135 (66.2)
No	69 (33.8)
Immigrant-years arrived in Canada	
0-5	6 (8.2)
6-10	14 (20.6)
> 10	48 (70.7)
Missing	1 (0.0)
Educational attainment	
Attended high school, not completed	3 (1.5)
Completed high school	17 (8.5)
Attended business, trade, technical school, not completed	4 (2.0)
Completed business, trade, technical school	28 (13.9)
Attended university, not completed	12 (6.0)
Completed university (Bachelor's degree)	71 (35.3)
Attended graduate school, not completed	11 (5.5)
Completed graduate school	55 (27.4)
Missing	3 (0.0)

To calculate our sample size, we considered precarious employment as the primary outcome. Without loss of generality, we assumed that the screening questions have binary answers (yes or no) or could be dichotomized. Because recent studies reported that the prevalence of precarious employment ranges from 9% to 48% with a median of 17.5%,[23,25-27] we used this median prevalence as an approximation for the hypothesized prevalence of precarious employment. We also hypothesized values of sensitivity and specificity between 70% and 80% using a pre-specified CI width of 15%, ie, CI precision of 7.5%. We applied the sample size formula for deriving the sensitivity and specificity CIs when the outcome of the patients (ie, precarious employment) is not known at

Table 2. Association Between the Number of Endorsed Screening Questions and the PEPSO Employment Precarity Index Categories (N = 200)

PEPSO Category	No. of Endorsed Screening Items, No. (%)			
	0 (n = 86)	1 (n = 73)	2 (n = 29)	3 (n = 12)
Secure	37 (18.5)	9 (4.5)	0 (0.0)	0 (0.0)
Stable	20 (10.0)	14 (7.0)	3 (1.5)	2 (1.0)
Vulnerable	17 (8.5)	22 (11.0)	7 (3.5)	2 (1.0)
Precarious	12 (6.0)	28 (14.0)	19 (9.5)	8 (4.0)

PEPSO = Poverty and Employment Precarity in Southern Ontario.

the time of recruitment, as opposed to a case-control design.[28] The aim was to estimate 95% CIs for sensitivity and specificity of a set of questions to screen for occupational hazards and precarious employment. We calculated that we would require a minimum of 200 participants to calculate specificity, sensitivity, and make conclusions about the validity of the screening questions. To compare measures of diagnostic accuracy, we performed a prevalence test between the PEPSO scores and the 3-item questionnaire. There was no indeterminate index. Diagnostic accuracy was exploratory as we looked at whether participants answered positively to 1, 2, or 3 questions.

RESULTS

There were 204 participants in this study. We did not collect data on the number of people who declined to participate. Of the 204 participants, 4 people did not respond to either the 3-item screening tool or the PEPSO Employment Precarity Index, and were excluded from the analysis. Table 1 provides participant demographics.

The employment status of the participants, based on the PEPSO Employment Precarity Index, showed that 67 (33.5%) had precarious employment, 48 (24.0%) were vulnerable, 39 (19.5%) were stable, and 46 (23.0%) were secure. The number of endorsed screening questions is correlated with a higher PEPSO score (N = 200, rho = 0.55, P <.001). Table 2 provides the association between the total number of endorsed questions and the PEPSO categories.

Participants who would be categorized as precarious by the PEPSO Employment Precarity Index were also identified by 2 or 3 of screening questions with a positive likelihood ratio of 3.84 (95% CI, 2.15-6.80). Table 3 provides a summary of the prevalence values for sensitivity, specificity, likelihood ratios, odds ratio, positive predictive value and negative predictive value.

DISCUSSION

This validation study of a 3-item screening tool for precarious employment involved employed adults recruited in primary care waiting rooms. People who reported 2 or 3 items as positive were almost 4 times more likely to be precariously employed, according to the PEPSO index.

There were several limitations to this study. Our study occurred in Canada, and the brief screening tool may not be generalizable to all settings. However, it is likely that the 3 domains covered in the screening tool (non-standard employment, violations of health and safety, pay variability) are universal to precarious employment, independent of context. The PEPSO Employment Precarity Index survey was developed and used in Ontario, Canada and has not been validated in other populations. However, we consider it to be the best survey on employment status available at the time of this study in Canada. There were 12 participants who endorsed 0 screening questions that were identified as vulnerable or precarious by the PEPSO questionnaire. This is not unexpected for a brief screening tool, which balances ease of use with sensitivity. The recruitment of eligible participants was limited by the bounds of clinic hours and may be biased away

Table 3. Comparison of Participants Categorized as Experiencing Precarious Employment With Those in Vulnerable, Stable, or Secure Employment

Questions and No. of Items Endorsed	SEN (95% CI)	SPEC (95% CI)	PPV (95% CI)	NPV (95% CI)
Are you currently employed in a casual, short-term or temporary position?[1]	63.6 (50.9-75.1)	72.52 (64.0-80.0)	53.8 (42.2-65.2)	79.8 (71.5-86.6)
Do you feel fearful that you could be fired if you raised employment concerns?[1]	22.6 (12.9-35.0)	86.2 (79.0-91.6)	43.8 (26.4-62.3)	70.0 (62.3-77.0)
Does your pay vary a lot from month to month?[1]	50.7 (38.2-63.2)	82.6 (75.0-88.6)	59.6 (45.8-72.4)	76.8 (68.9-83.4)
Endorsed 1, 2, or 3 domains[2]	82.1 (70.8-90.4)	55.6 (46.8-64.2)	48.2 (38.8-57.8)	86.0 (76.9-92.6)
Endorsed 2 or 3 domains[2]	40.3 (28.5-53.0)	89.5 (83.0-94.1)	65.9 (49.4-79.9)	74.8 (67.4-81.4)

LR– = negative likelihood ration; LR+ = positive likelihood ratio; NPV = negative predictive value; OR = odds ratio; PPV = positive predictive value; PEPSO = Poverty and Employment Precarity in Southern Ontario; ROC = receiver operating characteristic; SEN = sensitivity; SPEC = specificity.

[1] Answered yes to this question in the PEPSO Employment Precarity Index.
[2] Participants categorized as experiencing precarious employment by the PEPSO index were identified by endorsing 2 or 3 of the screening questions.

from patients in precarious employment that may not be able to attend regular clinic hours.

Screening for precarious employment is particularly important in a primary care setting, but clinicians need to have support for knowing how to use the information they obtain in order to intervene when a patient screens positive for precarious employment. In clinics with social workers, health promoters, community health workers, or a medical-legal partnership, a positive screen could trigger an internal referral to support the patient in knowing their rights at work, what to do if they are facing health or safety challenges, and advice on seeking new employment. A positive screen may open up a conversation between a clinician and patient about employment and the impact on symptoms, particularly exposure to physical hazards and mental health concerns.[1] When identifying patients experiencing precarious employment, clinicians can refer patients to community resources that address worker rights, legal supports, and alternative employment.[29,30]

In a systematic review, we identified 88 studies of interventions based in health settings to address unemployment, and the majority were successful.[8] These interventions had similar characteristics including multidisciplinary teams, placing patients and their needs at the center, 1-on-1 tailored services, and engaged employers. Further research is needed on the impact of screening for precarious employment, the implementation of screening efforts, effective interventions for patients who are precariously employed, and on the psychometric testing of our 3-item tool.[31,32]

As DeVoe et al and others have stated,[16,33] it is important to move from simply collecting data on the social determinants of health to initiating actions that improve population health. Data on the extent of precarious employment could be pooled across clinics and medical centers in an area and used to inform policy discussions on worker rights, minimum wage laws, and the inspection of workplaces for violations of occupational health and safety codes.[34,35] Individual-level data on the social determinants of health, linked to health records, can provide the foundation for better health care services that would serve the needs of patients and reduce heath inequities through clinic-level interventions and changes in policy to reduce precarious employment in the broader society.[13,32]

Precarious employment is an important social determinant of health, yet may not be apparent without a detailed social history that is not easily obtained in busy primary care clinics. This study demonstrates that a brief screening tool for precarious employment can be used in health care settings. Patients who screen positive could be referred to legal and employment support services, and this information may assist with diagnoses and inform treatment plans. Beyond individual patients and clinics, this data can be used to support policy change to both reduce precarious employment and redesign health systems to intervene and address it.

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Key words: employment; health inequities; primary care; screening; social determinants of health

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ROC (95% CI)	LR+ (95% CI)	LR– (95% CI)	OR (95% CI
0.681 (0.611-0.751)	2.32 (1.66-3.23)	0.501 (0.358-0.702)	4.62 (2.46-8.66)
0.544 (0.483-0.604)	1.63 (0.869-3.06)	0.899 (0.773-1.05)	1.81 (0.845-3.90)
0.667 (0.598-0.735)	2.91 (1.88-4.52)	0.596 (0.462-0.770)	4.88 (2.52-9.39)
0.689 (0.626-0.751)	1.85 (1.48-2.31)	0.322 (0.189-0.549)	5.75 (2.84-11.6)
0.649 (0.584-0.714)	3.84 (2.15-6.80)	0.667 (0.543-0.819)	5.74 (2.76-11.9)

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