

Psychological health, self-reported physical health and health service use

Risk differential observed after one year of unemployment

M. Studnicka, A. Studnicka-Benke, G. Wögerbauer, D. Rastetter, R. Wenda, P. Gathmann, and E. Ringel

Psychosomatische Abteilung, Allgemeines Krankenhaus der Stadt Wien, Psychiatrische Universitätsklinik, Wien, Österreich
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Summary. One year after the closure of a furniture factory the health consequences of long-term unemployment were studied among the 215 former employees and an interviewer-administered questionnaire was used to measure psychological health, self-perceived physical health and health service use. Those remaining unemployed 12 months after the closure were found to be 8 times more likely to report poor psychological health than were the re-employed (Odds ratio (OR): 8.5; 95% CI: 4.2–17.0). Self-reported physical ill-health was generally thought to be respondents to be due to former work (56 percent of all disorders were related by subjects to former work history) and was also found to be associated with current employment status (OR 5.6; 95% CI: 2.7–11.5). Health services were over-utilized by the unemployed (OR 2.2; 95% CI: 1.2–4.1) and this differential was demonstrated to be even greater for the older and those reporting more diseases. Given the increasing proportion of long term unemployed in many Western countries this health service over-utilization will impose a substantial burden on public health expenditures unless other means of psychological and social support are provided.

From the early 1980s the structure of unemployment in Europe has changed. While the number of persons unemployed has decreased, the mean duration of unemployment per person has increased from about one month and a half in 1980 to about four months in 1987 (Studnicka and Scheiber 1988). Due to the health consequences of being on the dole this hitherto unnoticed long-term unemployment will have a major effect on expenditure of health services (Harris and Smith 1987).

Recently psychometric studies (Warr and Jackson 1985; Bolton and Oatley 1987; Frese and Mohr 1987) have produced consistent evidence of short-term mental health impairments caused by unemployment, but effects on morbidity and mortality are still debated (Smith 1985). The consequences of unemployment in terms of health service use have only recently been investigated and over-utilization by the unemployed (Linn et al. 1985; Beale and

Nethercott 1986) has been interpreted as a consequence of misdirected help seeking behaviour (Dooley and Catalano 1985), resulting from psychological impairment, or as sick role behaviour (Kasl et al. 1975) adopted by the unemployed to overcome the unemployment stigma.

As we were particularly concerned about the consequences of long-term unemployment we set up a study to involve all former employees of a furniture factory and contacted them one year after the closure. Although we allowed for an induction period of one year, it was thought to be unlikely on biological grounds that we would observe any consequences of unemployment in terms of physical health status. On the other hand, changes in the self perception of physical health were anticipated as a possible result of psychological ill-health. Furthermore self-perceived physical health was regarded as being of particular relevance to investigating whether the unemployed differed from the reemployed with respect to their use of health services (Kasl and Cobb 1966). Such differences were proposed on the basis of studies done in the US (Linn et al. 1985), the UK (Beale and Nethercott 1986) and Canada (D'Arcy and Siddique 1975) and of data from a recent sample of the Austrian population (Eichwalder 1985). Those investigations reported between 1.6 and 4.9 fold increases in health service use. Increases of that magnitude would indicate a major public health burden, especially for those countries where the unemployed remain health insured and the use of health service facilities is free of charge.

Methods

The study population consisted of subjects formerly employed by a furniture factory in a small rural town in the north-east of Austria and took place in June 1986. When contacted 215 former employees (88% of those 244 employed before the closure) agreed to answer the questionnaire. Of the 29 non-respondents, 25 refused to participate and 4 could not be traced (3 had left the area and one died). Among those 25 who declined to be interviewed

Table 1. Study population by age, sex and status of employment

Age (years)	≤ 30		31–45		46 ≥	
	M	F	M	F	M	F
Unemployed	4	4	12	4	36	6
Reemployed	36	6	29	5	24	6

there were 9 unemployed, 14 reemployed and 2 pensioned. Thus no selection bias was detected, as the employment status of participants (Table 1) and non-participants did not differ significantly (Chi-square = 0.30, $P > 0.1$).

Data analysis was restricted to participants who were either unemployed or reemployed at the time of the survey. Consequently 23 pensioners, one woman on maternity leave and two men on military duty were excluded. A further 17 junior apprentices were also excluded as they were not permanent employees; all were younger than 20 years of age and had worked in the factory for about one year only before it closed. The final study population therefore consisted of 172 persons (Table 1).

The interview, which took place in the home of the former employees, lasted for twenty minutes and assessed the items as presented in Table 2.

Unemployment was defined as being currently registered with the regional employment-office, as unemployed at the 1st of June 1986. For a subgroup of 33 unemployed the answers concerning employment status were validated against the register of the regional employment office and were shown to be in complete agreement. The mean duration of unemployment was 11 months (SD 2 months) for the unemployed versus a mean of 5 months (SD 4 months) for the presently reemployed. In the analysis, status of employment was treated as a dichotomous variable. Age was categorized into three (or two) strata: up to 30 years, 31 to 45 years (up to 45 years) and 46 or more years.

The questions relating to “diseases/disorders”, “causes” and “treatment” were open-ended and were coded into categories before data analysis. These categories were formed by looking simultaneously at the answers given by all subjects. The answers on physical health were classified quantitatively as suffering from “zero”, “one”, “two” or “three or more” diseases/disorders and dichotomized for stratification in “up to one” and “more than one” disease. A further evaluation of these responses involved a qualitative classification according to

Table 2. Items of questionnaire administered to study population

Duration of employment at furniture factory
Former level of employment at furniture factory
Number of job applications in the previous year
Former experience of unemployment
Restrictions on daily life experienced due to financial strains
Employment status of married partner
Diseases/disorders suffered from in the previous year
Respondents views as to possible causes of diseases/disorders
Treatment for diseases/disorders
Standardized 9 item rating scale of psychological health

the organ system. Respondents views as to possible causes of these diseases/disorders were coded as “attributed to work” or “not attributed to work”. Treatment was coded as “no treatment”, “self-treatment”, “seen by a physician during last year” or “hospitalized in last year” and dichotomized into “no use” and “use” of health service.

The rating scale of psychological well-being has previously been used by other researchers on unemployment and demonstrated to be a reliable measure of psychological health (Brinkmann and Potthoff 1983). It consists of nine items, five of them taken from the Zerssen-scale (Zerssen 1976) and four from the Berkman-scale (Berkman 1971). By summarising the scores of the single items of the rating scale, a psychometric variable with a range of 9 to 27 was obtained. The overall mean score of the study population was 11 and those scoring above the mean were considered to be manifesting psychological ill-health.

As a measure of effect the odds ratio (OR) was used, which approximates to the prevalence ratio – the ratio of prevalence of disease among unemployed to the prevalence of disease among reemployed (Kleinbaum et al. 1982). 95% confidence intervals (95% CI) of ORs were calculated and stratified analysis employed to adjust for confounding variables. Any risk factor apart from employment status thought to influence psychological health, physical health or health service use was considered as a possible confounder. Given the small number of confounders involved and in order to keep a clearer understanding of the data, stratified analysis rather than a multivariate technique was employed. Any 95% CI not including “1” indicates an association significant at the level of $P < 0.05$.

Results

Data analysis was divided into three stages. Firstly the relationship between employment status and psychological well-being was investigated. Secondly the effects of former work history and of present employment status on self-perceived physical health were estimated. Thirdly the relationship of health service utilization to physical health, psychological health and employment status was investigated.

Psychological health

Psychological ill-health showed the strongest association with the present employment status. The unemployed were more than 8 times more likely to report poor health than were the reemployed (OR 8.5; 95% CI 4.2–17.0). This relationship was also assessed by simple linear regression, where duration of unemployment and psychological health score were treated as continuous variables. The resulting regression equation yielded an answer consistent with the categorical approach:

$$\text{psychological health(score-units)} = 11.03 + 0.16^* \text{ duration of unemployment(month);}$$

$$(r = 0.237, P = 0.02).$$

Table 3. Odds ratios for psychological ill-health in unemployed versus re-employed

	Cases	Controls	Odds Ratio	95% Confidence intervals
Crude	66	106	8.5	(4.2–17.0)
Adjusted for age:			6.5	(3.0–14.0)
≤ 30	8	42	2.5	(0.5–12.9)
31–45	16	34	5.4	(1.5–19.6)
46 ≥	42	30	11.7	(3.8–35.7)
Adjusted for sex:			8.6	(4.2–17.8)
male	52	89	10.3	(4.6–22.9)
female	14	17	4.3	(0.9–20.1)
Adjusted for former level of employment:			8.3	(4.1–17.1)
white-collar	18	22	15.8	(3.3–74.4)
blue-collar	48	84	7.0	(3.2–15.5)
Adjusted for physical health:			6.9	(3.3–14.7)
up to one disease	33	90	6.5	(2.7–15.6)
more than one disease	33	16	8.2	(2.1–31.4)
Adjusted for former unemployment ^a			6.6	(3.1–13.7)
no	35	85	8.3	(3.4–20.1)
yes	30	18	4.1	(1.2–14.4)

^a Due to missing values on 4 subjects $n = 168$

With respect to the association of psychological health and unemployment the following variables were examined as possible confounders: age, sex, former level of employment, physical health and former experience of unemployment (Table 3).

With increasing age the association of unemployment and psychological ill-health became more pronounced and the age-adjusted OR (6.5; 95% CI 3.0–14.0) was found to be of comparable magnitude with the crude estimate. The OR for male unemployed was 10.3 (95% CI 4.6–22.9) vs 4.3 (95% CI 0.9–20.1) for female. Among former white-collar workers the OR was found to be 15.8 (95% CI 3.3–74.4) whilst only 7.0 (95% CI 3.2–15.5) for former blue collar workers, and was not dependent upon the number of diseases reported. Among those who had never experienced a spell of unemployment at any point in their history the association of current unemployment with psychological ill-health was twice as strong (OR 8.3; 95% CI 3.4–20.1) as among those who had experienced unemployment before (OR 4.1; 95% CI 1.2–14.4). Altogether none of the confounding variables tested for invalidated the association between unemployment and psychological ill-health as present in the crude analysis.

Table 4. Frequencies of diseases/disorders and attribution to former work history

Diseases/disorders	No.	% of total disorders	Attributed to work (%)
Musculoskeletal system	79	42	80
Cardiovascular system	23	12	26
Gastrointestinal system	18	9	55
Accidents	13	7	8
Common colds	11	6	45
Nervous disorders	6	3	66
Hearing disorders	6	3	50
Others	32	17	40
Total	188	100	56

Other strains possibly experienced among the unemployed beside the psychological illhealth due to loss of status and social contacts were thought to be daily life restrictions and unemployment of married partner. But neither of the two hazards was found to differentiate significantly in terms of psychological health among subgroups of unemployed, possibly due to low power. The OR for daily life restrictions versus psychological ill-health was calculated as 1.2 (95% CI 0.3–4.2) and the estimate for being married to a partner presently unemployed was 2.7 (95% CI 0.8–9.1).

Physical health

Evaluation of physical ill-health in terms of the systems involved revealed that disorders of the musculoskeletal system were by far the most frequent and were attributed in 80% of cases to their former work history (Table 4). However out of 23 diseases/disorders related to the cardiovascular system, only 6 were reported to be caused by former working conditions. For gastrointestinal, nervous and hearing disorders the opposite was true, and more than half of the time they were described as work related.

During in-depth interviews, which were performed with a subsample of 33 unemployed subjects (Ringel et al. 1987), disorders of the back were explained by the necessity of repeatedly carrying heavy parts of furniture, nervous disorders were attributed to “stress” experienced through the last years of insecure employment, gastrointestinal diseases were attributed to the toxic fumes of the paint shop and hearing problems were explained by high noise exposure. Surprisingly unemployment was never stated as a possible cause for present disorders. This assessment of self-reported physical health stresses the fact that bad working conditions may be regarded as the major cause of self-perceived ill-health in many individuals.

Table 5. Odds ratios for physical ill-health in unemployed versus re-employed

	Cases	Controls	Odds ratio	95% Confidence intervals
Crude (by disease/disorder reported):				
zero	18	53	1.0	
one	15	37	1.2	(0.5– 2.7)
two	12	11	3.2	(1.2– 8.5)
three or more	21	5	12.3	(4.0–37.4)
Crude (by “up to one” versus “more than one” disease/disorder reported)				
	66	106	5.6	(2.7–11.5)
Adjusted for age:				
– 45			3.9	(1.8– 8.5)
46 –	24	76	4.1	(1.2–13.1)
	42	30	3.8	(2.7– 5.3)
Adjusted for sex:				
male			5.9	(2.8–12.3)
female	52	89	6.2	(2.8–13.7)
	14	17	4.2	(0.7–26.1)
Adjusted for former level of employment:				
white-collar			5.6	(2.7–11.8)
blue-collar	18	22	2.9	(0.7–12.1)
	48	84	7.1	(3.1–16.3)
Adjusted for psychological health:				
poor			4.2	(1.9– 9.6)
good	47	24	4.7	(1.5–14.7)
	19	82	3.8	(1.2–11.6)
Adjusted for attribution to work:				
no			4.8	(2.1–11.3)
yes	34	79	6.7	(1.9–23.8)
	32	27	3.7	(1.2–11.3)

When self-perceived health was analyzed with respect to employment status (Table 5), the odds for unemployed to report physical ill-health increased with the number of diseases/disorders. For reporting one disease/disorder the OR was estimated at 1.2 (95% CI 0.5–2.7), for reporting two diseases/disorders 3.2 (95% CI 1.2–8.5) and for reporting three or more diseases 12.3 (95% CI 4.0–37.4).

In a further analysis an overall crude OR was calculated by using “up to one disease” as cut-off point, and the OR estimate of 5.6 (95% CI 2.7–11.5) was found to be unbiased by any of the confounders.

To assess the validity of responses on physical health and health service use, the answers of the 33 unemployed subjects were validated against notes from local general practitioners (Ringel et al. 1987). Despite a more detailed description of physical parameters like blood-pressure or serum enzymes in the physicians’ notes, there were no discrepancies observed for symptomatic diseases/disorders.

Health service use

The crude OR relating unemployment to health service use was found to be 2.2 (95% CI 1.2–4.1) and the following variables were controlled for as confounders: age, sex, former level of employment, psychological health and physical health (Table 6).

Apart from physical health none of the confounding variables substantially distorted the crude estimate. But stratification for diseases/disorders showed possible under-utilization among the less symptomatic and over-utilization among those reporting more than one disease/disorder. The self-perceived state of physical health was found to be strongly associated with health service use

as the crude OR estimate relating these two variables was found to be 25.0 (95% CI 8.9–67.3). Given this high correlation, self-perceived health could be regarded as an intermediate step between unemployment and health service use, and hence controlling for it as a confounder would possibly obscure a real differential in health service use.

Discussion

We observed a strong association between unemployment and psychological ill-health and the OR of 8.5 (95% CI 4.2–17.0) remained significant and of similar magnitude after controlling for confounders. Male unemployed, older unemployed, those who reported more physical disorders, those who had formerly worked at a white collar level and those who had experienced prior unemployment appeared to show greater psychological distress.

The observed sex-difference in psychological distress might result from the possibility for retrenched females to return to the socially accepted ‘house wife’ role (Starrin and Larsson 1987). Age and disability are known to diminish the chances of re-employment and could therefore influence the psychological state of the unemployed. Some of the white collar workers in our sample referred to the factory as their life’s work and appeared to show very high work-commitment, which could have made them more vulnerable to the loss of employment (Ringel et al. 1987).

Among the unemployed, restrictions of daily life due to financial difficulties did not modify the psychological experience, which might be explained by the large redundancy sums received in our sample.

The findings on psychological health and unemployment have to be regarded carefully, as a selection bias in

Table 6. Odds ratios for health service use in unemployed versus re-employed

	Cases	Controls	Odds ratio	95% Confidence intervals
Crude	66	106	2.2	(1.2-4.1)
Adjusted for age:			1.6	(0.8-3.3)
-30	8	42	0.8	(0.1-4.2)
31-45	16	34	1.6	(0.5-5.5)
46-	42	30	2.0	(0.8-5.2)
Adjusted for sex:			2.2	(1.1-4.1)
male	52	89	2.7	(1.3-5.5)
female	14	17	0.9	(0.2-3.3)
Adjusted for former level of employment:			2.3	(1.2-4.3)
white-collar	18	22	1.7	(0.5-6.2)
blue-collar	48	84	2.5	(1.2-5.2)
Adjusted for psychological health:			1.5	(0.7-3.1)
poor	47	24	1.4	(0.5-3.8)
good	19	82	1.6	(0.6-4.4)
Adjusted for physical health			0.8	(0.3-1.9)
up to one disease	33	90	0.7	(0.3-1.8)
more than one disease	33	16	1.4	(0.6-9.3)

favour of the reemployed could have lead to an overestimation of risk. When analysing the association between psychological health and unemployment, we found no evidence that the unemployed of poor mental health had completed fewer job applications, the OR for job applications versus psychological ill-health being 0.4 (95% CI 0.1-1.4). However selection due to employers' decisions to offer jobs to people with good psychological health could not be ruled out. On the other hand social isolation arising from long term unemployment as well as the social stigma of being a burden to society might well initiate poor mental health (Jackson, 1988), and these sequences of the psychological side of unemployment have consistently been reported by other researchers (Mohr and Frese 1981; Strotzka and Leitner 1969).

The predominance of self-reported musculoskeletal problems found in our study population seems to be attributable to the former manufacturing process, as high prevalences of musculoskeletal disorders are well documented for workers exposed to lifting and carrying heavy materials (Kelsey and Golden 1988).

Nervous disorders expressed by some of the former employees were related to the "anticipation-period" of unemployment, (Cobb and Kasl 1977) the threat of redundancy preceding job-loss. Although we could only document this influence on psychiatric morbidity retrospectively, others have observed it in follow-up studies (Cobb and Kasl 1977; Beale and Nethercott 1985; Jenkins et al. 1982).

Analysing physical health quantitatively we demonstrated a dose-reponse relationship for employment status and physical health, but nevertheless a direct biological link between unemployment and morbidity seems unlikely. Changes in self-perception of physical ill-health as well as health determined selection processes on the labour market may well account for this differential.

For health service use we demonstrated a two-fold greater demand by the unemployed, an estimate of similar size as reported previously (Linn et al. 1985; D'Arcy and

Siddique 1975; Eichwalder 1985). However, for females, for those younger than thirty and for those reporting less than two diseases/disorders, the OR point estimate was found to be below unity. A similar pattern had been described by Beale and Nethercott (1986) where over-utilization was predominantly among older and male unemployed.

Physical ill-health per se showed a strong association with health service use. Given the fact that long-term unemployment increases the awareness for symptoms of ill-health, self-perceived health status can be regarded as an intermediate step linking unemployment and health service use. Although reported by others (Williams et al. 1986) psychological ill-health was not found to increase the probability of consulting over and above the effect of unemployment itself. The high prevalence of psychological ill-health observed among the unemployed in our sample (47 out of 66 unemployed (= 71%) reported poor psychological health) could easily have obscured such a relationship.

Conclusion

Surveying former members of a furniture factory, we observed those who remained unemployed as to be of poorer mental and physical health and to report a greater use of health services. Although the absence of a control group does not permit a direct assessment of causality, nevertheless the observed differentials between unemployed and re-employed, that evolved over the one year period were analogous to the current structural changes in the labour market as a whole.

The unemployed suffer from psychological impairment, possibly as a consequence of social stigma and isolation, and represent the older and less healthy members of the labour force. Given the increasing duration of unemployment in Western countries, health services will be faced with a group of predominantly older unemployed,

who tend to utilize these facilities more, thus placing an increasing burden upon them. In the light of that evidence, local centres providing psychological and social support might represent a more appropriate and cost effective solution for dealing with the needs of long-term unemployed.

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M. Studnicka, M.D.M.Sc.
Matznergasse 6/4
A-1140 Wien
Austria