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Youth unemployment and functional somatic symptoms in adulthood: results from the Northern Swedish cohort

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Background: Little is known about the possible long-term health consequences of youth unemployment. Research indicates that unemployment may lead to socioeconomic downward mobility and mental health problems, but we still lack knowledge of the long-term health consequences of youth unemployment. This article examines the potential long-term association between youth unemployment and functional somatic symptoms in adulthood. **Methods:** The 'Northern Swedish cohort' was used with data from five data collections, from 1981 (age 16) until 2007 (age 42). Youth unemployment was measured as months in unemployment between age 16 and 21, and health outcome as functional somatic symptoms (an index of 10 items of self-reported symptoms). Linear regression was used to analyse the relationship between months in youth unemployment and functional somatic symptoms at age 21 and age 42, stratified for women and men and adjusted for potential confounders, such as time spent in education at age 21 and later unemployment between age 21 and 42. **Results:** Youth unemployment was significantly related to functional somatic symptoms at age 21 for men after controlling for confounders, but not for women. Among men, the association remained for functional somatic symptoms at age 42, after controlling for confounders. **Conclusions:** Adolescence seems to be a sensitive period during which unemployment could have remaining health effects in adulthood, at least for men, though assumptions of causality are tentative and more research is needed.

Introduction

Work has a central part in most individuals' lives. It meets the requirements of both material needs (income security and social protection) and social needs (self-esteem and identity, social interaction, time structure and feeling of purpose and participation in society).¹ Unemployment, i.e. involuntary lack of paid work, is related to individual ill-health.^{2,3} During the last 25 years, young people are those who have had the highest levels of unemployment, in Sweden and other OECD countries.⁴ Even so, we still lack knowledge of the long-term health consequences of youth unemployment. Particularly, knowledge is lacking regarding health problems in the borderline between psyche and soma, such as functional somatic symptoms. These have been shown to be disabling and costly for individuals and society,⁵ and constitute an issue of great public health importance.

Previous studies have shown strong associations between unemployment and concurrent health problems, both mental health problems such as anxiety and depression and physical health problems such as mortality, heart disease, blood pressure and cortisol levels.^{2,3} However, most of these studies are cross-sectional or short-term, and it has been assumed that these health problems improve after re-employment.² In recent years, there has been an increase of studies examining the long-term implications of unemployment. Sociological and economic studies have shown that unemployment may lead to socioeconomic consequences, such as long-term job insecurity, lower wages and downward occupational mobility, remaining after re-employment.^{6–8} There are also public health studies indicating that unemployment may lead to long-term mental health consequences and lowering of the long-term baseline of well-being.⁹ A Swedish study on unemployment and ill-health in different age groups shows that unemployment spells during youth

have stronger health implications than unemployment spells during early adulthood, particularly for poor psychological health and smoking,¹⁰ indicating the need to further explore the relationship between youth unemployment and ill-health with longer follow-up times.²

Young people entering the labour market are faced with special challenges.^{11,12} They often have difficulties finding work, due to lack of experience and networks in the labour market,⁶ and if they become unemployed the risk of further unemployment in adulthood is higher than for employed peers.¹³ It has been suggested by developmental psychologists that the transition time between school and work is an important phase in maturation for young people, and that unemployment may delay this development.¹⁴ It is a time when they should develop their identities and socialize into adulthood.^{14,15} From a life course perspective, youth could therefore be seen as a sensitive period of time when unemployment spells could potentially have stronger implications for ill-health in adult age than unemployment during other periods of life.¹⁶ Youth unemployment could also be a starting point for a social chain of risk, where early exposure to unemployment leads to further socioeconomic disadvantage and adult unemployment, which in turn leads to ill-health in adulthood.¹⁷ However, young people also have the alternative option of continuing their education, particularly in Sweden, where all education is free of charge and there is a well-developed student loan system. Continued education can be an individual's first choice, but it can also be a strategy to avoid unemployment.

The research field on youth unemployment and health generally focuses on internalized mental health outcomes.² One of the less studied health outcomes in relation to unemployment is 'functional somatic symptoms', which is, as mentioned earlier, on the borderline between psyche and soma. This concept refers to

physical symptoms, such as headaches, abdominal pain, musculoskeletal pain, dizziness and fatigue, which are closely related to anxiety and depression.^{5,18–20} However, they represent a separate dimension and are not fully explained by internalized mental health symptoms.^{5,21} They have also been shown to be related to long-term mental health problems such as suicide.¹⁹ Functional somatic symptoms often differ between women and men;¹⁸ in childhood the levels are similar for girls and boys, but from early adolescence onwards, girls and women generally report higher levels than boys and men.^{21,22}

The aim of this study was to analyse the potential long-term associations between youth unemployment and functional somatic symptoms in adulthood, after controlling for functional somatic symptoms in youth, socioeconomic background, education and later adult unemployment.

One challenge is to account for potential health selection. We know that causal relationships between unemployment and ill-health can go both ways²³—people with health problems can have more difficulties getting a job. In this study, we have the possibility to control for functional somatic symptoms before exposure to unemployment, and therefore decrease the potential confounding of health selection into unemployment.

Methods

Participants and data collection

The 'Northern Swedish cohort' was initiated in 1981 and the sample base consists of all pupils (506 girls and 577 boys), who studied or should have studied in their last year of compulsory school in a medium-sized Swedish industrial town. Data were collected at ages 16, 18, 21, 30 and 42 with comprehensive questionnaires concerning labour market experiences, family situation and socioeconomic conditions, health and health behaviour. At the latest follow-up the participant rate (of those still alive in the original cohort, $n = 1071$) was 94.3% ($n = 1010$).²⁴ The exceptionally high response rate is due to several factors, such as invitations to class reunions and an intensive effort to contact all participants.²⁴ The effective sample for the current analyses was $n = 962$ (502 men and 460 women), due to some internal dropout. An analysis of the internal dropout did not show any significant differences in relation to gender, education at age 21 or socioeconomic at age 42. A more detailed description of the cohort is published elsewhere.²⁴ The Regional Ethical Review Board in Umeå, Sweden, approved the data collection and this study.

Measurements

Exposure

Unemployment was defined as lack of job in combination with being able to work and actively looking for a job. The operational definition of 'youth unemployment' (age 16–21) was mainly based on questionnaire data. In the questionnaire at age 18, respondents were asked how many weeks they had been unemployed between ages 16 and 18. At age 21, unemployment was measured with a battery of questions about their labour market situation each semester and each summer since the last follow-up at age 18. Each period was recoded into number of months. If they reported another labour market position in addition to unemployment for one period, the number of unemployment months was divided by two for that period. The two unemployment variables were added to a continuous variable of months in unemployment between age 16 and 21, range 0–47.

Health outcome

'Functional somatic symptoms' at age 21 and 42 were measured as an index based on 10 items of self-reported physical symptoms.

Eight symptoms were asked for in a question formulated: Do you have or have you during the last 12 months had any of the following: 'headache, migraine', 'other stomach ache', 'nausea', 'backache, hip pain, sciatica', 'fatigue', 'breathlessness', 'dizziness', 'overstrain'; coded as 'no', 'yes, light' and 'yes, severe'. In addition, the items 'palpitations' and 'sleeping difficulties', based on other questions, were added to this index. The item 'palpitations' was based on a question about whether participants had experienced nervous problems during the past 12 months, where participants who responded 'yes' could select six different types of nervous problems, palpitations being one of them, and in a follow-up question could report how often they had nervous problems ('never', 'sometimes' or 'often/always'). For sleeping difficulties, participants were asked in a separate question how often they experienced sleeping difficulties during the past 12 months, with the options 'never', 'sometimes' or 'often/always'. All items were added, with the sum score of the index ranged from 0 to 20 (Cronbach's alpha age 21—0.698 and age 43—0.782). Factor analysis indicates strong covariation for items in the index (at age 21—28.15% and age 42—35.65% of explained variance).

Covariates

Health-related selection into youth unemployment is controlled for by adjusting for 'functional somatic symptoms at age 16' (measured and coded the same way as the outcome variable, Cronbach's alpha age 16—0.699).

'Time spent in education' is coded from questionnaire data as level of education at age 21: 'compulsory school', i.e. no education from age 16 to 21 or those who started secondary education but did not complete, 'upper secondary education', i.e. 2–3 years of upper secondary school after compulsory school and 'at least one semester in higher education', i.e. complete upper secondary school plus further studies from age 19 to 21. The variable is based on two different questions in the survey at age 21, one asking for level of education and one asking for numbers of semesters spent in university studies between 18 and 21. In the analysis dummy variables were used, with 'compulsory school' as reference category.

'Unemployment in adulthood' (age 21–42) was measured by a battery of questions about different labour market positions per half-year periods, from the last two follow-ups at age 30 and 42. From this battery, the variable 'months in unemployment age 21–42' was calculated, with a range of 0–174.

'Parents' occupational class' was based on participants' reporting at age 16 of parents' occupation. In accordance with Swedish classification system in the 1980s, each parent was classified into three groups: higher white-collar workers and entrepreneurs, lower white-collar workers and blue-collar workers including manual and non-manual workers.²⁵ The variable used in the analysis was coded as 'both parents white-collar workers', 'one parent blue-collar worker' and 'both parents blue-collar workers'. 'Both parents blue-collar workers' was used as reference category.

We also controlled for 'living arrangements, parents' health and parents' unemployment' when participants were 16 years old, without meaningful changes in the results (data not shown). Living arrangements at age 16 was self-reported as 'parents' or 'adopted parents', 'single parent' and 'parent and step-parent'. Parents' somatic and mental health and alcoholism was reported at age 16 with multiple options and coded as 'no health problems reported for either parent', 'health problems reported for one parent' and 'health problems reported for both parents'. For deceased parents, participants were encouraged to respond based on the situation when the parent was alive. Parents' unemployment was based on participants reporting of parents' employment status at age 16 and coded as 'no parent in unemployment' and 'at least one parent in unemployment'. Personality traits could also be considered as potential confounders. From the questionnaire at age 16, two personality scales which were potential confounders

Table 1 Distribution of dependent and independent variables

	Total sample (n)	Women	Men	Difference between women and men, <i>p</i>
Months in unemployment, mean score (SD)				
Age 16–21	995	4.54 (7.76)	4.83 (8.89)	0.58 ^a
Age 21–42	981	10.13 (19.08)	12.51 (25.23)	0.10 ^a
Functional somatic symptoms, mean score (SD)				
Age 16	992	3.71 (2.51)	3.03 (2.53)	<0.01 ^a
Age 21	966	3.18 (2.44)	2.49 (2.53)	<0.01 ^a
Age 42	986	4.76 (3.50)	3.75 (3.03)	<0.01 ^a
Parents' occupational class^c at age 16, %				
Both parents white-collar workers	300	30.5	29.5	0.63 ^b
One parent blue-collar worker	335	34.4	32.6	
Both parents blue-collar workers	366	35.1	38.0	
Time spent in education at age 21, %				
Compulsory school	128	12.6	13.1	<0.01 ^b
Secondary education	733	68.6	78.2	
At least one semester in higher education	135	18.8	8.7	

^at-test ^bChi-square ^cIf participants had a deceased parent or lived with only one parent, the occupation of the parent with whom they were living was considered. If a parent was unemployed, the last occupation was considered

were included as covariates in complementary analyses: Gunnella Westlanders index of self-worth and Srole's anomie scale.^{24,26} Controlling for these variables did not show any meaningful changes in the results (data not shown). Type A personality was also tested but was not a confounding variable.

Analyses

Descriptive statistics are presented in table 1. Gender differences were tested with *t*-test for linear variables and Chi-square test for categorical variables. The density plot of functional somatic symptoms age 21 and 42 showed a positively skewed (1.35 for age 21, 1.05 for age 42) continuous distribution since most respondents only experience a few of these symptoms. A strong covariation could be assumed between youth and adulthood unemployment, but the values of the variance inflation factor indicated that there was no multicollinearity problem.

Crude and multivariate linear regression was used to analyse the relationship between months in youth unemployment (age 16–21) and functional somatic symptoms at age 21 and 42, stratified for women and men. Adjustments were made for functional somatic symptoms at age 16, parents' occupational class, educational level at age 21 and months in unemployment in adulthood (age 21–42).

Logistic regression was also tested, with the outcome dichotomized at the 75th percentile and the exposure dichotomized at six or more months of unemployment, with similar results (data not in table). SPSS 21 was used for all analyses.

Results

As shown in table 1, mean number of months in unemployment age 16–21 and age 21–42 was relatively low, because over half of the participants (53.7% age 16–21, 55.2% age 21–42) lacked exposure to unemployment (data not in table). A majority had completed high school, but less than a fifth of women and less than a tenth of men had any university experience. Overall, participants scored low on functional somatic symptoms, though women scored higher than men on all three occasions.

Table 2 shows a significant relation between unemployment between ages 16 and 21 and functional somatic symptoms at age 21 for women and men, and for men at age 42 (model 1), remaining after adjustments for functional somatic symptoms at age 16 and parents' occupational class at age 16 (model 2). For men, the associations remained when controlling for educational level at age 21 (model 3) and months in unemployment in adulthood, ages 21–42 (model 4).

Table 2 Linear regressions for months in unemployment between age 16 and 21 on functional somatic symptoms at age 21 and 42 (range 0–20) stratified by women and men

Women				
	Model 1	Model 2	Model 3	Model 4
Outcome at age 21 (n = 460)				
Constant	3.03	1.76	2.93	–
<i>B</i> (<i>p</i>)	0.04 (0.02)	0.03 (0.04)	0.02 (0.23)	
<i>R</i> ² adjusted	0.01	0.14	0.16	
<i>P</i> -value for the model	0.02	<0.01	<0.01	
Outcome at age 42 (n = 461)				
Constant	4.62	3.75	4.59	4.39
<i>B</i> (<i>p</i>)	0.03 (0.12)	0.03 (0.18)	0.02 (0.35)	0.02 (0.50)
<i>R</i> ² adjusted	<0.01	0.03	0.03	0.04
<i>P</i> -value for the model	0.12	<0.01	<0.01	<0.01
Men				
	Model 1	Model 2	Model 3	Model 4
Outcome at age 21 (n = 502)				
Constant	2.29	1.14	2.00	–
<i>B</i> (<i>p</i>)	0.04 (<0.01)	0.04 (<0.01)	0.03 (<0.04)	
<i>R</i> ² adjusted	0.02	0.15	0.16	
<i>P</i> -value for the model	<0.01	<0.01	<0.01	
Outcome at age 42 (n = 495)				
Constant	3.53	3.07	3.35	2.84
<i>B</i> (<i>p</i>)	0.05 (<0.01)	0.04 (<0.01)	0.04 (0.02)	0.03 (0.04)
<i>R</i> ² adjusted	0.02	0.08	0.08	0.10
<i>P</i> -value for the model	<0.01	<0.01	<0.01	<0.01

Model 1: Bivariate. Model 2: Adjusted for functional somatic symptoms at age 16 and parents' occupational class at age 16. Model 3: Adjusted for model 2 and education at age 21. Model 4: Adjusted for model 3 and months in unemployment in adulthood between age 21 and 42.

Discussion

On the results

In this study, we have shown that for men, there were long-term associations between youth unemployment and functional somatic symptoms in adulthood, regardless of later unemployment experiences, education and earlier functional somatic symptoms. For women, youth unemployment was associated only with functional

somatic symptoms at age 21, but this was explained by education. To the best of our knowledge this is the first unemployment study that tests functional somatic symptoms as outcome.

These results of long-term associations between youth unemployment and health for men are in accordance with a British study on unemployment and mental health, where accumulated unemployment age 16–50 was related to distress at age 50.²⁷ Earlier analyses on our cohort showed long-term association of youth unemployment with mental health in adulthood.⁹ These previous studies have only examined long-term unemployment (6 or 12 months of unemployment). Our study indicates that each month in youth unemployment is associated with a higher level of functional somatic symptoms in adulthood for men. Associations among men remained after controlling for education, indicating that the results apply both to participants who continue to higher education and to those who do not.

Because the association among the men also remained after controlling for later unemployment, the association between youth unemployment and adult functional somatic symptoms is not due to accumulated unemployment over the life course or to a social chain of risk, where early unemployment leads to further unemployment. Instead, this supports the idea of adolescence as a sensitive period,¹⁶ though more research is needed. Of course, a social chain of risk could be mediated through other socioeconomic consequences of youth unemployment, such as financial strain and temporary positions in the labour market,^{6,7,28} something which should be explored in future research. Another possible mediator is health behaviour: previous research has shown that unemployed youths, particularly young men, have higher tendency to change their health behaviour, such as increased alcohol consumption and smoking.^{2,24}

We lack a good explanation for why a long-term association was found only among men. As in other OECD countries, the youth unemployment rate was about the same among young men and women.⁴ Previous research on the same cohort has shown a significant association for both women and men between recent unemployment and several health measures,²⁹ and between youth unemployment and internalized mental health symptoms in adulthood.⁹ In this study, there were no significant associations for women between youth unemployment and functional somatic symptoms, even though women tend to score higher than men on functional somatic symptoms.

On the methods

One strength was the extensive follow-up time and high response rate, where vulnerable people who usually decline participation have been included. In the cohort, the youth unemployment rate is low but higher than unemployment levels in Sweden during that time.³⁰ In the 1980s, Sweden had a labour market policy aimed at providing young people with traineeships in the public sector,³¹ but this policy was not fully implemented and a significant proportion of young people were still in open unemployment.³² The cohort is comparable to the Swedish population as a whole with regard to demographic and socioeconomic factors as well as illness and health behaviour. Because it is a closed cohort, it is ethnically more homogeneous than the general population of today.²⁴

Young people suffering from functional somatic symptoms are often challenged with educational and social trouble; they are more absent from school, fall behind in schoolwork, have more strained relationships with classmates and fewer hobbies.¹⁸ However, they rarely receive the health care they need because of the complexity of the clinical picture.³⁰ This may lead to a higher risk of becoming unemployed and a chain of risk into adult unemployment¹³ as well as gradual accumulation of illness and negative health behaviours.^{10,31} But since the associations remained after controlling for functional somatic symptoms in compulsory school at age 16, before entering the labour market,

we believe that the association between youth unemployment and adult functional somatic symptoms is not explained by health selection. There might be some residual confounding due to other potential confounders related to childhood and adolescence, and it is, thus, necessary to be careful regarding assumptions of causality.

A difficult question is whether it is necessary to control for potential diagnosed diseases with similar symptoms. With an index based on symptoms described in general terms, measuring the severity of symptoms and in a relatively short time span, our index met the requirements of Zijlema et al.⁵ review of functional somatic symptoms. By creating an index of symptoms, we can capture an underlying correlation between variables, while not losing statistical power.³³

In this study, continuous variables have been used to the extent possible, as quasi-continuous scales of months in youth unemployment and later unemployment and functional somatic symptoms. However, several of the confounding variables were by nature categorical or ordinal. In comparison with continuous variables, categorical variables contain less information and thus there might be residual confounding that we have not managed to control for.

Conclusion

Youth unemployment was associated with functional somatic symptoms, short-term and long-term for men, after controlling for health selection, socioeconomic background, education and later unemployment. For women, there was a short-term but no long-term association, but this was explained by education. This result indicates that there might be long-term consequences of youth unemployment, at least for men, although assumptions of causality are at best tentative and more research is needed.

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Conflicts of interest: None declared.

Key points

- Previous research has shown strong associations between unemployment and concurrent health problems. However, there is a lack of knowledge regarding the associations with long-term health outcomes.
- This longitudinal study found a short-term and long-term association between youth unemployment and functional somatic symptoms for men. This indicates that there might be long-term consequences of youth unemployment. Though assumptions of causality are tentative and more research is needed.
- Research is needed to further explore the long-term relation of youth unemployment and functional somatic symptoms in adulthood—mechanisms of how unemployment has implications for health as well as gender difference in the association—to prevent individual suffering and costs for society.

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