

COVID-19 infection rates among transportation and metal workers

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SUMMARY

OBJECTIVE: The aim of this study was to compare the workers in the metal and transportation sectors in terms of COVID-19 infection frequency and to examine and establish links between infection frequency and the workplace working conditions.

METHODS: A survey was prepared and conducted with a questionnaire prepared on the Google Form platform consisting of questions about the pandemic among the members of the All Transport Workers' and The United Metalworkers' Union in Turkey.

RESULTS: The number of workers diagnosed with COVID-19 was 5.8% in the transportation sector and 2.8% in the metal sector, with a significant difference ($p=0.036$). The percentage of workers diagnosed with COVID-19 who worked at a physical proximity less than 2 m in the transportation sector was higher than those who worked in the metal sector ($p=0.014$). The proportion of those who stated that there were COVID-19 patients among their colleagues and working at a physical proximity less than 2 m at the workplace was 18.2% in the transportation and 10.6% in the metal sector, with a significant difference ($p=0.003$), those who took time off from work was 74%, but 28.5% successively ($p<0.001$). The share of those who thought that the protective equipment and/or measures were not sufficient during the pandemic was 41.9% in the transportation and 17.7% in the metal sector ($p<0.001$).

CONCLUSION: The results emphasized that the characteristics of jobs, physical proximity during job hours, the use of protective equipment, and size of the workplaces should be considered as reasons for different infection risks in different sectors.

KEYWORDS: COVID-19. Infection. Metal workers. Transportation.

INTRODUCTION

The coronavirus disease 2019 (COVID-19) infection, which poses a high level of risk for some occupational groups such as the health care sector, also affects workers in other industrial branches where individuals have close contact with each other and share crowded and unprotected environments such as transportation services, lockers, restrooms, and cafeterias. Therefore, travel has been restricted to prevent the spread of COVID-19 infection in the world, and governments have taken measures such as social distancing, encouraging staying at home, education, and working from home¹.

Health care, security, retail, and cargo sectors include occupational groups that have provided uninterrupted service even during the pandemic. A study including six Asian countries showed that 15% of 690 COVID-19 infection cases were work related. Health care workers (22%), drivers

(18%), cleaners (9%), and security guards (7%) were the most frequently affected work-related disease groups². Of the 25 local spread cases reported from Singapore, 17 were work related, including tourism workers, sales and accommodation workers, transportation, and security personnel³. A literature review by Souza et al. showed that the highest COVID-19 prevalences were observed among farmers (20.76%) and retired persons (19.77%). Working in the service industry and health sector was seen in 7.19 and 4.34% of patients with COVID-19, respectively⁴.

Pouliakas and Branka used data from the Cedefop European skills and jobs survey and created a COVID-19 social distancing risk index (COV19R) based on skills descriptors that categorize jobs by their level of physical proximity to others and their digital intensity. Their analysis showed a lowest COV19R value among metal and machinery workers compared with other workers⁵.

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The aim of our study was to compare the workers working in the automotive supply industry and cargo workers in terms of the frequency of COVID-19 infection and to examine the links between the workplace, working conditions, and the frequency of COVID-19 infection.

METHODS

This research was conducted by conducting a survey created on the Google Form platform consisting of questions about the COVID-19 epidemic to the workers through unions and some social networks. In this context, the members of the United Metalworkers' Union organized in the metal sector, especially the automotive supply industry, and the members of the TUMTIS union organized in the transportation sector, especially cargo companies were determined as the target population. A total of 866 surveys were included in the evaluation. The survey was administered between June 2 and June 17, 2020. The surveys were analyzed using SPSS software package (version 24). The Pearson's chi-square test was applied to analyze whether the correlation between two variables was significant in categorical comparisons. The Fisher's exact chi-square test was applied if one or more of the cells had a value of 5 or less. In the case of p -value <0.05 , it was concluded that there was a significant difference between the two categories in terms of relevant variables.

RESULTS

Demographic characteristics of the sample population and chronic diseases, smoking, and alcohol consumption among them

The mean age of the metal workers who participated in the study was 36 years (SD: 8), and the mean age of the cargo workers was 38 years (SD: 8).

There was a significant difference between the two sectors in terms of gender distribution. The proportion of women was 14.6% in the transportation sector and 6.5% in the metal sector ($p<0.001$).

Moreover, the proportion of workers with chronic diseases was close to each other in the two sectors, with 14.7% in the transportation sector and 12.1% in the metal sector. The difference was not statistically significant.

There was a significant difference between the two sectors in terms of smoking, with the proportion of smokers 58.6% in the transportation sector and 50.1% in the metal sector ($p=0.041$).

COVID-19 infection characteristics of workers in the transportation and metal sectors

The proportion of workers diagnosed with COVID-19 was 5.8% in the transportation sector and 2.8% in the metal sector, showing a significant difference between the two sectors in terms of the diagnosis of COVID-19 ($p=0.036$).

Out of 356 workers in the transportation sector, 20 workers stated that they were diagnosed with COVID-19; and out of 433 workers in the metal sector, 12 workers stated that they have been diagnosed with COVID-19. Among the 20 workers with COVID-19 in the transportation sector, 11 out of 16, who stated their sectors, were working in cargo and courier-related jobs.

Table 1 shows the comparison of workers diagnosed with COVID-19 by sectors. Accordingly, there was no significant difference between the two sectors in terms of pharyngeal/nasal/swab testing. A similar case applies to the result of a positive test. There was no significant difference between the workers working in the two sectors in terms of the symptoms of the disease.

Table 1 shows whether there are other individuals with COVID-19 patients at home or at work among the workers diagnosed with COVID-19. There was no significant difference in those diagnosed with COVID-19 according to whether there is another household member diagnosed with COVID-19. In contrast, those who have COVID-19 cases among their colleagues who work at a physical proximity less than 2 m showed a statistically significant difference in terms of the two sectors (75% in the transportation sector vs. 20% in the metal sector, $p=0.014$).

The question "Is/was there anyone in the household with COVID-19?" was asked to all workers who responded to the survey, and no significant difference was found between the transportation and metal sectors. In contrast, there was a statistically significant difference between the workers who responded to the question "Is/was there any COVID-19 patients among your other colleagues who worked at a physical proximity less than 2 m to you at your workplace?" by their sectors. While the proportion of those who responded yes to this question was 18.2% in the transportation sector, it was 10.6% in the metal sector ($p=0.003$).

Moreover, there were significant differences in terms of taking time off from work in this period by sectors. Short-time working has been implemented at the workplaces, activities of which decreased immediately after the effects of the crisis in the metal sector. In contrast, the transportation sector became one of the critical sectors and continued to work. In fact, the proportion of those who stated that they took off from work in this period was 74% in the metal sector and 28.5% in the transportation sector ($p<0.001$). Furthermore, the proportion of workers at

Table 1. Positive test results and disease symptoms by sectors.

		Comparison of metal and transportation sectors				Fisher's exact test
		Transportation		Metal		Exact significance (two-sided)
		N	N%	N	N%	
Have you had pharyngeal/nasal/swab testing with the diagnosis of COVID-19?	No	4	20.0	3	25.0	1.000
	Yes	16	80.0	9	75.0	
Is the test positive or negative?	Negative	5	31.3	3	30.0	1.000
	Positive	11	68.8	7	70.0	
Cough	No	9	56.2	6	66.7	0.691
	Yes	7	43.8	3	33.3	
Shortness of breath	No	14	73.7	10	83.3	0.676
	Yes	5	26.3	2	16.7	
High fever	No	12	63.2	11	91.7	0.108
	Yes	7	36.8	1	8.3	
Arthralgia	No	14	87.5	8	88.9	1.000
	Yes	2	12.5	1	11.1	
Loss of taste and smell	No	14	87.5	8	88.9	1.000
	Yes	2	12.5	1	11.1	
Fatigue	No	15	93.8	9	100.0	1.000
	Yes	1	6.3	0	0.0	
No complaint	No	13	81.3	6	66.7	0.630
	Yes	3	18.8	3	33.3	
Unresponded	No	16	84.2	9	75.0	0.653
	Yes	3	15.8	3	25.0	
Was there any other COVID-19 patient at home at the time of diagnosis?	No	15	93.8	6	66.7	0.116
	Yes	1	6.3	3	33.3	
Are/were there any COVID-19 patients among your colleagues working away from you at your workplace?	Yes	11	78.6	5	55.6	0.363
	No	3	21.4	4	44.4	
Were there any COVID-19 patients among your other colleagues who worked at a physical proximity less than 2 m to you in your workplace?	Yes	12	75.0	2	20.0	0.014
	No	4	25.0	8	80.0	

the time of the survey was 91.9% in the transportation sector and 70.9% in the metal sector ($p < 0.001$). The proportion of those who stated that they benefited from short-time work was 6.1% in the transportation sector and 45.2% in the metal sector.

Regarding all of the workers from two sectors diagnosed with COVID-19, 36.36% had COVID-19 patients at home. In contrast, this rate was 2.6% in those who did not have the disease ($p < 0.001$).

The proportion of individuals diagnosed with COVID-19 who worked with another worker with COVID-19 diagnosis at

a physical proximity less than 2 m at the workplace was 53.9%, with a significant result ($p < 0.001$), while it was found to be 12.8% among those who were not diagnosed with COVID-19.

Within the scope of the study, it was questioned whether the measures taken against COVID-19 at the workplaces made a significant sectoral difference. Accordingly, there was no significant difference between the two sectors in terms of the question of whether employers took measures ($p = 0.101$). The proportion of those who thought that the protective equipment and/or measures were not sufficient during the pandemic was

41.9% in the transportation sector and 17.7% in the metal sector. The difference was statistically significant ($p < 0.001$).

There were significant differences between the transportation and the metal sectors in terms of providing protective equipment and taking measures, except for masks (Table 2). The proportion of workers stating that other than protective equipment, measures such as “marking for social distance,” “reducing the number of workers in the personnel shuttle,” and “adjusting the seating in the cafeteria” were taken at the workplace was higher than those in the metal sector. In contrast, gloves and face shields were provided to the workers in the transport sector at a higher rate.

DISCUSSION

Our study comparing the frequency of COVID-19 infection, workplace conditions, and disease characteristics of patients among metal workers and cargo and transportation workers is the first to compare the moderate-low risk group of metal sector and the high-risk group of cargo and transportation

sector in terms of COVID-19 infection. In the study, the rate of infection in cargo and transportation sector workers (5.8%) was twice as high as in the metal sector (2.8%), especially in the automotive industry. It was observed that workers in the transportation and cargo sector reported a higher proportion of patients with COVID-19 among their colleagues working at a close vicinity than those in the metal sector (18.3% vs. 10.6%). The proportion of those who thought that the protective equipment and/or measures taken were not sufficient during the pandemic was significantly higher in the transportation and cargo sector than in the metal sector (41.9 vs. 17.7%).

Of more than 130,000 workers working in meat and poultry processing facilities in the United States (in 19 states), the proportion of those who were infected with the disease during the pandemic was 3%, with a mortality rate of 0.04%. Conditions that pose risks for workers in the sector during the pandemic were listed. It was observed that a safe distance could not be provided between the workers during breaks and working hours, with problems in wearing masks and adhering to

Table 2. Provision of protective equipment among metal and transportation workers.

		Comparison of metal and transportation sectors				Chi-square tests
		Transportation		Metal		
		N	N%	N	N%	Asymptotic significance (two-sided)
Did the employer take any measure against COVID-19 (including providing protective equipment to you) during this period?	No	37	10.90	32	7.50	0.101
	Yes	303	89.10	396	92.50	
Do you think that the protective equipment and/or measures taken during the pandemic were sufficient?	No	143	41.90	75	17.70	<0.001
	Partially	67	19.60	163	38.40	
	Yes	131	38.40	186	43.90	
Mask	No	16	4.60	28	6.50	0.268
	Yes	330	95.40	405	93.50	
Gloves	No	66	19.10	184	42.50	<0.001
	Yes	280	80.90	249	57.50	
Face shield	No	168	48.60	286	66.10	<0.001
	Yes	178	51.40	147	33.90	
Apron	No	333	96.20	397	91.70	0.009
	Yes	13	3.80	36	8.30	
Disinfectant	No	81	23.40	64	14.80	0.002
	Yes	265	76.60	369	85.20	
Marking for social distancing	No	217	62.70	151	34.90	<0.001
	Yes	129	37.30	282	65.10	
Reducing the number of workers in the personnel shuttle	No	191	55.20	101	23.30	<0.001
	Yes	155	44.80	332	76.70	
Arranging the seating in the cafeteria	No	251	72.50	78	18.00	<0.001
	Yes	95	27.50	355	82.0	

disinfection rules. The measures to be taken were reported as ensuring the safe distance among the workers, increasing the number of shuttles, and increasing education⁶. In our study, the level of measures including the use of disinfectants (85.2 vs. 76.6%), marking for social distance (65.1 vs. 37.3%), reducing the number of workers in the shuttle (76.7 vs. 44.8%), and adjusting the seating in the cafeteria (82 vs. 27.5%) was significantly higher in the metal sector compared to the cargo and transportation companies. The rate of reporting the provision of an adequate number of masks was between 93 and 95% in both sectors. The provision of gloves (80.9 vs. 57.5%) and face shields (51.4 vs. 33.9%) was found to be higher in the cargo and transportation sector than in the metal sector. Unlike the study conducted in the United States, our study revealed the measures taken in different areas of the workplace in more detail since it used the data obtained from the workers via surveys. Our study was conducted 4 months after the onset of the pandemic and shows that the measures were taken more effectively in the metal sector. According to the results of the study, whether or not to take off from work was one of the issues that produced a significant difference for the two sectors. While the metal sector is a business line where short-time work is implemented intensively due to the decrease in production, it is not possible to mention a decrease in the activities of the transportation sector. This may be one of the sources of the difference between the two sectors.

It is seen that there is a remarkable difference in terms of workplace scale size and unionization rates for both sectors.

The metal sector has a unionization rate of 3.6 points (17.4%), which is above the Turkish average of 13.8%. In contrast, the rate of organization in the transportation sector is 10.5%, which is below the Turkish average^{7,8}.

It can be speculated that variables such as sectoral differences, the nature of the work, the level of institutionalization of the workplaces, and the capacity of workers to act in an organized manner affect the spread rate of COVID-19 at workplaces. However, it is obvious that workplaces do provide suitable environments for the spread of the virus no matter how effective are the measures taken at the workplaces.

CONCLUSION

This study attempted to address the risks faced by workers in two sectors with different qualitative characteristics in terms of COVID-19 in the early stage of the pandemic through the measures taken in the workplace and the nature of the work. The results of this study will make a significant contribution to the literature and future studies in terms of the correlation of the epidemic with the working environment.

AUTHORS' CONTRIBUTIONS

FSÖ: Conceptualization, Data curation, Formal Analysis, Writing – original draft. **NG:** Conceptualization, Data curation. **GEG:** Formal Analysis, Writing – review & editing. **PA:** Conceptualization, Writing – review & editing.

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