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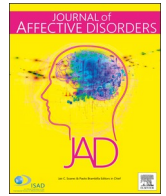
Research paper

Associations between cognitive and affective job insecurity and incident purchase of psychotropic drugs: A prospective cohort study of Swedish employees

Sandra Blomqvist[a],[*], Tianwei Xu[b], Paraskevi Persitera[a], Lena Låstad[c], Linda L. Magnusson Hanson[a]

[a] Stress Research Institute, Stockholm University, SE-106 91 Stockholm, Sweden
[b] Department of Public Health, Copenhagen University, Denmark
[c] Department of Psychology, Stockholm University, Sweden

A B S T R A C T

Background: Previous research suggests that job insecurity is associated with poor mental health, but research examining how different aspects of job insecurity relate to clinical measures of poor mental health are lacking. We aimed to investigate the association between cognitive and affective job insecurity and incident purchases of psychotropic drugs.
Methods: We included 14,586 employees participating in the Swedish Longitudinal Occupational Survey of Health (SLOSH), who answered questions on cognitive and/or affective job insecurity in 2010, 2012 or 2014. Respondents were followed in the Swedish Prescribed Drug Register (2.5 years on average). We investigated the association between job insecurity and incident psychotropic drugs with marginal structural Cox models.
Results: Affective job insecurity was associated with an increased risk of purchasing any psychotropic drugs (Hazard Ratio (HR) 1.40 (95% Confidence Interval (CI) 1.04–1.89)) while cognitive job insecurity was not (HR 1.15 (95% CI 0.92–1.43)). Cognitive and affective job insecurity were both associated with antidepressants, affective job insecurity with anxiolytics, but no association was found with sedatives. Women and younger workers seemed to have higher risk compared to men and older workers, but differences were not statistically significant.
Limitations: Although job insecurity and psychotropic drugs were assessed through independent sources and several covariates were considered, unmeasured confounding cannot be ruled out.
Conclusions: The findings support that affective job insecurity is a risk factor for psychotropic drug treatment, that it may be relevant to distinguish between different types of job insecurity, and to consider sex and age as moderating factors.

1. Introduction

Mental health problems account for a large share of the global burden of disease today (World Health Organization, 2017). In the European working-age population, the point prevalence of clinically defined mental disorders was estimated to 20% and the lifetime prevalence to as much as 50% (OECD, 2012). Also sleep problems are common today and often related to mental health problems (Johnson et al., 2006; Roth et al., 2011). The point prevalence of sleep problems has been estimated to 24% in the adult population (Soldatos et al., 2005).

In Sweden, the prevalence of mental health complaints has increased during the last 10 years (Swedish Public Health Agency, 2017). An increasing trend in sick leave due to psychiatric diagnoses has been observed since the 1990s (Swedish Social Insurance Agency, 2015; The Swedish Social Insurance Inspectorate, 2014) and prescriptions of psychotropic drugs, which are often used to treat mental and sleep disorders (Bushnell et al., 2006; Pillai et al., 2016), especially antidepressants, have increased the last decade (Swedish National Board of Health and Welfare, 2019). Similarly, sleep disturbances have increased in Sweden (Swedish Public Health Agency, 2017).

At the same time, the nature of work in many countries, including Sweden, has changed in many ways the last decades. Increased

globalization, new innovations and technological advancements have created new opportunities on the labor market but have also inferred a pressure on employers to be flexible in order to sustain their business (Lee et al., 2018). [1]An increased use of atypical employment forms is likely to increase feelings of uncertainty about future job situations among employees (Berglund, 2014). Job insecurity in terms of worrying about ones future employment, has been associated with e.g. poor health and low wellbeing (De Witte et al., 2016), suicidal ideation (Milner et al., 2017), burnout symptoms (Aronsson et al., 2017) and depressive symptoms (Kim and von dem Knesebeck, 2016; Theorell et al., 2015). However, evidence on the impact of job insecurity on mental health and sleep problems has repeatedly been reported as limited or insufficient (Aronsson et al., 2017; Bonde, 2008; Harvey et al., 2017; Linton et al., 2015; Netterstrom et al., 2008; Nieuwenhuijsen et al., 2010; Theorell et al., 2015). In previous research, job insecurity has been measured in a range of different ways, capturing subjective and/or objective components, which may represent different types of job insecurity (Ferrie, 2001; Sverke et al., 2006). More research distinguishing between different types of job insecurity has been requested (Cheng and Chan, 2008; Sverke et al., 2002). One such distinction is between cognitive job insecurity referring to the perceived likelihood of job loss and affective job insecurity, referring to the fear of job loss (Borg and Elizur, 1992), sometimes described as the emotional and the belief components of job insecurity (Jiang and Lavaysse, 2018). A recent meta-analysis found a stronger correlation between affective job insecurity and 16 (i.e. general health and psychological health) of the 27 outcomes, than for cognitive job insecurity (Jiang and Lavaysse, 2018). However, this meta-analysis was mainly based on cross-sectional data and did not include any study with clinically diagnosed mental health outcomes. The fact that previous studies examining job insecurity and diagnosed common mental health disorders are virtually non-existent is a major limitation in the literature (De Witte et al., 2016; Kim and von dem Knesebeck, 2016). The use of self-reported measures on both exposure and outcomes increases the risk of common method variance bias, limiting the possibility of making causal conclusions (Podsakoff et al., 2003). Furthermore, it is still unclear to what extent job insecurity is associated with more severe mental health problems associated with substantial disability.

In the present study we investigate the longitudinal association between both cognitive and affective job insecurity and incident purchases of psychotropic drugs, in order to increase the knowledge on different types of job insecurity and their relation to mental and sleep disorders, measured with independent sources.

2. Method

2.1. Study sample

The study population consists of respondents to the Swedish Longitudinal Occupational Survey of Health (SLOSH), an approximately representative cohort of the Swedish working population starting in 2006. The SLOSH cohort includes individuals originally recruited from the Swedish Work Environment Surveys (SWES) 2003–2011, comprising gainfully employed men and women, aged 16–64 years originally randomly drawn from the whole Swedish population after stratification by county, sex and citizenship (Hanson et al., 2018). Some cohort members were recruited from SWES 2003 (n = 9214) in 2006, while additional recruitments were made from the 2005 SWES in 2008 (n = 9703), from SWES 2007 in 2010 (n = 7728), and from SWES 2009 and 2011 in 2012 (n = 14232). All eligible participants were asked to provide self-report follow-up data

biennially henceforth. The total cohort thus far consequently consists of 40,877 individuals out of which 29,676 (73% of the total cohort) have responded to follow-up questionnaires. In general, women, older people, those who are married, born in Sweden and with an university degree have responded to SLOSH to larger extent than other sociodemographic groups (Hanson et al., 2018). The present study relies on information from the self-completion survey version addressed to those working on average at least 30% of full-time the past 3 months (as opposed to the version for those working less than 30% or not at all) in 2010, 2012 or in 2014 (n = 20,058). We treated the respondent's first wave of participation as baseline, and excluded those who purchased antidepressants, anxiolytics and sedatives before baseline. We excluded those who had sleep problems or suffered from major depression at baseline. We also excluded farmers and self-employed. This yielded a study sample of n = 14,586 participants, for details see Fig. 1. Subsamples by type of job insecurity and drug type was further created. The study was approved by the Regional Ethical Review Board in Stockholm (2006/158-31, 2012/373-3115, 2017/25-32).

2.2. Job insecurity

Two measures of job insecurity were derived from the SLOSH survey. Cognitive job insecurity (Borg and Elizur, 1992) was measured with the following questions: *Are you under threat of temporary or permanent dismissal? Are you under threat of workplace closure/downsizing?* The respondents were considered exposed to cognitive job insecurity if reporting *Yes* on at least one of the questions at baseline. If reporting *No*, the person was considered unexposed. Affective job insecurity (Borg and Elizur, 1992), was measured by asking the respondents whether they on a five-category scale, completely disagreed (1) or completely agreed (5) with being *worried that they will be dismissed; if they will get to keep their job* or *whether they will lose their job.* If a person reported a value of 4 or 5, on at least one the questions he/she was categorized as exposed, otherwise unexposed. Those with missing information on all three question were excluded from further analyses.

2.3. Purchases of psychotropic drugs

Information on purchases of psychotropic drugs, available from 1st of July 2005 to the 30th of November 2014, was retrieved from the Swedish Prescribed Drug Register, containing information on e.g. date of filled prescription and type of drug, linked to SLOSH via personal identity numbers. In accordance with Anatomical Therapeutic Chemical (ATC) classification system prescriptions for antidepressant (N06A), anxiolytics (N05B) and sedatives/hypnotics (N05C) were extracted from the register. If a respondent's first purchase was later than the date their questionnaire was received, they were considered to have made an incident purchase. Those who made a purchase before that date was excluded. So were those who at baseline reported symptoms of major depression, assessed via a subscale of the Hopkins Symptom Checklist (SCL-90), the SCL-CD6. Respondents were asked, on a scale from 0 (not at all) to 4 (very much) whether they had been bothered by feelings of low in energy; low interest in things; that everything is an effort; self-blame; felt worried or blue, during the last week. Those with a value ≥ 17 after adding the items on this 0–24 scale, were excluded from analyses (Hanson et al., 2014). Those who at baseline reported sleep disturbances, assessed via the Karolinska Sleep Questionnaire (Kecklund and Akerstedt, 1992; Nordin et al., 2013) were excluded as well. Sleep disturbances was defined as, during the last 3 months, having had either difficulties falling asleep, waking up, repeated awakenings during night or not feeling rested despite having slept at ≥ 3 times a week.

2.4. Confounders

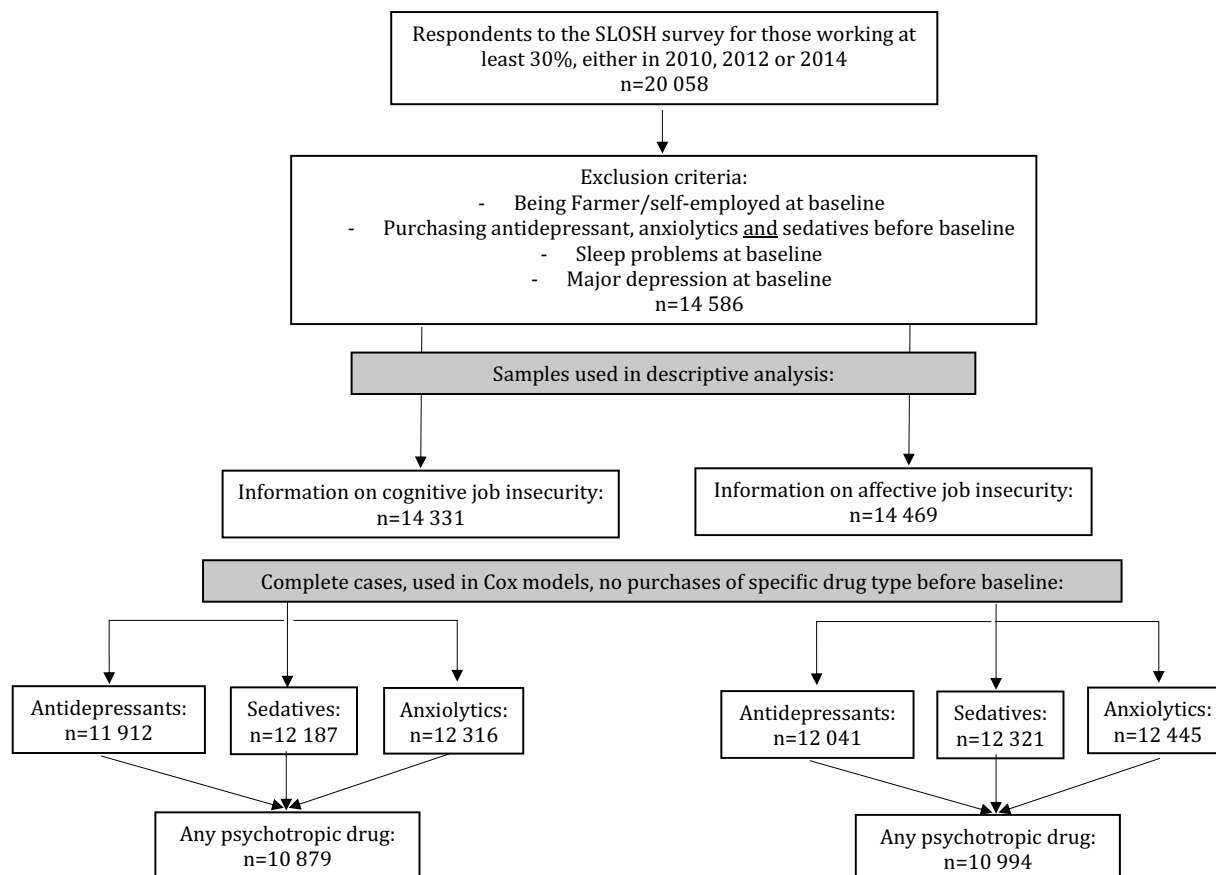The selection of confounders were based on the directed acyclic

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Fig. 1. Flow chart describing the inclusion/exclusion criteria of the analytical sample.

graph (DAG) approach (Greenland et al., 1999) and using knowledge from previous research (Shoss, 2017; Sverke et al., 2006). Factors identified as confounders included sex, age, socioeconomic position, contractual work hours, employment sector and social support. Socioeconomic position was measured via a person's income from work and the socioeconomic classification system of persons in the labor force constructed by Statistics Sweden from occupations. The following groups were used; (1) unskilled workers, (2) skilled workers, (3) lower non-manual, (4) intermediate non-manual, (5) higher non-manual workers and professionals and 6) self-employed. Contractual work hours was either (1) full-time contract or (2) part-time contract. Employment sector was categorized into (1) public or (2) private sector. Marital status, either being (1) single or (2) married/cohabiting, served as a proxy for social support. Furthermore, we took into account whether a person had children living at home (1) or not (2).

2.5. Statistical analysis

After descriptive analyses, we applied Marginal structural Cox models with inverse probability (IP) weights, a method within the counterfactual framework (Hernán et al., 2000), to investigate the association between job insecurity and incident purchase of psychotropic drugs. This approach provides population average (marginal effects) which compare a population where everyone is exposed to a population where everyone is unexposed (Hernán et al., 2000; Williamson and Ravani, 2017). Conditional effects derived in traditional cox models in contrast estimate effects of an exposure on an outcome conditioned on the included covariates in that model, and may differ across samples depending on which covariates are included (Mood, 2010). The marginal structural models, were fitted by first calculating stabilized IP weights for each individual by fitting a logistic regression model of the

probability of being exposed to cognitive and affective job insecurity, respectively, conditioned on the confounders identified in the DAG, measured at baseline. This is done to assign a weight to each observation based on a set of chosen covariates, in order to balance confounding between exposed and unexposed. A new re-weighted sample is then used when analyzing the relationship between exposure and outcome (Williamson and Ravani, 2017). In a second step, weighted Cox regression models were hence fitted, with months from baseline as the underlying timescale. Participants were followed to the date of first purchase of antidepressants, sedative or anxiolytic, death or end of follow up (last of November 2014). Lastly, robust confidence intervals were estimated by using bootstrapping, with a resampling of 500 times as ordinary 95% confidence intervals do not have a 95% coverage in marginal structural models (Mansournia et al., 2017). The proportional hazard assumption was tested by visually inspecting outcome and exposure specific Kaplan–Meier curves, log-log survival plots and by including an interaction term of time and covariates into the model. Purchases of any psychotropic drug as well as purchases of antidepressants, sedatives and anxiolytics, respectively were analyzed separately in relation to either cognitive job insecurity or affective job insecurity. Only complete cases were analyzed, see Fig. 1 for sample sizes.

Several additional analysis were conducted, assigning each observation a new weight Hernán and Robins, 2020. Because previous research has indicated that sex and age may act as moderators in the association between job insecurity and mental health problems (Cheng and Chan, 2008; Keim et al., 2014; Shoss, 2017), we performed stratified analyses on men and women as well as employees younger than 50 years and older- aged 50 and above. Furthermore, job insecurity may also be affected by labor market sector Anderson and Pontusson, 2007, hence stratified analyses were performed by private

Table 1
Sociodemographic factors at baseline among participants with information on cognitive job insecurity.

| | Cognitive job insecurity (n = 14,331) | | | |
| | Yes (n = 3030) | | No (n = 11,301) | |
	n (mean)	% (SD)	n (mean)	% (SD)
Sex				
Women	1406	46.4	6286	55.6
Men	1624	53.6	5015	44.4
Age	48.1	(10.2)	50.0	(10.4)
Civil status				
Single	637	21.3	2161	19.4
Married/cohabiting	2356	78.7	8987	80.6
Children at home				
No	1473	49.4	5835	47.5
Yes	1510	50.6	5285	52.5
Occupational status				
Unskilled manual worker	533	17.6	1656	14.6
Skilled manual worker	529	17.4	1905	16.9
Assistant non-manual	445	14.7	1551	13.7
Intermediate non-manual	875	28.9	3669	32.5
Professionals, executives, higher non-manual	648	21.4	2520	22.3
Yearly income from work (SEK)	3727.4	(2146.7)	3724.7	(1903.5)
Sector				
Private	2013	68.5	5645	51.9
Public	926	31.5	5227	48.1
Contractual work hours				
Fulltime	2466	85.8	8954	81.9
Part-time	407	14.2	1979	18.1

Table 2
Sociodemographic factors at baseline among participants with information on affective job insecurity.

| | Affective job insecurity (n = 14,469) | | | |
| | Yes (n = 901) | | No (n = 13,568) | |
	n (mean)	% (SD)	n (mean)	% (SD)
Sex				
Women	496	55.1	7286	53.7
Men	405	44.9	6282	46.3
Age	47.2	(10.3)	49.8	(10.4)
Civil status				
Single	222	25.0	2601	19.4
Married/cohabiting	665	75.0	10,786	80.6
Children at home				
No	417	47.1	6964	47.8
Yes	468	52.9	6385	52.2
Occupational status				
Unskilled manual worker	192	21.3	2034	15.0
Skilled manual worker	147	16.3	2300	16.9
Assistant non-manual	143	15.9	1883	13.9
Intermediate non-manual	255	28.3	4331	31.9
Professionals, executives, higher non-manual	164	18.2	3020	22.3
Yearly income from work (SEK)	3345.6	(1651.6)	3748.7	(1970.8)
Sector				
Private	554	63.8	7148	54.7
Public	314	36.2	5931	45.3
Contractual work hours				
Fulltime	707	83.0	10,831	82.6
Part-time	145	17.0	2279	17.4

and public sector. Lastly, to evaluate our chosen cut-off on the scale on affective job insecurity, we chose to perform the same main analysis with a cut-off of ≥3 instead of ≥4, as applied in the original analysis.

3. Results

3.1. Descriptive statistics

The distributions of cognitive job insecurity and affective job insecurity at baseline by sociodemographic factors at baseline are given in Tables 1 and 2. In Table 3, we provide the incidence of purchasing psychotropic drugs by type of job insecurity. Cognitive job insecurity (Table 1) was reported by 21% (n = 3030) of the respondents while only around 6% (n = 901) reported affective job insecurity (Table 2). Looking at the overlap between these constructs, 24% of those reporting cognitive job insecurity did also report being exposed to affective job insecurity. Of those exposed to affective job insecurity, 80% reported also being exposed to cognitive job insecurity (data not shown). Among those experiencing cognitive job insecurity, a larger proportion were men, private sector workers and fulltime contract workers. The mean follow up time was 2.5 years and 625 cases of incidence purchase of any psychotropic drug were observed. In 174 cases people were taking 2 types of drugs or more (Table 3). Among those exposed to cognitive job insecurity 4.6% made an incident purchase of any psychotropic drug compared to 5.4% among the unexposed. With regard to specific types of psychotropic drugs the incidence was similar in the exposed and unexposed group.

A larger proportion of private sector workers compared to public sector workers was observed among those exposed to affective job insecurity (Table 2). The exposed group further included a larger proportion of people living without a partner and employees from the lowest occupational class. Otherwise, exposed and unexposed to affective job insecurity were similar with regard to sociodemographic factors at baseline. The average follow up time was 2.5 years, 640 cases of incidence purchase of any psychotropic drug were identified and 176 cases with multiple drug purchases (Table 3). Among those exposed to affective job insecurity 8.2% made an incident purchase of any

Table 3
Descriptive statistics on incident purchases of psychotropic drug among those with valid data on each of the three drug types or the combined outcome variable, by exposure to cognitive and affective job insecurity.

| | Cognitive job insecurity | | | |
| | Yes | | No | |
	N	%	N	%
N cases incident users				
Antidepressants	77	2.8	258	2.5
Sedatives	72	2.6	303	2.9
Anxiolytics	80	2.8	322	3.0
Any psychotropic drug	115	4.6	510	5.4
>2 types of psychotropic drugs	43	1.4	131	1.2

| | Affective job insecurity | | | |
| | Yes | | No | |
	n	%	n	%
N cases incident users				
Antidepressants	35	4.4	304	2.5
Sedatives	35	4.2	350	2.8
Anxiolytics	45	5.5	369	2.9
Any psychotropic drug	57	8.2	583	5.2
>2 types of psychotropic drugs	25	2.8	151	1.1

psychotropic drug compared to 5.2% among the unexposed. Incident purchases of antidepressants, sedatives and anxiolytics were all somewhat more common among the exposed compared to the unexposed.

3.2. Job insecurity and incidence purchase of psychotropic drugs

Table 4 presents hazard ratio (HR) from the marginal structural Cox models and 95% confidence intervals (CI). The analyses indicated that being exposed to cognitive job insecurity was not associated with an increased risk of incident purchases of psychotropic drugs (HR 1.15 (95% CI 0.92–1.43)). However, being exposed to affective job insecurity was associated with an increased risk of incident purchases of psychotropic drugs (HR 1.40 (95% CI 1.04–1.89)). From separate analyses on specific types of drugs, we found that both cognitive job

Table 4
Results from marginal structural Cox models on incident purchase of psychotropic drugs in relation to cognitive and affective job insecurity.

	Total *n*	Events *n*, (%)	HR[a]	(95% CI)[b]
Any psychotropic drug				
Cognitive JI	10,879	577 (5.3)	1.15	(0.92–1.43)
Affective JI	10,994	589 (5.4)	1.40	(1.04–1.89)
Antidepressants				
Cognitive JI	11,912	309 (2.6)	1.42	(1.08–1.86)
Affective JI	12,041	312 (2.6)	1.56	(1.05–2.32)
Sedatives				
Cognitive JI	12,187	346 (2.8)	1.14	(0.85–1.52)
Affective JI	12,321	355 (2.9)	1.26	(0.83–1.91)
Anxiolytics				
Cognitive JI	12,316	375 (3.0)	1.19	(0.90–1.58)
Affective JI	12,445	384 (3.1)	1.56	(1.08–2.26)

[a] Hazard ratio (HR) with stabilized weights based on sex, age, civil status, children at home, occupational status, income, sector, contractual work hours
[b] 95% robust Confidence Interval (CI) from bootstrapping

insecurity (HR 1.42 (95% CI1 1.08–1.86)) and affective job insecurity (HR 1.56 (95% CI 1.05–2.32)) were associated with an increased risk of incident purchases of antidepressants. Affective job insecurity increased the risk of incident purchases of anxiolytics (HR 1.56 (95% CI 1.08–2.26)), while for cognitive job insecurity the point estimate indicated an increased risk, but the risk estimate was not statistically significant. Similarly, point estimates for cognitive and affective job insecurity suggested an increased risk of purchases of sedatives but the estimates were not statistically significant. Analyses performed with the lower cut-off on affective job insecurity yielded similar results.

3.3. Stratified analyses

In the additional analyses, (Table 5), women exposed to affective job insecurity had an increased risk of incident purchases of psychotropic drugs (HR 1.75 (95% C 1.23–2.49)), while men did not (HR 0.88 (95% CI 0.48–1.10)). Furthermore, people under 50 years old exposed to cognitive JI seemed to have an increased risk of incident purchases of psychotropic drugs (HR 1.43 (95% CI 1,05–1.93)), while the same was not observed among those 50 years or older (HR 0.91 (95% CI 0.62–1.33)). Lastly, a somewhat higher risk of incident purchases of psychotropic drugs among public sector workers compared to private sector workers exposed to affective job insecurity was observed. Estimates of HRs of incident purchases of psychotropic drugs were similar across the to two work sectors for cognitive job insecurity. However, confidence intervals in the different strata overlapped and tests of interactions did not support significant differences across groups.

4. Discussion

This study found that affective job insecurity increased the risk of purchases of psychotropic drugs, especially antidepressants and anxiolytics, while cognitive job insecurity was only associated with purchases of antidepressants.

To the best of our knowledge, no other study has related affective and cognitive job insecurity to psychotropic drug use in a longitudinal setting. Hence, possibilities of comparing our findings is limited. However, an association between job insecurity and mental health has been concluded in the literature (De Witte et al., 2016), although studies investigating specific aspects of poor mental health using more "independent" measures of mental health, are scarce. One study by Rugulies et al. (2010) found an association between affective job insecurity and purchases of antidepressants, but only among those who also had the experience of a long-term unemployment spell (Rugulies et al., 2010). Their point estimate suggested an increased risk of antidepressant purchases among those exposed to job insecurity in general, compared to unexposed employees, but the association became non-significant when taking baseline depressive symptoms into account. In the present study we also considered prior mental health, but did not adjust for level of depressive symptoms and included a larger sample size, possibly explaining the differences in findings. A previous study conducted in France found a cross-sectional association between job insecurity and psychotropic drugs, but only for men and no longitudinal associations were found when including other poor working conditions. However, information on psychotropic drug use was collected by asking the respondents if they had taken any of the drugs, specified on a list, during the last 12 months, and data collections was done with four years apart. It is possible that the findings in that study are affected by recall bias and that the four-year interval between measurements is too long to detect any effects (Ford et al., 2014).

In our study, affective job insecurity was more strongly associated with purchases of psychotropic drugs than cognitive job insecurity. These findings are in accordance with the general conclusion in the meta-analysis on cognitive and affective job insecurity (Jiang and Lavaysse, 2018). Some previous research has indicated that affective job insecurity is more strongly related to psychological health outcomes, while cognitive job insecurity is more strongly related to work-related outcomes, such as job commitment and satisfaction (Huang et al., 2010, 2012; Ito and Brotheridge, 2007). However, others have found cognitive job insecurity to be of greater importance both for work-related outcomes and for health-related outcomes (Pienaar et al., 2013). There is also support for cognitive job insecurity as a predictor of affective job insecurity (Anderson and Pontusson, 2007) and that affective job insecurity may be a mediator between cognitive job insecurity and psychological well-being (Huang et al., 2012; Vulkan et al.,

Table 5
Results from marginal structural Cox models on incident purchase of psychotropic drugs in relation to cognitive and affective job insecurity, stratified by sex, age and sector.

Sex									
	Women				*Men*				
	Total (*n*)	Events (*n*)	HR[a]	(95% CI)[b]	Total (*n*)	Events (*n*)	HR[a]	(95% CI)[b]	*p*-value[c] for Intercaction
Cognitive JI	5546	348	1.31	(0.98–1.74)	5333	229	0.91	(0.64–1.29)	0.117
Affective JI	5615	357	1.75	(1.23–2.49)	5379	232	0.88	(0.48–1.60)	0.107
Age									
	Younger (<50 years)				*Older (≥50 years)*				
Cognitive JI	5375	269	1.43	(1.05–1.93)	5504	308	0.91	(0.62–1.33)	0.081
Affective JI	5414	274	1.61	(1.09–2.38)	5580	315	1.23	(0.72–2.08)	0.279
Sector									
	Private				*Public*				
Cognitive JI	6164	284	1.17	(0.89–1.52)	4715	293	1.12	(0.78–1.59)	0.993
Affective JI	6209	292	1.31	(0.83–2.07)	4785	297	1.76	(1.10–2.81)	0.426

[a] Hazard ratio (HR) with stabilized weights based on sex, age, civil status, children at home, occupational status, income, sector, contractual work hours.
[b] 95% robust Confidence Interval (CI) from bootstrapping.
[c] *p*-value from interaction on type of job insecurity and stratifying variable.

2015). One potential explanation for why the association between these two constructs of job insecurity and different outcomes varies across studies may be the use of many different scales, wordings and measurements of the two constructs (Staufenbiel and König, 2011; Sverke et al., 2006). We believe our measure of cognitive job insecurity is of a relatively objective kind, as being a mere evaluation of the present situation, more or less free from a normative interpretation. The difference between our measures of cognitive and affective job insecurity may thus be greater than in other studies, such as the one by Pienaar et al., 2013. Another possible explanation for why there was a stronger association between affective job insecurity and psychotropic drugs could be that affective job insecurity is more strongly associated with a stress response. An affirmative response to affective job insecurity may mean that people have evaluated a situation as threatening in line to the transactional stress theory (Lazarus and Folkman, 1984). Several factors may be of relevance for the appraisal of a situation and its effects such as expectations and coping resources. For instance, previous research suggest that job insecurity have more detrimental mental health effects among permanent than temporary contract workers (De Cuyper and De Witte, 2007; Lee et al., 2013). This is often explained by psychological contract theory, i.e. that expectations of job security is higher among permanent employees than temporary employees (Guest, 2004). However, others did not find support for an effect modification by contract type in the association of job insecurity and mental health studying Swedish employees (Virtanen et al., 2011). Furthermore, the measure of affective job insecurity may capture similar elements as the outcome, such as anxiety or worry and the overlap with the criterion variables may be less for cognitive job insecurity. This is possibly related to time invariant factors such as genetics, personality traits, reporting style etc. which in some studies to a large extent seem to explain associations between job insecurity and mental health problems (Caroli and Godard, 2016; Milner et al., 2016). Future research should continue to separate between specific aspects of job insecurity and account for potential problems of endogeneity, in order to understand the association with employee health.

Although we found no statistically significant differences in the associations between age groups, across sex or sectors, some differences were observed. Women exposed to affective job insecurity appeared to have a higher risk of incident purchases of psychotropic drugs compared to men. Similar patterns, but less pronounced were observed for cognitive job insecurity. Previous studies have shown mixed findings concerning the role of sex. Women exposed to job insecurity were found to have an increased risk of incident anxiety disorders while men did not (Plaisier et al., 2007). Another study found an increased risk among men when investigating severe depressive symptoms (Rugulies et al., 2006). Yet several studies have found no support for sex acting as a moderator in the association with psychological wellbeing (Cheng and Chan, 2008; Ferrie et al., 2002; Schutte et al., 2014; Vulkan et al., 2015).

The results suggested that the younger age group was more negatively affected by job insecurity, especially cognitive job insecurity, although not significantly different from the older group. Compared to older workers, younger workers have displayed higher levels of cognitive job insecurity (Anderson and Pontusson, 2007) and younger workers under threat of job loss have been found to be worse off in terms of wellbeing than their older counterparts (Kuhnert and Vance, 1992). It is possible that older workers do not perceive downsizings and dismissals at the workplace as a personal threat to the same extent as younger workers, due to the relatively strict employment protection of permanent workers in Sweden and particularly due to the last-in-first-out principle. A comparison between Swedish and Finnish employees revealed a protective effect against labor market exits of older workers in Sweden due to the last-in-first-out rule Böckerman et al., 2018. However, job loss in later life could also be considered as a type of early retirement and have less harmful effects compared to unemployment early or in the middle of the career (De Witte, 1999).

Yet, difficulties in finding a new job after a job loss is perceived as greater among older workers compared to younger workers (Anderson and Pontusson, 2007; Kuhnert and Vance, 1992), which could explain why some findings showed a stronger association between job insecurity and psychological distress and anxiety among older workers than among younger workers (Cheng and Chan, 2008).

We also investigated type of sector as a potential modifying factor. Cognitive job insecurity was more common among private sector workers than among public sector workers, but no clear differences in risks could be established. Others have also found a lower prevalence of cognitive job insecurity among public sector workers (Anderson and Pontusson, 2007), but sector did not moderate the association between job insecurity and psychological wellbeing (Vulkan et al., 2015). Regarding affective job insecurity, public sector workers displayed a somewhat elevated risk of purchasing psychotropic drugs, while private sector workers did not. A Swedish study comparing the effect of organizational changes on a range of different working conditions found that the working conditions deteriorated more in the public sector than in the private sector. The authors put forward that the low level of control and many obstacles that the public sector workers experienced could be one reason behind this moderating effect of sector (Harenstam et al., 2005). Organizational changes is sometimes described as an antecedent of job insecurity (Keim et al., 2014; Shoss, 2017) and job insecurity is often highlighted as a key mechanism for why organizational change is causing poor mental health (Kivimaki et al., 2007; Kivimaki et al., 2000). It is possible that the somewhat stronger association between affective job insecurity and psychotropic drug purchases in our study is explained by similar factors as in the study by Harenstam et al., 2005. In addition, more women in Sweden tend to work in the public sector and under temporary employment contracts. Employment protection legislation for temporary employment in Sweden is considerable less rigid than for permanent workers, it is among the least secure across all OECD countries (OECD, 2019). Previous research has stressed the role of welfare states, particularly factors such as employment protection legislation, unemployment benefits, spending on active labor market programs, acting as moderators of consequences to mental health of job loss Norström and Grönqvist, 2015 and job insecurity (Anderson and Pontusson, 2007). Therefore, it is important to keep the Swedish context in mind before generalizing findings of the present study to other welfare contexts.

The above presented findings highlight the importance to further consider potential moderating factors such as sex, age and sector when investigating job insecurity and mental health outcomes. This is especially relevant for studies separating between different types of job insecurity and using clinical measures of mental health, as this is still an understudied area.

5. Strengths and limitations

The present study was based on a prospective design which allowed us to examine job insecurity prior to the outcome, increasing the possibility of making causal interpretations. Since exposure and outcome stem from different sources, and the outcome is based on a clinical assessment, common method bias is less likely to influence these findings (Podsakoff et al., 2003), compared with most previous studies. The Nordic health registers, including the Swedish Prescribed Drug Register, are known for their high-quality information and good coverage (Wettermark et al., 2007). However, it should be acknowledged that not all common mental and sleep disorders are treated with psychotropic drugs. Moreover, the prescribed drug register does not cover medication received in ambulatory care, over-the counter at hospitals and medication used in nursing homes are covered to a limited degree. Furthermore, the reason for treatment could be other than mental health problems or than the main indication for that drug type. Swedish medical guidelines for example suggest antidepressant for some anxiety disorders and for cognitive behavioral therapy to be considered

(National Board of Health and Welfare, 2017; Swedish Medical Products Agency, 2013). In addition, there is a high level of co-morbidity across these different mental health problems (Cox and Olatunji, 2016; Johansson et al., 2013), therefore many people redeem combinations of different types of psychotropic drugs. These issues make interpretation of the results complicated and reduces the possibility to draw conclusions about associations between job insecurity and different types of mental health problems. Moreover, factors such as socio-economic position, sex and age may influence health care use and help-seeking behavior. Hence the probability of being represented in the drug register may differ, but all prescriptions redeemed at Swedish pharmacies are registered in the Swedish prescribed drug register, regardless of one's employment situation.

Another strength is that we applied marginal structural cox models, within the counterfactual framework, which is suggested be more efficient in dealing with confounding and thereby allowing more robust causal conclusions (Hernán et al., 2000; Williamson and Ravani, 2017). One of the main benefits with using marginal structural models is their capability of dealing with time-dependent confounders (Hernán et al., 2000). Unfortunately, in the present study we were only able to include confounders measured at baseline thereby not fully able to account for time-dependent confounding. Moreover, although we adjusted for a range of factors that could confound the estimates, there might still be un-measured confounding by e.g. endogeneous factors (Caroli and Godard, 2016; Milner et al., 2016). Despite using information on exposure and outcome from different sources to minimize the risk of bias associated with a person's reporting style, personality may still act as confounding factor affecting the ability to make strong causal conclusions about associations between job insecurity and purchases of psychotropic drugs.

Furthermore, the study relies on a fairly representative sample of the Swedish working force. The SLOSH study follows participants of the Swedish Work Environment Survey, which consisted of gainfully employed people. Hence the study sample is likely to consist mainly of people established on the labor market, and people with a history of short, temporary contracts or with limited contracted hours may not be well represented in the present study. It has been indicated that job insecurity is related to employment precariousness and labor market attachment (Louie et al., 2006; Waenerlund et al., 2011), and that being in a precarious work situation is associated with an increased risk of being prescribed psychotropic drugs (Moscone et al., 2016). This raises the possibility for selection bias and an underestimation of the association of job insecurity and purchases of psychotropic drugs. Furthermore, we used relatively strict inclusion criteria, excluding any purchases prior to baseline, resulting in a healthy sample, which could have led to an underestimation of associations between job insecurity and any psychotropic drug use.

6. Conclusion

This study indicates that affective job insecurity increases the risk of psychotropic drug treatment likely associated with mental or sleep disorders and significant disability. This suggests that policy and practice interventions limiting affective job insecurity can reduce the mental health burden among the working population. The study further highlight the importance of separating between different types of job insecurity and to consider potential moderators such as sex, age and work sector.

Limitations

Although several covariates were accounted for in the analyses and different sources of information on exposure and outcome in order to reduce common method variance bias, unmeasured confounding cannot be ruled out. Unfortunately we were only able to include confounders measured at baseline thereby not fully able to account for time-dependent confounding. Furthermore due to a sample based on gainfully employed individuals, people in very precarious jobs may not

be well represented leading to underestimation of the associations.

CRediT authorship contribution statement

Sandra Blomqvist: Data curation, Writing - original draft, Writing - review & editing. **Tianwei Xu:** Data curation, Writing - review & editing. **Paraskevi Persitera:** Data curation, Writing - review & editing. **Lena Låstad:** Data curation, Writing - review & editing. **Linda L. Magnusson Hanson:** Data curation, Writing - review & editing.

Deceleration of Competing Interest

None.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jad.2020.01.078.

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