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SOCIOECONOMIC DETERMINANTS OF OCCUPATIONAL ACCIDENTS IN OECD COUNTRIES

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Socioeconomic Determinants of Occupational Accidents in OECD Countries

Esra YALÇIN[1]

Abstract

Occupational accidents constitute a significant health, economic burden around the world and a range of factors determine the frequency of accidents. This study aims to investigate the relationship between socioeconomic factors and occupational accident rates. The study was based on annual panel-structured data obtained from 22 OECD countries covering the 2014-2023 period. Fatal and non-fatal occupational accident rates were used as dependent variables. The explanatory variables included GDP per capita, unemployment rate, average annual working hours, and public social protection (SOCX). Pearson correlation analysis, multicollinearity diagnostics, and regression analyses with country-level dummy variables were performed to evaluate the associations between socioeconomic indicators and occupational accident rates. The findings demonstrated that unemployment rate was positively and significantly associated with non-fatal occupational accident rates in the country-controlled regression model (B = 31.04, p = .041). For fatal occupational accidents, GDP per capita demonstrated a significant negative association (B = -2.93e−5, p = .003), whereas average annual working hours showed a significant positive association (B = 0.00359, p = .008). Significant cross-country differences in occupational accident rates were also identified within the OECD sample. The findings indicate that fatal and non-fatal occupational accidents are associated with different socioeconomic dynamics across OECD countries. While labor market instability was more strongly associated with non-fatal occupational accidents, prolonged working exposure was associated with fatal occupational accident risks. The results also suggest that country-specific structural characteristics play an important role in occupational accident outcomes, highlighting the importance of integrated occupational safety, labor market, and social protection policies.

Keywords: social policy; occupational health and safety; OECD country; occupational accidents; fatal accidents; non-fatal accidents.

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Introduction

Workplace safety remains a global concern despite increasing efforts of advocates, employers, safety professionals, regulators, unions (Wiengarten *et al.*, 2025). According to the (United Nations Global Compact, 2022), approximately 2.78 million workers die each year due to occupational accidents and work-related diseases, while 374 million workers suffer from non-fatal occupational accidents. Beyond these alarming figures, the human and social consequences for workers and their families are profound and often difficult to fully quantify. In addition to this immeasurable human suffering, occupational accidents and diseases impose a substantial economic burden on organizations and societies (Jilcha & Kitaw, 2017). Accordingly, the International Labor Organization (ILO) estimates that the economic burden associated with inadequate investment in occupational safety and health (OSH) resulting in preventable occupational accidents and diseases accounts for approximately 4% of the Global Gross Domestic Product (GDP) annually, equivalent to nearly 2.8 trillion US dollars (ILO, 2015).

At the organizational level, occupational injuries and illnesses generate both direct and indirect costs (Lin, 2025). These include compensation expenses, productivity losses, reduced work capacity, and operational disruptions (Jilcha & Kitaw, 2017). Moreover, occupational accidents and diseases can affect a major impact on productivity, competitiveness and reputation of enterprises. The overall costs, taking into account the human and financial components, can by far exceed the compensation costs (including indemnities and medical costs) (Boileau, 2016) This situation indicates that workplace accidents will have significant financial consequences. The compensation costs associated with these accidents create the costs faced by employees, production disruptions, loss of reputation, and decreased profitability (Madwe & Nzuza, 2026).

Traditional approaches generally attribute occupational accidents to unsafe conditions (Baldissone *et al.*, 2019; Fargnoli & Lombardi, 2019; Nkem *et al.*, 2015) or unsafe behaviour (Chen *et al.*, 2019; Li *et al.*, 2020; Liao *et al.*, 2016; Wu *et al.*, 2018). In contrast, contemporary research increasingly emphasizes the economic and social factors determinants that shape the working environment. The relationship between economic cycle and occupational accidents was first examined by (Kossoris, 1938) in the manufacturing industry. The study suggested that economic growth and heightened production demand correlate with increased occupational accidents due to intensified workloads, accelerated work paces, and the recruitment of unskilled labor. Subsequently, many studies confirmed the relationship between economic factors and occupational accidents. For instance, occupational injuries tend to increase during periods of economic expansion and decline during economic recessions, particularly in sectors such as construction where employment and production activities fluctuate significantly (Dong *et al.*, 2013). During economic expansions, a higher share of inexperienced workers and greater reporting willingness increase workplace accidents, while the opposite

occurs during recessions, leading to lower reported injury rates (Asfaw *et al.*, 2011). Similarly, (Fabiano *et al.*, 1995; Gutiérrez-Falcón, 2025) suggests a direct effect of economic growth on the incidence of occupational accidents. Previous studies also indicate that occupational accidents have long-term economic consequences, including reductions in employment and earnings after accidents, suggesting substantial labour market impacts (Parro & Pohl, 2021)

There is considerable worldwide concern over the potential impact of prolonged work hours on workplace health and safety (Folkard & Lombardi, 2006) The temporal organization of work has emerged as a pivotal macro-determinant in the field of occupational health and safety. Workplace safety is not limited to these accidents caused due to lapses in safety measures, include factors such as working conditions and working hours (Awasthy & Hazra, 2019). The research highlights that extended working hours coupled with insufficient rest periods significantly elevate the probability of workplace accidents (Dembe *et al.*, 2005; Salminen, 2016; Wagstaff & Lie, 2011) Specifically, working hour patterns characterized by long work shifts (exceeding 12 hours) and quick returns defined as less than 11 hours of rest between shifts have been shown to significantly elevate the relative risk of occupational accidents (Ropponen *et al.*, 2023).

This study aims to provide a comparative cross-country analysis of occupational accidents across OECD countries by examining the relationship between socioeconomic indicators and occupational accident rates. The study focuses on 22 OECD countries during the 2014-2023 period and evaluates how macroeconomic conditions, labor market dynamics, and social protection expenditures are associated with fatal and non-fatal occupational accident outcomes. In addition to economic growth indicators, the study incorporates unemployment rate, average annual working hours, and public social protection expenditure (SOCX) into the analytical framework in order to evaluate the potential role of labor market conditions and welfare systems in occupational safety outcomes. In this respect, the study contributes to the occupational health and safety literature by providing cross-country evidence on the socioeconomic determinants of occupational accidents within OECD countries.

Accordingly, the study addresses the following research questions:

RQ1. To what extent are GDP per capita, unemployment rate, average annual working hours, and social protection expenditures associated with occupational accident rates across OECD countries?

RQ2. Do the relationships between socioeconomic indicators and occupational accident rates differ between fatal and non-fatal occupational accidents?

To answer these questions, regression analyses with country-level control variables were conducted using annual data from 22 OECD countries covering the 2014-2023 period. The remainder of the article is organized as follows. Section 2 explains the materials and methods, including data sources, variable selection,

and model specification. Section 3 presents the empirical findings, while Section 4 discusses the results within the context of the occupational health and safety literature. Finally, Section 5 concludes the study by outlining its limitations and providing directions for future research on macro-level determinants of occupational accidents.

Methodology

Research Sample and Data Sources

This study uses data from 22 member countries of the Organisation for Economic Co-operation and Development (OECD) covering the 2014-2023 period to examine the relationship between socioeconomic conditions and occupational accident rates. The sample includes Austria, Belgium, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, and Türkiye. These countries were selected due to the availability of consistent data across all study variables. Since only six countries had available data for 2024, the analysis period was limited to 2014-2023. In this study, annual statistics on fatal and non-fatal occupational injury rates per 100,000 workers were obtained from the ILOSTAT Data Explorer compiled by the International Labour Organization (ILOSTAT, 2026).

Description of Variables and Dimensions

To capture the multi-dimensional nature of the socioeconomic determinants affecting occupational safety, the explanatory variables are categorized into four distinct dimensions, measured with harmonized international data:

Table 1. Description of Variables and Socioeconomic Dimensions

Dimension	Explanatory Variable	Proxy / Indicator & Unit	Data Source
Economic development	GDP per capita	Gross Domestic Product per capita (current US$)	(World Bank Group Data, n.d.)
Labor market pressure	Unemployment rate	Total unemployment as a percentage of the labor force (%)	(OECD Data, 2026a)
Working intensity	Average hours worked	Average annual hours worked per person (hours/year)	(OECD Data, 2026b)

Institutional capacity	Social protection expenditure	Public social expenditure as a percentage of GDP (%)	(OECD Data, 2026c)

As detailed in Table 1, these explanatory variables are systematically utilized to evaluate their impact on occupational safety outcomes. GDP per capita was included as a proxy for economic development and overall economic activity. Furthermore, the unemployment rate reflects prevailing labor market conditions, while average annual working hours are incorporated to capture labor intensity and potential fatigue-related occupational risks. Lastly, social protection expenditure (% of GDP) was utilized to evaluate institutional and social protection context associated with occupational health and safety.

To ensure cross-country comparability, occupational accident statistics were collected from internationally standardized labor and occupational safety datasets. Although OECD, World Bank, and ILO databases apply standardized reporting procedures, certain cross-national differences may remain regarding national accident reporting systems, coverage criteria, and institutional definitions of occupational injuries. Nevertheless, the utilization of harmonized international datasets substantially improves the comparability and reliability of this panel-based cross-country analysis.

Descriptive Statistics

Descriptive statistics were calculated to provide a comprehensive overview of the dataset. Table 2 presents the mean, standard deviation (SD), minimum, and maximum values for all dependent and independent variables across the 22 OECD countries over the 10-year period (2014-2023).

Table 2. Descriptive Statistics of the Variables

Variable	Timespan	Definition (Measurement Unit)	Mean ± SD	Minimum	Maximum
Fatal Accident Rate	2014–2023	Fatal occupational injuries per 100,000 workers	2.04 ± 1.54	0.10	9.40
Non-Fatal Accident Rate	2014–2023	Non-fatal occupational injuries per 100,000 workers	1526.00 ± 947.00	95.90	5200.00

GDP per capita	2014–2023	Gross Domestic Product per capita (current US$)	42576.00 ± 26925.00	8798.00	134966.00
Unemployment Rate	2014–2023	Total unemployment as a percentage of the labor force (%)	7.45 ± 4.37	2.00	26.70
Average Annual Hours Worked	2014–2023	Average annual hours worked per person (hours/ year)	1598.00 ± 150.00	1314.00	1961.00
Social Protection Exp.	2014–2023	Public social expenditure as a percentage of GDP (SOCX, %)	23.50 ± 5.35	8.40	34.70

Model Specification

To examine the relationship between socioeconomic indicators and occupational accident rates, regression analyses were conducted using annual panel-structured data from 22 OECD countries covering the 2014–2023 period. The analyses focused on the effects of GDP per capita, unemployment rate, average annual working hours, and public social expenditure (SOCX) on fatal and non-fatal occupational accident rates.

Prior to the regression analyses, Pearson correlation analysis was performed to evaluate the direction and strength of the relationships among the study variables. In addition, multicollinearity among the explanatory variables was assessed using Variance Inflation Factor (VIF) and tolerance statistics. The VIF values indicated no serious multicollinearity problem among the independent variables.

Regression models were estimated using fatal and non-fatal occupational accident rates as dependent variables and socioeconomic indicators as explanatory variables. To account for cross-country differences within the panel structure, country-level dummy variables were incorporated into the regression models, with Austria designated as the reference category.

The regression outputs included regression coefficients (B), standard errors (SE), t-statistics, p-values, and model fit statistics (R and R^2). All statistical analyses were conducted using Microsoft Excel 365 and Jamovi statistical software (Version 2.6.44), and statistical significance was evaluated at the 95% confidence level ($p < 0.05$).

Results

Cross-Country Distribution of Fatal and Non-Fatal Occupational Accident Rates

Figure 1. demonstrates the distribution of average fatal occupational accident rates across OECD countries during the 2014-2023 period. Türkiye and France exhibited the highest average fatal occupational accident rates, whereas the Netherlands and Sweden demonstrated the lowest rates among the analyzed countries.

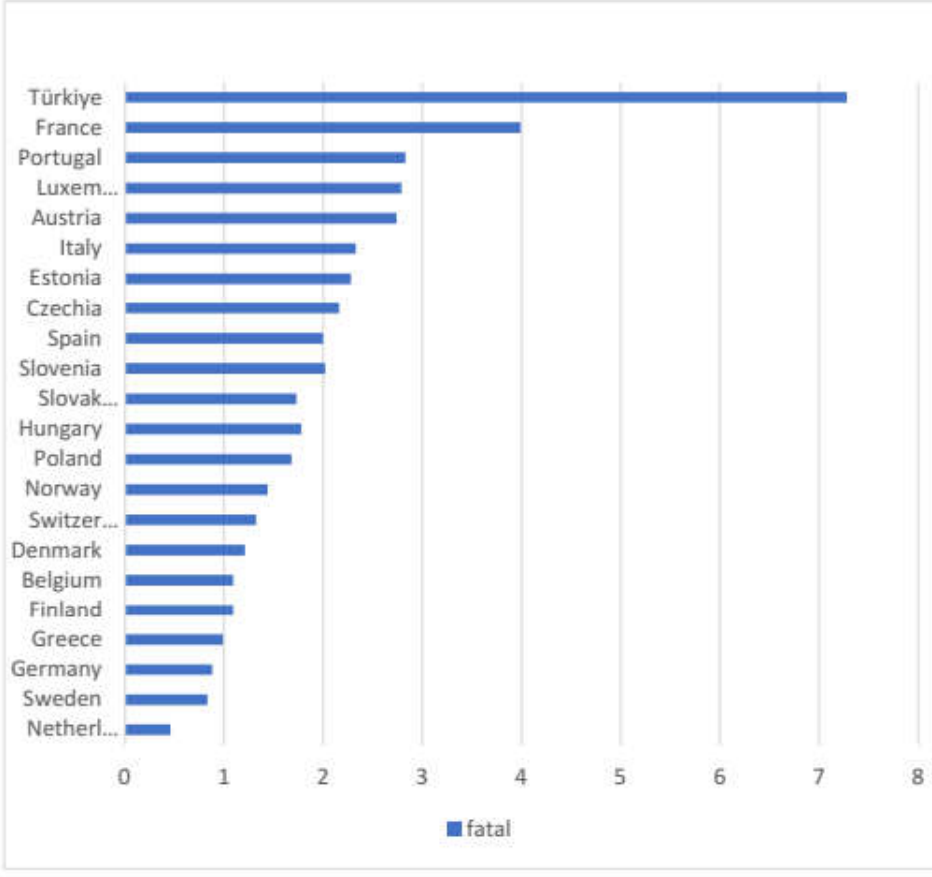

Figure 1. Average Fatal Occupational Accident Rates Across 22 OECD Countries (2014-2023)

Figure 2. presents the distribution of average non-fatal occupational accident rates across OECD countries for the same period. France and Portugal exhibited the highest average non-fatal occupational accident rates, while Greece and Norway demonstrated the lowest rates within the OECD sample.

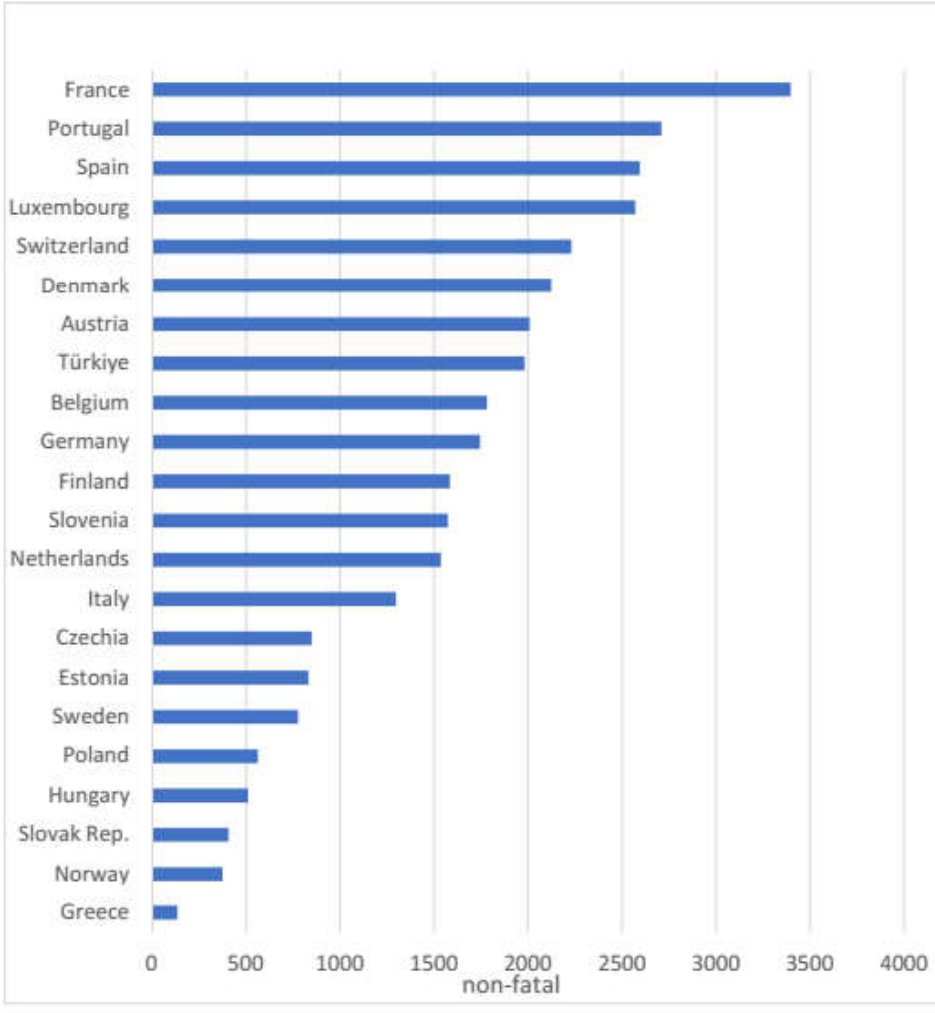

Figure 2. Average Non-Fatal Occupational Accident Rates Across 22 OECD Countries (2014-2023)

Correlation Analysis

To evaluate the strength and direction of the linear relationships among the study variables, a Pearson correlation analysis was conducted prior to the panel regression analysis. Table 3 presents the correlation coefficients (r) and corresponding significance levels (p-values) for all dependent and independent variables.

Table 3. Pearson Correlation Matrix

Variables	fatal	nonfatal	GDP	unemployment	hours	SOCX
fatal	-					
nonfatal	0.326***	-				
GDP	-0.249***	0.272***	-			
unemployment	0.193**	0.074	-0.334***	-		
hours	0.267***	-0.330***	-0.678***	0.453***	-	
SOCX	-0.312***	0.223***	0.143*	0.110	-0.405***	-

*Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$ (two-tailed).*

As shown in Table 3, fatal occupational accident rates were positively correlated with unemployment and average annual working hours, whereas negative correlations were observed with GDP per capita and social protection expenditure. In contrast, non-fatal occupational accident rates demonstrated positive correlations with GDP per capita and social protection expenditure, while annual working hours showed a negative correlation with non-fatal occupational accidents. No statistically significant relationship was identified between unemployment and non-fatal occupational accident rates. Among the explanatory variables, GDP per capita showed a strong negative correlation with average annual working hours and a moderate negative correlation with unemployment. In addition, annual working hours were positively associated with unemployment and negatively associated with social protection expenditure.

Regression Analysis for Non-Fatal Occupational Accidents

As shown in Table 4, all VIF values remained below the conservative threshold of 5.0, indicating no substantial multicollinearity among the explanatory variables.

Table 4. Multicollinearity Diagnostics

Variable	VIF	Tolerance
GDP per capita	1.93	0.519
Unemployment Rate	1.45	0.691
Average Hours Worked	2.82	0.355
Social Protection Exp. (SOCX)	1.43	0.700

Following the diagnostic analysis, regression analysis was conducted for non-fatal occupational accident rates. Table 5 presents the initial regression model without country-level controls. In this model, unemployment rate demonstrated a statistically significant positive association with non-fatal occupational accident rates, whereas average annual working hours showed a significant negative association. GDP per capita and social protection expenditure did not exhibit statistically significant effects.

Table 5. Panel Regression Coefficients (Dependent Variable: Non-Fatal Accident Rate)

Predictor	Estimate (*B*)	Standard Error (SE)	t-statistic	p-value
Intercept	4526.72320	1263.91411	3.582	< 0.001***
GDP per capita	0.00385	0.00302	1.277	0.203
Unemployment Rate	59.65373	16.12191	3.700	< 0.001***
Average Hours Worked	-2.33074	0.65433	-3.562	< 0.001***
Social Protection Exp. (SOCX)	4.89296	13.09214	0.374	0.709

Note: *** $p < 0.001$.

To account for cross-country heterogeneity, country-level dummy variables were subsequently incorporated into the regression model, with Austria designated as the reference category. The country-controlled model explained 84.8% of the variance in non-fatal occupational accident rates ($R = .921$, $R^2 = .848$, $N = 220$). As presented in Table 6, unemployment rate remained positively associated with

non-fatal occupational accidents, whereas GDP per capita and average annual working hours did not demonstrate statistically significant effects after controlling for country-specific differences. Social protection expenditure showed a negative but marginally non-significant association with non-fatal occupational accident rates.

Table 6. Linear Regression Coefficients for Non-Fatal Occupational Accidents

Predictor	Estimate (B)	(SE)	(t)	(p)
Intercept[a]	4645.17	1871.81	2.48	.014
GDP	-0.002	0.006	-0.37	.715
unemployment	31.04	15.11	2.05	.041
hours	-0.93	0.85	-1.09	.277
SOCX	-45.30	24.55	-1.85	.067
Country (vs. Austria)				
Belgium	-206.32	187.50	-1.10	.273
Czechia	-1293.14	328.71	-3.93	**<.001**
Denmark	24.88	200.15	0.12	.901
Estonia	-1576.63	346.43	-4.55	**<.001**
Finland	-368.92	186.73	-1.98	**.050**
France	1386.77	190.18	7.29	**<.001**
Germany	-420.44	223.44	-1.88	.061
Greece	-2137.54	356.86	-5.99	**<.001**
Hungary	-1784.31	357.26	-4.99	**<.001**
Italy	-753.98	227.56	-3.31	**.001**
Luxembourg	358.57	448.36	0.80	.425
Netherlands	-968.57	323.55	-2.99	**.003**
Norway	-1809.69	279.93	-6.47	**<.001**
Poland	-1553.24	352.55	-4.41	**<.001**
Portugal	513.13	275.15	1.87	.064
Slovak Rep.	-2076.34	355.55	-5.84	**<.001**
Slovenia	-660.98	270.05	-2.45	**.015**

Spain	192.97	258.51	0.75	.456
Sweden	-1416.63	195.14	-7.26	**<.001**
Switzerland	-187.76	366.17	-0.51	.609
Türkiye	-845.48	491.24	-1.72	.087

Note. Significant values (p ≤.05) are bolded for clarity.[a] Represents reference level (Austria).

Regarding country-level differences, France exhibited significantly higher non-fatal occupational accident rates relative to Austria, whereas several countries, including Czechia, Estonia, Greece, Hungary, Poland, and Sweden, demonstrated significantly lower accident rates compared with the reference country.

Regression Analysis for Fatal Occupational Accidents

Following the regression analysis, fatal occupational accident rates were evaluated in relation to GDP per capita, unemployment rate, average annual working hours, and public social expenditure (SOCX). The results of the regression model are presented in Table 7.

Table 7. Panel Regression Coefficients (Dependent Variable: Fatal Accident Rate)

Predictor	Estimate (*B*)	Standard Error (SE)	t-statistic	p-value
Intercept	6.08035	2.05879	2.95	0.003**
GDP per capita	-0.00001	0.000005	-2.32	0.021*
Unemployment Rate	0.07490	0.02626	2.85	0.005**
Average Hours Worked	-0.00109	0.00107	-1.02	0.307
Social Protection Exp. (SOCX)	-0.10076	0.02133	-4.72	<.001***

*Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.*

In the regression model, GDP per capita demonstrated a statistically significant negative association with fatal occupational accident rates, whereas unemployment rate showed a statistically significant positive association. Public social expenditure (SOCX) was also negatively associated with fatal occupational accidents. In contrast, average annual working hours did not demonstrate a statistically significant relationship with fatal occupational accident rates.

To account for cross-country heterogeneity within the dataset, country-level dummy variables were incorporated into the regression model. The results of the country-controlled regression model are presented in Table 8. After controlling for

country-specific differences, GDP per capita remained significantly and negatively associated with fatal occupational accident rates. However, unemployment rate and public social expenditure no longer demonstrated statistically significant effects within the model.

Table 8. Linear Regression Coefficients for Fatal Occupational Accidents

Predictor	Estimate (B)	SE	(t)	(p)
Intercept[a]	-0.79339	2.93883	-0.270	0.787
GDP	-2.93e−5	9.58e-6	-3.062	**0.003**
unemployment	0.00670	0.02373	0.282	0.778
hours	0.00359	0.00134	2.689	**0.008**
SOCX	-0.01162	0.03854	-0.301	0.763
Country (vs. Austria)				
Belgium	-2.08035	0.29438	-7.067	<.001
Czechia	-2.45293	0.51609	-4.753	**<.001**
Denmark	-0.88533	0.31425	-2.817	**0.005**
Estonia	-2.15225	0.54392	-3.957	**<.001**
Finland	-1.90485	0.29318	-6.497	<.001
France	0.95116	0.29859	3.185	**0.002**
Germany	-1.53632	0.35082	-4.379	**<.001**
Greece	-4.29506	0.56028	-7.666	**<.001**
Hungary	-2.91433	0.56091	-5.196	<.001
Italy	-1.59895	0.35728	-4.475	**<.001**
Luxembourg	1.93582	0.70394	2.750	**0.007**
Netherlands	-2.19446	0.50799	-4.320	**<.001**
Norway	-0.16372	0.43951	-0.373	0.710
Poland	-3.34341	0.55353	-6.040	**<.001**
Portugal	-1.65123	0.43200	-3.822	**<.001**
Slovak Rep.	-2.75957	0.55823	-4.943	**<.001**
Slovenia	-2.01369	0.42399	-4.749	<.001
Spain	-2.13057	0.40588	-5.249	**<.001**
Sweden	-1.73185	0.30639	-5.653	**<.001**
Switzerland	-0.70106	0.57491	-1.219	0.224
Türkiye	2.16531	0.77128	2.807	**0.006**

Note. Significant values (p ≤.05) are bolded for clarity.[a] Represents reference level (Austria).

Unlike the previous regression model, average annual working hours demonstrated a statistically significant positive association with fatal occupational accident rates after incorporating country-level controls ($B = 0.00359$, $p = .008$). These findings indicate that the relationship between working hours and fatal occupational accidents became more evident after accounting for cross-country structural differences.

Discussion

This study examined the relationship between socioeconomic indicators and occupational accident rates across 22 OECD countries during the 2014-2023 period. The findings demonstrated that fatal and non-fatal occupational accidents were associated with different socioeconomic indicators after controlling for cross-country differences. In the final country-controlled models, unemployment rate emerged as the main explanatory factor for non-fatal occupational accidents, whereas GDP per capita and average annual working hours were more strongly associated with fatal occupational accident rates. These findings suggest that different occupational accident outcomes may reflect different structural and labor-related mechanisms across OECD countries.

For non-fatal occupational accidents, unemployment rate demonstrated a positive and statistically significant association in the final regression model. This finding suggests that labor market instability and insecure employment conditions may contribute to increased occupational accident risks. Previous studies have also reported associations between labor market conditions and occupational injury patterns. For example, (Asfaw *et al.*, 2011) reported that changes in employment levels and labor demand may influence occupational injury incidence. Under unstable labor market conditions, workers may experience increased psychosocial pressure, job insecurity, reduced bargaining power, and greater exposure to unsafe working environments. Economic insecurity and fear of unemployment may also increase stress, anxiety, and psychological strain among workers, thereby negatively affecting occupational safety outcomes (Neumayer, 2004). The positive association between unemployment and non-fatal occupational accidents may also be interpreted within the framework of precarious and insecure employment conditions. Previous studies have suggested that labor insecurity, unstable employment structures, precarious employment conditions, and regulatory environments may negatively affect occupational health and safety outcomes and increase occupational injury risks (Koranyi *et al.*, 2018; Underhill & Quinlan, 2011).

The present findings differ from the results reported by (Boone & van Ours, 2006), who identified an inverse relationship between unemployment and occupational accident rates. These inconsistencies may be associated with differences in study periods, labor market structures, reporting systems, and statistical model specifications across countries. In addition, underreporting dynamics and variations in occupational injury surveillance systems among OECD countries may contribute to differences in observed occupational accident patterns. Previous studies have also suggested that non-fatal occupational accident statistics may be influenced by underreporting behaviors, particularly during periods of high unemployment and insecure employment conditions (Palali & van Ours, 2017).

Unlike non-fatal occupational accidents, fatal occupational accidents demonstrated a different socioeconomic pattern in the country-controlled regression model. GDP per capita remained negatively associated with fatal occupational accident rates, suggesting that economically stronger countries may benefit from better occupational safety infrastructure, technological capacity, regulatory enforcement, and preventive safety investments. Previous studies have similarly reported that economic development may contribute to improvements in workplace safety systems and reductions in fatal workplace incidents (Kahraman *et al.*, 2019; Palaz & Çolak, 2017). For example, research conducted in high-risk industries in China demonstrated that increases in GDP were associated with decreases in fatal occupational accidents, highlighting the potential role of technological advancement, preventive safety systems, and regulatory capacity in improving occupational safety outcomes (Cao *et al.*, 2025).

Regarding fatal occupational accidents, average annual working hours demonstrated a statistically significant positive association after controlling for country-level differences. This finding suggests that prolonged working exposure may increase the risk of severe or fatal occupational injuries. Long working hours have been associated with cumulative fatigue, reduced concentration, impaired decision-making, physical exhaustion, and increased exposure duration in occupational environments. Previous studies have similarly demonstrated that overtime schedules and extended working hours are associated with significantly increased occupational injury risks, with injury rates increasing progressively as daily and weekly working hours rise (Dembe *et al.*, 2005; Palaz & Çolak, 2017; Ropponen *et al.*, 2023; Salminen, 2016).

Another important finding of the study was the effect of country-level structural differences on occupational accident outcomes. After incorporating country-level controls into the regression models, the significance levels of several socioeconomic variables changed considerably. This finding suggests that occupational accident rates across OECD countries may be influenced not only by macroeconomic indicators but also by country-specific institutional and structural factors, including welfare systems, labor market structures, occupational safety regulations, reporting practices, and workplace safety cultures (Underhill & Quinlan, 2011).

Conclusion

This study examined the relationship between socioeconomic indicators and occupational accident rates across 22 OECD countries during the 2014-2023 period. The findings demonstrated that unemployment rate was positively associated with non-fatal occupational accident rates, whereas GDP per capita was negatively associated with fatal occupational accident rates after controlling for country-level differences. In addition, average annual working hours demonstrated a positive relationship with fatal occupational accidents, suggesting that prolonged working exposure may contribute to severe occupational injury risks.

Another important finding of the study was that the significance and magnitude of several socioeconomic indicators changed after country-level controls were incorporated into the regression models. This result suggests that occupational accident rates are shaped not only by macroeconomic conditions but also by institutional and structural differences across countries, including labor market characteristics, occupational safety regulations, reporting systems, and workplace safety practices.

Several limitations should also be considered when interpreting the findings of this study. First, occupational accident statistics may differ across OECD countries due to variations in reporting systems and national occupational injury definitions. Second, the analyses were conducted using macro-level indicators and did not include sector-specific or occupation-specific variables. Third, the study focused on associations between variables and does not establish direct causal relationships.

Despite these limitations, the study provides a comparative cross-country perspective on the socioeconomic determinants of occupational accidents within OECD countries. Overall, the findings indicate that occupational accidents should be evaluated not only as workplace-level safety problems but also as outcomes associated with broader socioeconomic and structural conditions. In this respect, improving occupational safety performance may require integrated policies addressing employment conditions, working time arrangements, social protection systems, and preventive occupational safety strategies simultaneously.

Future studies may contribute to the literature by incorporating sector-specific variables, institutional indicators, and longitudinal policy changes into comparative occupational safety analyses. In addition, further research examining reporting differences and causal mechanisms across countries may provide a more comprehensive understanding of the socioeconomic determinants of occupational accidents.

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