

Social and Work-Related Factors on Employment Status of Coronary Heart Disease Patients

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ABSTRACT

Objective: Due to their clinical status, coronary heart disease (CHD) patients experience difficulties during their daily activities, which includes their work life. Their quality of life, in general, is negatively affected. The aims of this study were to determine changes in employment status after diagnosis of CHD and sociodemographic, clinical and work-related factors affected.

Methods: This is a retrospective cohort study. Participants were selected from the Manisa Public Health Directorate database; of Turkey. Inclusion criteria encompassed residence in inner Manisa Districts, employment at an income-generating job, and a diagnosis of CHD for the first time (n=41) by a doctor between 01.12.2012–01.12.2013. A cohort of without CHD (n=73) was also recruited for the study for comparison. Chi-square tests and logistic regression analyses were performed to exam the relationship between dependent and independent variables.

Results: It was found that 76% of patients returned to work within a year after receiving a diagnosis of CHD. However, the lay-off rate was found to be significantly higher among employees with CHD than others ($p<0.05$). There was no relationship found between being laid off and having a comorbidity ($p>0.05$). In the evaluation of all study participants, blue-collar and private sector employees had significantly higher lay-off rates compared to white-collar and public sector employees.

Conclusion: After a CHD diagnosis, 24% of CHD patients cannot return to work. People in a lower occupational class experience a higher rate of lay-off, which may make life economically worse for these individuals. Social life and working conditions should be taken into consideration when evaluating whether CHD patients should return to work.

Key words: coronary heart disease, return to work, employment, work factors

INTRODUCTION

After the 1960s a significant reduction was observed in the incidence of coronary heart disease (CHD), especially in developed countries. However, until the 1990s, while CHD incidence was decreasing in the United States and Western Europe, it was still increasing in Eastern Europe (1). In recent years, despite a decrease in CHD mortality and morbidity in developed countries, it continues to be responsible for one-third of deaths in people over the age of 35 (2). CHD is also one of the leading causes of disease burden in developing countries (3). As a result of increased longevity, CHD prevalence is expected to maintain its importance over the coming years (4). In many developing countries, CHD and risk factors have increased faster than the development of policies for chronic disease management or necessary regulations in the health systems. Thus, the CHD epidemic in developing countries continues to increase (3). According to a recent estimate based on CHD trends in developing countries, CHD is expected to increase in prevalence from 1990 until 2020, by 120% in women and 137% in men (5).

A study performed in 2011; found CHD prevalence in men ages 35–44, 45–54, and 55–64 in Turkey, to be 1.2%, 5.0%, and 10.9%, respectively. Similarly, CHD prevalence in women in the same age groups were 0.5%, 2.0%, and 6.9%, respectively (6). CHD is a major problem in particular for men between the ages of 45–64. This factor is important when considering work-life; because 15–65 is regarded as working age in Turkey (7). While the labor force participation rate (labor force divided by the total working-age population) of people without any health problems was 56.6% in Turkey, the labor force participation rate of people who had any chronic disease and cardiovascular disease were 40.0% and 31.7%, respectively (8). Likewise, it has been proven that chronic illness, poor health conditions and poor health perceptions lead to an early exit from work-life (9, 10).

While the life expectancy and the employment rate of older age individuals have increased, there have also been increasing workday

losses due to chronic illnesses (11). People with some chronic illnesses leave work because they think they are not fit to work, and as a result, they then have to fight against poverty (11). Thus, it is important for people who have a chronic illness to continue to work to prevent further deterioration of their social life as well as to ensure social justice and economic sustainability of the population at large. There are many factors including social, economic, and familial that may affect a patient's return to work after CHD (12). A qualitative study has shown that CHD patients have different problems involving their work conditions (13). Therefore, it is crucial to understand these factors to improve the quality of life for these patients. The aim of this study was to determine the lay-off rate among patients diagnosed with CHD and as the sociodemographic, clinical status and work-related factors affected.

METHODS

This was a retrospective cohort study, performed between October 2013 and June 2015. The study cohort consisted of 30 to 55-year-old people, who lived in inner Manisa Districts and worked in an income-generating job, that were diagnosed with CHD for the first time according to the ICD-10 code system (including I20-I25) between 01/12/2012 and 01/12/2013.

The participants were selected from the Manisa Public Health Directorate registries. There were 2066 people between 30-55 years of age diagnosed with CHD for the first time according to the ICD-10 code system (including I20-I25). Of those, 932 people were excluded from the study due to a lack of contact information. A flowchart of the study population is presented in Figure 1. The working status of 1134 people was checked using the database of social security records by the researchers and which resulted in an additional 663 people being excluded because they were not working in an income-generating job when they were

diagnosed with CHD. Ultimately, 471 people were eligible for the CHD study cohort. Everyone were called at least two times on different days and were invited to the health center or visited at their home where questionnaires were administered by face to face interviews.

The dependent variable was employment status. Two types of employment status were defined as follows: people who continued to work (working group) and people who became unemployed or retired within one year after diagnosis (lay-off group).

The main independent variable was CHD diagnosis. To confirm their diagnosis, the following two questions were asked to the participants: 'Were you diagnosed with CHD by a doctor?' and 'Were you treated due to CHD?'. If the participant answered yes to one of these questions, and confirmed their willingness to participate, they were included in the study as a CHD patient. The other independent variables were age, gender, educational level, occupational class, economic status, having another employed person in the family, retirement eligibility, employment sector, the level of physical requirements at work, time at the last workplace, psychosocial risk factors at the last workplace, having a history of angiography or angioplasty, or having a prior bypass operation or myocardial infarction or cardiopulmonary resuscitation, or comorbidity. This information was obtained through a self-reported questionnaire. Comorbidity was defined as having at least one chronic disease such as congestive heart failure, hypertension, diabetes mellitus, or chronic obstructive pulmonary disease. All chronic diseases were covered by the question 'Do you have any other chronic diseases diagnosed by a doctor?'. Psychosocial risk factors (quantitative demands at work, influence at work, control over working time, meaning of work, commitment to the workplace, social support, and job satisfaction) were evaluated using dimensions of the valid and reliable Turkish version of the Copenhagen Psychosocial Questionnaire (COPSOQ) (14).

Chi-square tests and logistic regression analyses were performed to exam the relationship between dependent and independent variables. We included independent variables (occupational class, having a CHD) which were significantly associated with a dependent variable in univariate analysis while building logistic regression models. We also adjusted the risk by age and gender according to the literature.

The significance level was set at $p=0.05$. SPSS for Windows (version 15.0; SPSS Inc., Chicago, IL, USA) was used for data analyses. Dokuz Eylül University Ethical Committee has reviewed and approved the study protocol 2014/2205. Verbal and written consent was obtained from all participants. The project was funded the DEU Scientific Research Fund (Project number-2014. KB. SAG. 064).

RESULTS

Study participants included 36 (31.6%) women and 78 (68.4%) men. The percentage of CHD was significantly higher among men than women ($p=0.02$, Table 1). The mean ages of participants

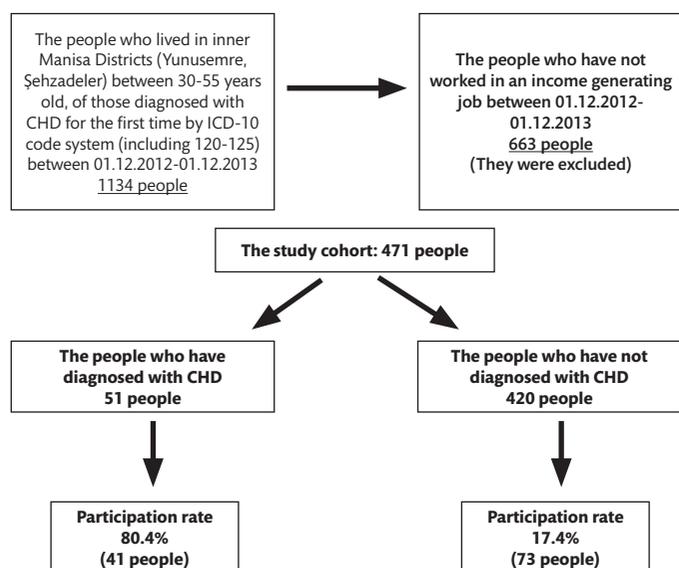


Figure 1. The flowchart of the study

Table 1. The distribution of background characteristics by the presence of CHD

	Coronary heart disease				p
	Yes		No		
	n	%	n	%	
Age groups					
30-39	11	26.8	30	73.2	0.13*
40-49	21	39.6	32	60.4	
50-55	9	45.0	11	55.0	
Gender					
Men	34	43.6	44	56.4	0.02**
Women	7	19.4	29	80.6	
Educational level					
Secondary school	19	40.4	28	59.6	0.39*
High school	8	34.8	15	65.2	
University or higher	14	31.8	30	68.2	
Economic status					
Poor	16	43.2	21	56.8	0.23*
Moderate	14	35.0	26	65.0	
Good	11	29.7	26	70.3	
Occupational class					
White collar	22	32.4	46	67.6	0.33**
Blue collar	19	41.3	27	58.7	
Another employed person in the family					
Yes	21	31.8	45	68.2	0.28**
No	20	41.7	28	58.3	
Deserving retirement					
Yes	32	32.7	66	67.3	0.07**
No	9	56.2	7	43.8	

* Linear-by-linear association.

** Pearson chi-square.

with and without CHD were 44.4±5.9, and 41.7±6.7, respectively (p>0.05). All participants had health insurance. There were no significant differences between those with or without CHD in terms of educational level, occupational class, and economic status (p>0.05, Table 1). There were also no significant differences between those with and without CHD in terms of the presence of another employed person in the household, or the right to retirement (p>0.05, Table 1). As could be expected, the general health perception of CHD patients was significantly poorer than others (p=0.03).

No significant difference was observed between people who were laid off and others with regard to age, gender, educational level, or economic status (p>0.05, Table 2). The lay-off percentage was significantly higher for blue-collar workers compared to white-collar workers (p=0.03). There was no significant relationship between people who were laid off and those who were not for the presence of another employed person in the household, or retirement eligibility (p>0.05, Table 2).

While 75.6% of CHD patients returned to work within one year after diagnosis, 24.4% of were laid off (12.2% were retired and 12.2% were unemployed). In addition, 73.2% of CHD patients felt able to return to work after diagnosis and 68.3% of CHD patients stated that they continued to work due to economic insufficiency. Only 9.6% of the people without CHD were laid off (2.7% were retired and 6.9% were unemployed) in one year.

Table 2. The relationship between background characteristics and lay-off

	Lay-off				p
	Yes		No		
	n	%	n	%	
Age groups					
30-39	5	12.2	36	87.8	0.43*
40-49	8	15.1	45	84.9	
50-55	4	20.0	16	80.0	
Gender					
Men	10	12.8	68	87.2	0.36**
Women	7	19.4	29	80.6	
Educational level					
High school and lower	12	17.1	58	82.9	0.39**
University or higher	5	11.4	39	88.6	
Occupational class					
White collar	6	8.8	62	91.2	0.03**
Blue collar	11	23.9	35	76.1	
Economic status					
Poor	8	21.6	29	78.4	0.05*
Moderate	7	17.5	33	82.5	
Good	2	5.4	35	94.6	
Another employed person in the family					
Yes	10	15.2	56	84.8	0.93**
No	7	14.6	41	85.4	
Deserving retirement					
Yes	12	12.2	86	87.8	0.05**
No	5	31.3	11	68.8	

* Linear-by-linear association.

** Pearson chi-square.

Table 3. The relationship between work-related conditions and lay-off

Work characteristics	Lay-off					
	Yes			No		
	n	%	n	%	p	
Employment sector						
Public	1	2.8	35	97.2	0.01**	
Private	16	20.5	62	79.5		
Levels of physical workload required at work						
Low	4	10.8	33	89.2	0.60*	
Medium	9	18.0	41	82.0		
High	4	14.8	23	85.2		
Working period at the last workplace						
5 years or less	9	19.1	38	80.9	0.28**	
More than 5 years	8	11.9	59	88.1		
Quantitative demands at work						
High	10	16.9	49	83.1	0.53**	
Low	7	12.7	48	87.3		
Influence at work						
High	10	18.2	45	81.8	0.34**	
Low	7	11.9	52	88.1		
Control over working time						
High	7	13.0	47	87.0	0.58**	
Low	10	16.7	50	83.3		
Meaning of work						
High	10	14.3	60	85.7	0.81**	
Low	7	15.9	37	84.1		
Commitment to the workplace						
High	4	7.8	47	92.2	0.06**	
Low	13	20.6	50	79.4		
Social support						
High	7	12.3	50	87.7	0.43**	
Low	10	17.5	47	82.5		
Job satisfaction						
High	6	10.5	51	89.5	0.19**	
Low	11	19.3	46	80.7		

* Linear-by-linear association.

** Pearson chi-square.

Table 4. The relationship between health conditions and lay-off

Health conditions	Lay-off					
	Yes			No		
	n	%	n	%	p*	
Coronary heart disease						
Yes	10	24.4	31	75.6	0.03	
No	7	9.6	66	90.4		
Angiography history						
Yes	10	28.6	25	71.4	0.006	
No	7	8.9	72	91.1		
Angioplasty history						
Yes	5	33.3	10	66.7	0.03	
No	12	12.1	87	87.9		
Bypass operation history						
Yes	0	0.0	2	100.0	0.55	
No	17	15.2	95	84.8		
Comorbidity						
Yes	8	18.6	35	81.4	0.39	
No	9	12.7	62	87.3		

* Chi-square test.

Table 5. Association of sociodemographic variables and CHD by multivariate analysis

	N	Lay-off		
		Univariate OR (95%CI)	Model 1* OR (95% CI)	Model 2** OR (95% CI)
Age groups				
30-39	41	1.00	1.00	1.00
40-49	53	1.28 (0.39-4.25)	1.08 (0.31-3.74)	1.04 (0.29-3.72)
50-55	20	1.80 (0.43-7.60)	1.66 (0.36-7.65)	2.40 (0.47-12.23)
Gender				
Women	36	1.64 (0.57-4.73)	2.59 (0.80-8.40)	3.16 (0.91-10.98)
Men	78	1.00	1.00	1.00
Coronary Heart Disease				
Yes	41	3.04 (1.06-8.74)	3.77 (1.19-11.69)	3.64 (1.12-11.87)
No	73	1.00	1.00	1.00
Occupational Class				
Blue-collar	46	3.25 (1.11-9.54)	-	3.97 (1.22-12.93)
White-collar	68	1.00	-	1.00
R ²			0.061	0.106

* Simultaneously adjusted for age and gender.

** Simultaneously adjusted for age, gender and occupational class.

People who worked in the private sector were more likely to be laid off ($p=0.01$). No significant difference was observed between those who were laid off and those who weren't with regard to physical workload requirements, time at the last workplace, quantitative demands at work, influence at work, control over working time, meaning of work, commitment to the workplace, social support, or job satisfaction ($p>0.05$, Table 3).

A total of 17 participants had a history of myocardial infarction and 2 of them had a history of cardiopulmonary resuscitation. The people who had CHD, and a history of angiography or angioplasty were laid off significantly more than others ($p<0.05$, Table 4). There was no relationship found between being laid off and having a comorbidity ($p>0.05$, Table 4).

Those with CHD had significantly higher odds of being laid off than those without CHD (age, gender-adjusted OR=3.77, 95% CI: 1.19–11.69), and the odds remained higher after adjustment for age, gender, and occupational class (OR=3.64, 95% CI: 1.12–11.87) (Table 5).

Of CHD patients, 61% thought that their work had a negative effect on the course of their illness and 48.8% thought that their disease reduced their employment opportunities.

DISCUSSION

According to our study, the lay-off rate of CHD patients in one year was 24.4% and this was higher than that for participants who were not diagnosed with CHD when adjusted for possible confounders. It is known that CHD patients may experience mental problems such as depression, anxiety, and fear of death, and feel physically inadequate to work after myocardial infarction (MI) (13). In many studies, it has been found that a depressive mood, heart failure,

arrhythmia, and other chronic diseases or physical deficiencies reduced the possibility of a return to work after MI (12, 15–17). In our study, the people who had a history of angiography or angioplasty were more prone to be laid off. While examining CHD patients, mental status was found to be more important than physical status with regards to return to work (15). The decision to return to work generally depends upon the patient's own feelings (16).

According to many studies, it is known that the most important non-clinical factor associated with being laid-off is age and the chances of being laid off increases with age (15, 16, 18, 19). Although the lay-off rate supposedly increases with age, no significant relationship was observed in our study. In Turkey, in the past, the retirement pension has started earlier than in many other countries, so it was difficult to find workers older than 55 years of age. For this reason, our study population was limited to those between the ages of 30 and 55 due to early retirement. Thus, we may not have found a significant relationship between age and lay-offs due to the narrow age range of participants in our study.

It is known that people of low-social status are more likely to have cardiovascular disease and have lower return to work rates after illness (19). In our study, the lay-off rate was higher for low educated and blue-collar workers than others. The CHD patients employed in low-skilled manual occupations were at significant risk to lose their jobs compared to professional workers with the same diagnosis (20). The probability of CHD patients returning to work was reportedly highest among the highest educated and those with higher level occupations (21, 22). It was found that high educational level and high income favored continued employment in a population based study (22).

The lay-off rate of workers in the private sector was found to be significantly higher than those in the public sector in this study.

This situation can be attributed to the fact that job security in the public sector is higher than in the private sector (23, 24). Accordingly, it is stated that public sector employees have better health outcomes than those working in the private sector and this relationship is highly dependent on job (in) security (25). It is also known that there is less health inequality among the social classes of public employees (25). Moreover, it has been shown that job security is one of the reasons for increased motivation at work (26). At the same time, the presence of job security was a factor that supported the return to work after MI or by-pass surgery (27). In a qualitative study, some patients who were dissatisfied with their working conditions stated that their ability to withstand bad working conditions after a diagnosis of CHD decreased significantly and they were less likely to work (13). In accordance with this, the rate of return to work after MI is significantly higher in workers who were satisfied with their job (16, 28). While social support from colleagues and personal arrangements in the workplace were facilitators for returning to work after a CHD diagnosis, a lack of motivation and the negative effects of the job were found to be barriers (17). Support for CHD patients at work and in their social life is very important for these people to adapt to life after diagnosis.

It was found that a high level of social support after a CHD diagnosis has a positive effect on healthy life behaviors, coping with stressful situations, and treatment compliance (29). CHD patients with a low level of social support have returned to work significantly later than those with a high level of social support (18). It is thought that social circles in the family and workplace should be educated on the optimal interaction with CHD patients and this may encourage them to return to work (29).

This is the first study which evaluated the differences between public and private sector working conditions in conjunction with a CHD diagnosis. It is important that this research was a community-based cohort study. It shows the time relationship between lay-off and CHD diagnosis. In addition, the people did not have any systematic reasons for leaving work and there was no loss to follow up due to the retrospective design of the study.

Limitations of the Study

Those who had no phone number in the Manisa Public Health Directorate database were excluded from the study cohort at the beginning. These people may represent a disadvantaged group using health and social services which may result in selection bias. Therefore, the relationship between socioeconomic status and lay-off reported in other studies might not be determined in our study.

In accordance with the interviews conducted by the researchers, only 51 (10.8%) of 471 people with an I20-I25 diagnosis according to the ICD-10 code were confirmed to have a CHD diagnosed by a physician, while 420 people who were registered as having CHD according to the ICD-10 code did not confirm they had a CHD. It may be important to show that the diagnosis and coding system databases are largely inconsistent for use in epidemiological studies in Turkey. Due to the inability to reach people because of the premature death of those with poor general clinical status among CHD patients, their lay-off rate might be underestimated. There may also be a lack of memory and measurement or notification bias due to the retrospective interrogation regarding psychosocial risks at the last workplace. Face-to-face interviews were important to obtain reliable information from participants of different educational levels.

CONCLUSION

This study found that being laid off after having CHD is also dependent on whether one works in the public or private sector. It is important to understand that people of a low social class are more vulnerable to being laid off. Social security systems should understand and take these inequalities in work-life into consideration. Chronic illness and poor health conditions cause early exits from work-life. Young age and good mental status are the most important predictors for returning to work after a CHD diagnosis. To our knowledge, no prior study has investigated possible work conditions and employment status which may be related to CHD patient lay-off rates. People in the lower occupational class have higher lay-off rates, which may put CHD patients out of work and economically worse off. Working in the private sector may pose a significant risk for lay off. Our study showed comorbidity and physical workload requirements are not as important as expected with regards to being laid off. Social life and working conditions should be taken into consideration when evaluating the return to work of CHD patients. New regulations may be implemented to encourage CHD patients to remain in working, especially in the private sector. It should be noted that lay-off rates also depends on the socio-political situation of the labor force.

Informed Consent: Informed consent was obtained from the patients themselves.

Compliance with Ethical Standards: Dokuz Eylül University Ethical Committee has reviewed and approved the study protocol 2014/2205

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - CŞ, YD; Design - CŞ, YD; Supervision - CŞ, YD; Fundings - CŞ, YD; Materials - CŞ, YD; Data Collection and/or Processing - CŞ, YD; Analysis and/or Interpretation - CŞ, YD; Literature Search - CŞ, YD; Writing Manuscript - CŞ, YD; Critical Review - CŞ, YD

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