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Employment status changes of workers after referral to an occupational disease clinic

Ayse Coskun Beyan[1], Yucel Demiral[1] and Arif Cimrin[1]

[1]Dokuz Eylul University Medical Faculty, Department of Occupational Medicine, İzmir, Turkey

Abstract: Objective: Occupational diseases (OD) are among the most significant issues of work life, with economic, medical, social, and ethical aspects. The majority of studies concerning OD focus on the causes or medical outcomes of OD. There are a limited number of studies investigating the social and economic impacts of being diagnosed with an OD. One of the important social aspects of OD is the employability of workers after an OD diagnosis. The aim of this study is to evaluate the changes in employment status after the OD diagnosis process. **Methods:** This is a cross sectional study. There were 204 eligible cases, and 198 (97%) completed the study. The study data were obtained from patient files, including OD Committee reports and questionnaires applied via telephone interview. **Results:** Among the 198 applicants, 170 (85.9%) were male and 146 (73.7%) were diagnosed with an OD. Of these workers, 106 (53.5%) had quit their current jobs. Of those workers, 89 out of 106 were in the OD group, and 17 were in the non-OD group. Diagnosis with OD (OR: 3.1 CI: 1.4-6.8) and non-union membership (OR: 11.1 CI: 5.2-23.5) increased the likelihood of quitting the job after an OD diagnosis. **Conclusion:** The short-term prognosis of OD was relatively poor. OD diagnosis or even referral to an outpatient clinic may cause quitting the job. Policies should account for the risk of unemployment after an OD diagnosis, and OD surveillance systems should obtain data on the employment status of workers following diagnosis.

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Correspondence to: A. Coşkun Beyan, Dokuz Eylul University Faculty of Medicine, Occupational Medicine Department, Mithatpasa Street, Number 1606, Postal Code: 35330, Balcova/İzmir (e-mail: dr.aysecoskun@hotmail.com.tr and ayse.coskun@deu.edu.tr)

1: Introduction

Occupational diseases (ODs) are among the most significant problems of work life, with economical, medical, social and ethical aspects. According to the estimates of the International Labor Organization, 2 million people per year lose their lives due to ODs and more than 160 million are diagnosed with an OD. Additionally, more than 4% of the gross domestic product of countries is thought to be lost due to work-related accidents and ODs[1)]. Takala et al. have reported 198,000 fatal work-related diseases in a work force of 213 million active workers in the European Zone[2)].

The majority of studies concerning ODs focus on the causes or medical outcomes of ODs. There are a limited number of studies investigating the social and economic impacts of being diagnosed with an OD. One of the important social aspects of OD is the employability of the workers after an OD diagnosis. Some studies highlight both the social and medical impacts of OD, particularly under-estimating the effects of quitting a job and unemployment rates. The negative outcomes of changing a job/profession or unemployment, such as social isolation after diagnosis[3-9)], are well known. The aim of this study is to evaluate the changes in employment status of the workers after referral to an OD out-patient clinic in a university hospital.

2: Material and Methods

2.1. Study Sample and Data collection

This study was conducted in the Dokuz Eylul University OD outpatient clinic. The study was planned to include all of the patients that applied to the outpatient clinics between October 2013 and December 2014 and continued treatment at least one month after the OD report issued. There were 204 eligible cases, and 198 (97%) completed the study. Study data were obtained from patient files, including OD Committee (ODC) reports and questionnaires applied via a telephone interview. Verbal consent was obtained from all participants.

Ethical approval for the study was obtained from the DEU non-Interventional Ethics Committee (date : 22.01.2015, number: 2015/02-03, 2.2 Occupational disease council resolutions).

The outpatient clinic of Dokuz Eylul University (DEU) accepts patients referred by their workplace physicians, the Social Security Institution (SSI), or specialist physicians. The cases are first evaluated by the OD outpatient clinic, and then different department's consultations are obtained when necessary. After the final examinations, a report is issued by the ODC. ODC reports comprise 5 sections. The first section consists of sociodemographic data and applicant characteristics such as age, gender, marital status, educational background, referring institution, habits, and data on any chronic disease. The second section contains a detailed work history and data on working conditions, including information about the related sector and the duration of past work. The third section focuses on clinical assessment. The fourth section consists of data concerning the discussions of the OD Committee. The status of the OD diagnosis is obtained from this section. In the conclusion section, the final decision on patient's status is indicated.

There are two possible outcomes:

1) No OD or normal: Individuals with no disease or those whose existing disease was not associated with their job. 2) OD diagnosis, which is categorized based on the OD List of Turkey[10].

2.3. Questionnaire

Questionnaires were performed via phone calls. Before applying the questionnaire, the participants provided verbal informed consent. Questionnaires consisted of information on four main domains of variables. The first part contained questions focusing on the employment status of the person after issuing of the ODC report. If the employee had been dismissed, the second part detailed information about the dismissal process, including changes in the monthly income. The third part determined the presence of a labour union and membership status. The last part addressed legal processes after the OD diagnosis.

Employment status was categorized into 4 groups:

a) Working in the same workplace and doing the same job: describes workers with no changes in job history after the ODC report.

b) Working in the same workplace but doing a different job: Describes workers who work in the same place but in a different department after the ODC report.

c)Working in a different workplace: Describes workers who left their previous workplace and started to work at a different place after the ODC report.

d)Unemployed: Participants who were not working at any work.

The workers were categorized into 3 groups.

Still working: Describes the sum of the workers in groups a, b and c.

Quit working: Describes workers who left the place of employment that they were working for during their outpatient clinic application (i.e., the sum of the workers in groups c and d).

Unemployed workers: Describes only the workers in groups d.

Smoking status

Smoker: Workers who currently smoke.

Non-smoker: Workers who have never smoked.

Quit smoking: Workers who had quit smoking for at least 6 months.

Existence of Chronic disease: Workers diagnosed with chronic illness by a doctor.

Social Security Institution: The agency that regulates insurance activities, and the authority for compensation claims and disability assessment in Turkey.

2.4. Statistical Analysis

Descriptive findings were expressed as mean and standard deviation, and minimum and maximum values. The dependent variable of the study was the employment status after the ODC report. Cross tables were created to evaluate the relationship of resignation after visiting the OD outpatient clinic to gender, age, duration of work, duration of education, presence and membership in a labor union, and diagnosis of OD. Categorical variables were evaluated by the chi-square and Fisher's exact tests. The results were expressed as the Odds Ratio (OR) and 95% confidence interval to estimate the dependent variable (e. g. employment status). Multiple logistic regression analysis was performed for those the variables which significantly affected the employment status in the univariate analysis. P values < 0.05 were accepted as significant. The entire analysis was carried out by the SPSS 15.0 package program.

3: Results

Sociodemographic characteristics of the participants are shown in Table 1. Among the 198 outpatient clinic

applicants, 170 (85.9%) were male and 28 (14.1%) were female. The mean age was 38.1±7.1 years (min: 21 yrs, max: 61 yrs). With regards to education, 76 (38.4%) had graduated from primary or secondary school, and 122 (61.6%) had graduated from high school or university.

Table 1. Sociodemographic characteristics and chronic diseases status of all participants

	n: 198	%
Age (years)		
Mean±SD	38.1 ± (7.1) Min-max (21-61)	
Gender		
Male	170	85
Female	28	14
Educational background		
Primary or secondary school	76	38
High school or university	122	61
Marital status		
Living with a spouse	173	87
Single	25	12
Smoking status		
Smoker	81	40
Non-smoker	39	19
Quit smoking	78	38
Existence of Chronic disease		
Yes	17	8
No	181	91
OD status		
Having OD	146	73
No OD	52	26

Of the 198 patients, 146 (73.7%) were diagnosed with OD. The remaining 52 (26.3%) workers either had no disease or their disease was not associated with their occupations. In order of frequency, OD diagnoses were asthma and COPD (57 cases, 39%), silicosis and other pneumoconiosis (54 cases, 36%), disc hernia (27 cases, 18%), and lead intoxication (3 cases, 2%) (Table 2). Of the 198 workers, 124 (OD group) and 46 (Non-OD group) worked in the industrial sector, while 22 (OD group) and 6 (Non-OD group) worked in the service sector. Detailed occupations were given in Table 2. Membership in labor unions differed between the groups, with 50 (34.2%) union members in the OD group and 27 (51.9%) union members in the non-OD group (p=.01, Table 3).

There was a significant difference between OD group and non-OD groups with regards to employment status (p <.001) (Table 3). After presentation in the outpatient clinic, 106 (53.5%) of all workers had quit their current jobs. Of these 106 workers, 89 were in the OD group, and 17 were in the non-OD group. Of the workers in the OD group, 39 (26.7 %) left their workplace and started work at a new workplace, while 50 (34.2%) became unemployed. In the non-OD group 5 workers (9.6%) left their workplace and started to work at a new workplace, while 12 workers (23.1%) became unemployed. Meanwhile, 57 of the 198 (28.8%) workers continued working in the same workplace and at the same department, and 35 (17.7%) were transferred to other departments in the same workplace. Of the 146 OD workers, 23 (15.8%) stayed in the same workplace and in the same department, 34 (23.2) stayed in the same workplace but were transferred to another department, and 89 (61.0%) quit their job. Of

Table 2. Distribution and work status of OD workers (N: 146)

	Workers who quit (groups c and d)	Still working (groups a and b)	Total	Occupations (number of workers)
	89	57	146	
Diseases caused by chemical agents*	1	2	3	Lead smelting workers (3)
Pneumoconiosis and other respiratory diseases**	69	43	112	Ceramic workers (46), dental technicians (34), metal workers (9), sandblasters (3), ship repairman (1), painters (6), metal workers (4), coal mine workers (6), cleaners (5)
Diseases caused by physical agents***	19	12	31	Call center operators (2), nurses (3), ceramic workers (12), dental technicians (4), printing workers (1), cleaners (3), coal mine workers (6)

Employment groups: a) Working in the same workplace and doing the same job. Describes workers with no changes in their job history after ODC report. b) Working in the same workplace but doing a different job. Describes workers who work in the same place, but in a different department after the ODC report. c) Working in a different workplace. Describes workers who left their previous workplace after the ODC report. d) Unemployed. Participants who were not working at any work.

*ICD 10 codes: T56-Lead intoxication (3 cases)

**ICD 10 codes: C45-mesothelioma (1case), J44-COPD (1 case), J45-Asthma (56 cases), J62-J68-Silicosis and other pneumoconiosis (54 cases)

*** (ICD 10 codes: H91-Hearing loss (4 cases), M50-M51-M54-Disc Hernias (27 cases)

Table 3. Work life characteristics and monthly income status of the participants

	Workers with OD		Workers with no OD		*P*
Sector	n: 146	%	n: 52	%	
Industry	124	84.9	46	88.5	.07
Service	24	15.1	6	11.5	
Member of a labor union					
Yes	50	34.2	27	51.9	.01
No	96	65.8	25	48.1	
Duration of work (year)					
0-4.9	48	33.1	18	34.6	
5-9.9	44	30.3	12	23.1	.04
>10	53	36.6	22	42.3	
Working status after OD council report					
Working in the same workplace and at the same job (Group a)	23	15.8	34	65.4	*p*<.001
Working in the same workplace but at a different job (Group b)	34	23.3	1	1.9	
Working in a different workplace (Group c)	39	26.7	5	9.6	
Unemployed (Group d)	50	34.2	12	23.1	
Perceived change in monthly income					
No change	69	47.2	38	73.0	.02
Increased	5	3.4	1	1.9	
Decreased	72	49.3	13	25.0	

Significance tested using the chi-square test

those that quit, 39 (26.7%) started to work in a different workplace, and 50 (34.2%) became unemployed (p <.001). The Social Security Institution is the only competent authority institution to assess disability and determine compensation in Turkey. Universities do not have the right to determine disability and compensation. Therefore, our study could assess how many OD cases left their jobs due to their disability.

Monthly income was decreased in 72 (49.3%) workers in the OD group, but remained the same or increased in 39 (74.9%) workers in the non-OD group (p=.02) (Table 3). There were no income differences in workers with OD who were working in the same workplace with the same job. However, 9 (25%) of the workers with OD who transferred to different department declared a decrease in their income.

In the OD group, of the 89 workers who have changed their job or remained unemployed, 18 (13.4%) had left their job on their own will. The most common cause for changing their workplace was the concern about long-term health outcomes. Of the remaining 71 workers, 14 (15.7%) had left their job upon employer's request with an agreement on the indemnity payment, and 57 (64.0%) had been dismissed from their job without their approval. In the non-OD group, 2 (3.8 %) out of 52 had voluntarily left their job, 2 (3.8 %) left upon their employer's request, and 13 (25.0 %) were dismissed from their job without their approval. The remaining workers continued to work in the same job (not shown in the table).

Among the applicants, there was no difference between age groups in the relation to the employment status (p =.33). Female workers (71.4%) were more likely to leave their jobs than male workers (50.1%) after OD diagnosis (p=0.04). Similarly, higher percentages of primary or secondary school graduates (63.2%) quit their job after diagnosis than workers with higher education levels (47.5%) (p=.04). There was no statistical difference in the seniority of the workers and job loss after diagnosis (p=.39). However, union membership significantly affected the employment status after diagnosis, as seen in Table 4. Approximately three-quarters (73.6%) of the non-union members quit their job, compared with only 22.1% of the union members (p<.001). Of the OD patients, 61.0% had become unemployed, compared to only 32.7% of non-OD patients (p<.001). With regards to workplace size, 71.7% of the workers who were working in a place with less than 50 employees had left their jobs, compared to 37.7% of the workers who are working in a workplace with more than 51 employees (p<.001).

Of the 146 employees diagnosed with an OD, 59 (40.4%) had received legal counselling from the SSI, while 37 (25.3%) and 15 (10.3%) had received legal counselling from a lawyer/law firm or a friend, respectively. Among the 146 patients diagnosed with an OD, 37 (25.3%) had filed a suit for a disability grant, and 20 (13.7%) for an indemnity payment. Eighty (54.8%) work-

Table 4. Employment status of participants after presentation to the clinic

		Groups a and b		Groups c and d		*P*
		n: 92	%	n: 106	%	
Age	<35	32	42	44	57	.33
	≥35	60	49	62	50	
Gender	Male	84	49	86	50	.04
	Female	8	28	20	71	
Duration of work						
<5years		28	40	42	60	.39
5-10 years		25	48	27	52	
>10 years		39	52	36	48	
Education						
Primary or secondary school		28	36	48	63	.04
High school or university		64	52	58	47	
Union membership						
Yes		60	77	17	22	.001
No		32	26	89	73	
Workplace size						
<50 employees		26	28	66	71	.001
>51 employees		66	62	40	37	
Diagnosis of OD						
Yes		57	39	89	61	.001
No		35	67	17	32	

P values calculated using a chi-square test.

Table 5. Multivariate analyses of factors associated with workers quitting their job

Variable	OR	95 %CI
Age		
<35*		
≥35	0.91	0.44-1.88
Gender		
Male*		
Female	1.76	0.64-4.84
Education		
Primary or secondary school*		
High school or university	1.68	0.82-3.47
Union membership		
Yes*		
No	11.1	5.2-23.5
Diagnosis of OD		
No*		
Yes	3.1	1.4-6.8

*indicates the reference category.

ers had not taken legal action. The legal proceedings have not ended in any of the cases (Not shown in the table).

For multivariate analyses, a logistic regression model was constituted using the variables age, gender, and education, duration of work, union membership status, and diagnosis of OD. Although workplace size was a significant factor in univariate analyses, it was not included in the logistic regression model because it showed a high level of correlation with union membership status (r=.72, $p<.001$). Diagnosis with OD (OR: 3.1, CI: 1.4-6.8) and not being a member of a union (OR: 11.1, CI: 5.2-23.5) were found to be a risk factor for quitting a job (Table 5).

4: Discussion

Of the 146 workers diagnosed with an OD, 89 (61%) quit their job and 50 (34.2%) became unemployed. In the non-OD group, 17 (32%) workers quit their job. OD diagnoses were found to be a risk factor for quitting a job (OR: 3.1, 95% CI: 1.4-6.8) even after adjusting for age, gender, education and union membership. The quit rate after diagnosis of OD observed in this study was approxi-

mately two times higher than the rates reported in similar studies. Piirila et al. found the quit rate after diagnosis of occupational asthma was 14% in Finland[5]. Lazarov et al. focused on occupational dermatitis patients and found that the quit and unemployment rates were 28.6% and 32.8%, respectively[8]. Roquelaure et al. found the quit rate was 18% for musculoskeletal disorders[11].

Our study has two major differences from other studies found in the literature. First, in all of the studies mentioned above, at least one year had elapsed between the diagnosis of OD and assessment of employment status. However, in this study the participants were evaluated 1 month after OD diagnosis. The higher rates obtained in our study suggest that quit rates may be higher within the first months after diagnosis of OD, and then decrease over time. Similar to our study, Holness et al. conducted a study on occupational dermatitis patients in Italy which revealed a job changing rate of 32% and an unemployment rate of 38% six months after diagnosis[12]. In other studies, some of the employees who quit may have found a new job. This shows that assessment time is important in evaluating the employment status of people after a diagnosis of OD. Kauppi et al. evaluated workers with occupational asthma six months after the diagnosis and also found a high unemployment rate (49%)[13].

Secondly, unlike our study, the studies mentioned above focused on only a restricted group of ODs (occupational asthma, occupational dermatitis, and occupational musculoskeletal disorders). Particularly in diseases such as occupational asthma, as exposure to allergens continues, respiratory complaints become aggravated over time. In our study, no selection was performed, and the employment status of workers after diagnosis of varying types of OD was evaluated. Despite this change, the unemployment rates of our study were higher than in studies focusing on allergic ODs. These results suggest that country-specific parameters such as the responsibility of the workplace to prevent ODs, law enforcement, and the perceptions of the employer, employee, and workplace physician about ODs all play an effective part in employee quit rates.

One of the striking findings of our study was that 32% of the applicants quit their jobs without OD diagnosis. This finding might show that even an investigation of OD can threaten employment status. An OD diagnosis could be considered a reason to change the employee's job, but without such a diagnosis, worker quitting needs further discussion. This can be explained in several ways. Quitting of the non-OD workers after application to the outpatient clinic could be because of employers' perception of the threat of compensation and possible fines following the diagnosis. Therefore, there should be programs for employers to raise their awareness and their corporation's social responsibility. Secondly, in the course of the outpatient's clinic investigation process, workers may get stigmatized. Stigmatization is well documented for workers with chronic diseases such as HIV and Diabetes Mellitus at the workplaces[9]. Azaroff et al. pointed out that workers with OD who report health problems to their occupational safety professionals or colleagues may stigmatized due to their problems in the workplaces. Furthermore, the compensation system may also lead to job loss, difficulties in obtaining future employment, and social stigma for the patient[14].

In Turkey, there is no OD surveillance system fitting the recommendations of the ILO on protection and prevention[15]. The Ministry of Health and the Ministry of Labour and Social Security do not keep records or monitor OD. Only two studies have addressed this subject, and they report the interval for granting indemnity payment for OD as 2-4 years[16,17]. Akkurt evaluated the health and employment status of 47 occupational asthma cases after diagnosis in 2000. Two cases had quit their jobs, 6 cases were transferred to other jobs in the same workplace without considering the recommendations of medical reports, and 1 case had died because of an asthma attack due to failure to change the employee's job in the workplace. In that study, a social security arrangement could be finished in only 6 of the cases, and the highest disability rate was 11%. In the present study, 37 (25.3%) of the patients diagnosed with OD applied to the SSI for a disability grant; however, none of the cases reached a legal conclusion in 14 months. This shows that although it has been 16 years since Akkurt's study, there has been no change in legal proceedings in Turkey.

Procedures for indemnity payments or disability grants are reported to take up to 5 years in various countries. However, Holland and Belgium differ from Turkey in having systems that ensure rehabilitation and return to work after an accident or diagnosis of OD, while warning the employer to take preventive and protective measures for related accidents and OD. For example, in Holland the social security system is funded by employers and requires that protective measures and cautions to be taken in the workplace for employees diagnosed with OD. There, employees with OD are transferred to a more suitable job in the same workplace while ensuring the same amount of salary[18]. In Turkey, it is a fact that such indemnity-focused OD report systems are inadequate in stimulating protective and preventive measures.

In Turkey, according to the legal regulations the employee should be placed in a suitable job after diagnosis of OD[19]. However, our study showed that although 34 (23.2%) workers were transferred to a different department in the same workplace, 23 (15.8%) workers continued to work in the same department without any modification. Roquelaure et al. reported that two years after OD workers filed a compensation claim, 65% of the claimants had returned to their work in the same company. No ergonomic enhancement was made for 38% of workers who

returned to their jobs (9% received ergonomic enhancement), while 18.3% were assigned to a different task in the company as a result of their impairment[11]. Lazorov et al. found that a change in the type of work was recommended for 46 (65.7%) workers, and that tasks had been modified for 24 (34.3%) workers. Lazarov emphasizes that employers are not willing to make work modifications in the workplace unless strict legal obligations and inspections are formed[8]. Thus, workplaces with a diagnosis of OD should be frequently inspected. In Turkey, according to the 2014 report of the Turkish Labour Inspection Board, only 58 inspections had been performed due to the diagnosis of OD[20]. This result shows that workplace inspections are not sufficiently performed and that deterrent punishment is not given. Thus, employers ignore the necessary arrangements.

In our study, we found 72 (49.3%) workers reporting an OD-related reduction in monthly income. Vandenplas et al. reported a loss of income rate of 62% in workers with occupational asthma[3]. Amelie et al. found that 46% of patients reported a reduction of income[7]. They emphasized that even workers who remained employed in the same company were affected due to sickness or a lack of promotions. Brant et al.[21] pointed out that even finding a new job and being a new employee is related to loss of income. Due to these economic consequences, Birdi et al. reviewed 29 studies regarding occupational asthma management, and they have suggested that reduction of exposure was less likely to result in loss of income[6]. Speereuvers et al. pointed out that because the registries of various European countries differ considerably in definitions, criteria for notification and recognition, and legal and social security measures, it can be inferred that the level of underreporting varies between countries[22]. As a result of all these economic reasons, it has been well documented that OD diagnoses are underreported in many countries, including developed ones[14]. However, the primary target of an OD registration and report system should be to use them in implementing preventive measures for OD[15]. Employers should be encouraged to take preventive actions in their workplaces.

In the present study, being a union member was found to be a protective factor for quitting the job after presenting to the OD clinic (OR: 11.2%, CI:5.2-23.5). This finding, in conjunction with our other results, indicates that job insecurity may be an influential factor during and after diagnosis of OD. Greenhalgh and Rosenblatt define job insecurity as follows: "*the perceived powerlessness to maintain desired continuity in a threatened job situation*"[23]. In our study, significantly higher quit rates among those with no union membership suggest that job insecurity is an important element in the process of OD diagnosis. This result suggests that in addition to the negative outcomes of OD, employees also face health and social problems associated with job insecurity.

Our study has some limitations. This study was performed only a short time (1 month) after the ODC report was issued, which may cause shortcomings in evaluating the quit rate and the unemployment rate. Our clinic admits patients referred from other centers or the SSI, which may cause a high diagnostic rate for OD (bias toward null hypothesis). The cross-sectional structure of the study fails to reveal the cause-effect relationship, as in other cross-sectional studies. Working status information was obtained only through questionnaires. In Turkey, the SSI is the only authorized center to assess disability. Therefore, we did not determine how many of OD cases had quit their jobs due to their disability.

5: Conclusion

In conclusion, the short-term prognosis of OD was relatively poor. Our study has shown that even applying to an OD outpatient clinic may cause unemployment. The provisions protecting the jobs of workers with OD should be considered. Rather than losing employees due to diagnosis of OD, the employer should eliminate risks in the workplace and regard the diagnosis of OD as an opportunity to prevent more serious outcomes. In order to accomplish preventive actions, occupational health diagnosing centers should employ multidisciplinary teams that include industrial hygienists and social workers along with the other medical staff that allows OD to be addressed comprehensively.

Policies and regulations should account for the risk of unemployment after OD diagnosis and even after the OD outpatient clinic application. OD surveillance systems should obtain data on the employment status of the workers after diagnoses, and reports in the workplace should be intended to monitor worker health and well-being. Employers may also be given the responsibility for finding new jobs for affected employees, as well as warranting preventive actions in the workplace.

Conflicts of interest: None declared.

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