

Epidemiological Characteristics of Occupational Accidents Reported to the National Center for Occupational Safety and Health for the years 2011-2013

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Summary:

Background: Understanding the risk factors associated with injuries at workplace is an essential element to design and implement preventive measures for such injuries which are a significant source of disability, death and socioeconomic losses worldwide.

Objectives: describe cases of occupational injuries with respect to person- place- time model.

Materials and methods: Cross-sectional study done from October 2013 to October 2014 carried on 467 records of occupational injuries kept in the National Center for Occupational Safety and Health for the years 2011-2013.

Results: A higher proportion of reported occupational accidents occurred in young male workers, during day time and among primary school graduates. The leading cause of fatality/permanent disability was electrical shock. Work-related road accidents had the highest fatality/permanent disability rate. Missing data in the field: age, duration of service, length of sick leave constituted 22.5%, 43% and 69.4% respectively.

Conclusion: Work accidents could be prevented through the application and the use of safety techniques and equipments. Improving the quality and the completeness of data on occupational injuries is an important step to promote the performance of occupational health services.

Keywords: injured workers; occupational injuries; Iraq.

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Introduction:

Occupational injuries are a significant public health problem (1), they have severe consequences for workers and society (disabilities, lost working time, medical care, etc.) (2). The World Health Organization (WHO) defines the work-related injury as an epidemic problem in the field of public health in developing countries (3). According to the ILO, 1 of 10 workers is involved in the injuries annually and 5% of national labor days are lost (3). The human cost of this daily adversity is vast and the economic burden of poor occupational safety and health practices is estimated at 4 percent of global Gross Domestic Product each year (4).

The severe consequences of the occupational injuries pointed out the importance of epidemiological knowledge for determining appropriate preventive measures (2). According to the report prepared by the ILO on safety culture, all occupational diseases and 98% of occupational accidents are avoidable (5). Accidents and diseases related to working environment have two common characteristics as being primarily man-made and can be prevented to a large extent (6).

Developing countries do not have reliable epidemiological data regarding occupational injuries due to the lack of proper recording and notification system (7). However, Iraq had an estimated count of occupational fatalities of 532 and the total number of non-fatal accidents was around 500,000 (8).

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Objective of the study: Assess the degree of disability as an outcome of the reported occupational injuries. Study the association between selected social demographic variables, causes of occupational accidents and the outcome of the accidents.

Material and methods:

This is a cross-sectional study done from October 2013 to October 2014 that included (467) records of occupational injuries available at the National Center for Occupational Safety and Health. It was designed to assess the epidemiological characteristics of the occupational injuries which were reported to the center for the years 2011-2013 and the accuracy and completeness of the paper based records. A review of case record was done. Requested information was demographic data (age, sex, education); occupational data (duration of work in service, industrial sector) and information on accident (time of injury, month of occurrence of injury). For comparison purpose, we used death/permanent disability as an outcome for severe injuries due to their irreversibility and serious impact on workers and society.

Statistical analysis: By using statistical package for social sciences version 21, IBM. Data were entered and analyzed. Descriptive statistics were presented as frequency distribution and percentage calculation was made for most of the variables. Cross tabulation was tested for statistical significance using chi-square. P-value less than 0.05 is considered statistically significant.

Results:

Among a total of 467 records of workplace injuries reported to the National Center for Occupational Safety and Health during the years 2011-2013, (12.6%) ended with death/permanent disability (as an outcome). Fatality/permanent disability rate by selected independent variables was measured as shown in table 1, the highest rate was observed in age group under 30 years, in which death was the end result in 14.1% of a total number of 92 study sample, which was slightly higher than that of the age groups 30-39 and 50+ years in which the fatality/permanent disability rate was 12.3% and 12.0% respectively. The rate was much lower in workers aged 40-49 years (7.8%).

The fatality/permanent disability rate was higher in males (13.0%) compared to females (6.7%).

Considering educational status of the injured workers, the highest fatality/permanent disability rate was observed among workers who are illiterate/read and write (21.3%). The lowest was among workers with secondary education (5.3%), whereas this rate was nearly the same among workers with primary education and diploma/bachelor (12.8% and 12.5% respectively).

Time of injury per day was associated with the fatality/permanent disability rate. the highest rate was observed in on way to/from work injuries, in which fatality/permanent disability was the end result of 34.0% of a total number of 50 cases. The fatality/permanent disability rate in evening/night shift injuries was 14.0% which is higher than that of day shift injuries (9.6%).

Table 1: Fatality/permanent disability rate by selected independent variables.

	Permanent disability / death as an outcome						P*
	Negative		Positive		Total		
	N	%	N	%	N	%	
Age group (years)							0.56[NS]
<30	79	85.9	13	14.1	92	100.0	
30-39	100	87.7	14	12.3	114	100.0	
40-49	94	92.2	8	7.8	102	100.0	
50+	44	88.0	6	12.0	50	100.0	
Gender							0.71[NS]
Female	14	93.3	1	6.7	15	100.0	
Male	388	87.0	58	13.0	446	100.0	
Education							0.05[NS]
Illiterate/Read and write (no formal education)	48	78.7	13	21.3	61	100.0	
Primary/intermediate school	126	87.5	18	12.5	144	100.0	
Secondary school	71	94.7	4	5.3	75	100.0	
Diploma/Bachelor	129	87.2	19	12.8	148	100.0	
Time of injury (per day)							<0.001
Day shift	319	90.4	34	9.6	353	100.0	
Evening/night shift	49	86.0	8	14.0	57	100.0	
On way to or from work	33	66.0	17	34.0	50	100.0	

* Chi-square test

Regarding industry, the figure below showed that about half (48.4%) of the reported workplace injuries occurred in manufacturing and mining sector while electricity sector, construction and utilities sector constituted 16.5% for each of them. Transportation sector and agriculture sector constituted 0.4% and 0.2% of the study sample respectively.

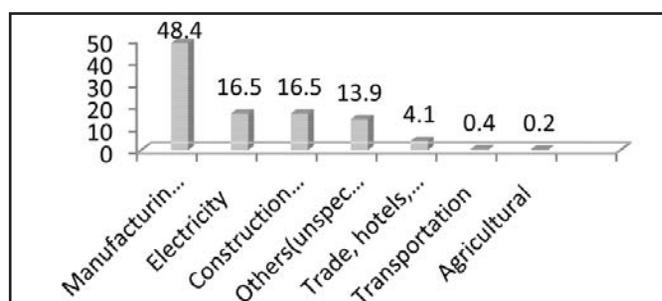


Figure 1: Distribution of workplace injuries according to industrial sector

The distribution of the injuries by month of occurrence and reporting was shown in figure2. The number of occupational injury was higher in June and July than other months of the year.

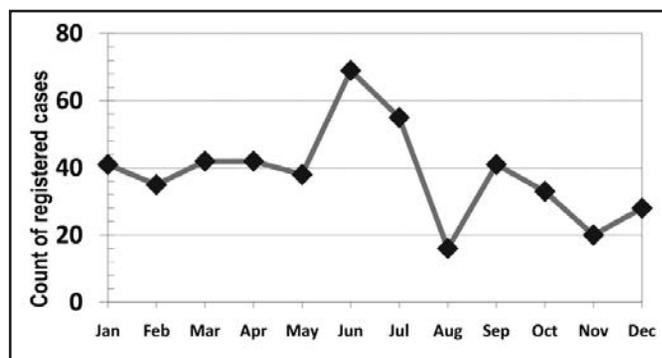


Figure 2: Line graph showing the frequency distribution of the injuries by month of occurrence and reporting.

The frequency distribution of missing data in registration case sheets was shown in table 2. About 68.4% of the records had missing information for the length of sick leave, more than two fifth(43%) had missing information about the duration of work services. Almost one quarter of subjects had no age recorded. If more than one person injured in the same accident was not answered in 14.3% of cases. The type of occupation was not recorded in 12% of cases. Finally the level of education was missing in 7.3% of cases.

Table 2: Frequency distribution of missing data in registration case sheets.

	N=467	N	%
Length of sick leave (days)		324	69.4
Duration of work in service (years)		201	43
Age (years)		105	22.5
More than one person injured in the same accident		67	14.3
Type of occupation		56	12
Education		34	7.3
Month of reporting		7	1.5
Time of injury (per day)		2	0.4

Discussion:

Although many attempts were made to reduce occupational morbidity and mortality, such injuries are still one of the most important health problems of both developed and developing countries (9,10) however, the number of studies focusing on occupational health and safety is not enough (11). According to the WHO, occupational health practice, training and research is critically dependent on an effective supply of scientific and practical information and the availability of relevant database and such database is needed for each country and for each

occupational health team (12). Up to our best knowledge this study is among the first attempts to systematically assess the quality of electronic database of occupational injuries for the years 2011-2013. Our results showed that there is no statistical association between age and fatality/permanent disability, however, some published articles argued that the youngest age group bears the highest load of fatal/severe injuries (13, 14). This could be explained by the lack of experience in younger age group (2), additionally younger workers usually work on more dangerous jobs which predispose to the occurrence of workplace injuries (15). In the current study the female gender is poorly represented in the occupational injuries database (constituting only 3.2%of the total reported occupational injuries) and only one female (1.7%)was found among the total (59) reported cases of fatality/permanent disability. Therefore; the higher death/disability rate observed in males (13%) compared to females (6.7%) was not statistically significant. Studies in the US and in Taiwan have similarly found a higher risk of fatal occupational injuries among males compared to female workers (16,17), in general men are more likely to be worked in jobs that are at higher risk for occupational injuries and deaths which pointed out to the fact that the higher risk in male gender is attributed to the type of occupation and the type of industry (18). In the current study, the educational level had no statistical association with injury severity. But, it is still interesting to mention that the highest fatality/permanent disability rate (21.3%)was observed among workers who are illiterate/read and write. This finding was in line with other published reports (19) as deficient knowledge of dangers in the workplace which results from poor education is associated with higher risk of injuries (20).Also, skilled workers do their jobs more seriously and they take care of warning signs more than unskilled, less educated workers (21). The risk of death/permanent disability was highest for the “on way to/or from work” category (34.0%). Work related road crashes account for almost half of occupational fatalities in Australia (22) and 13% of the national road toll (23). Iraq has one of the highest levels of road accident fatalities in the world and the rehabilitation of the express way will improve road safety and travel time(24). The current study showed that almost a half of the total reported workplace injuries belonged to manufacturing and mining sector (48.4%), followed by construction and electricity (each constituting 16.5%). It is similar to that in other countries (25). Also the same ranking system of occupational injuries according to industry sector found in British Columbia (26). Using the median monthly reported injuries as a baseline for evaluating seasonal variation in the current study, one would notice an obvious peak in June and July. Similar seasonal variations were observed in other studies (26, 27). High temperatures negatively affects workers alertness and concentration levels leading to increase

workers' risk of work-related injuries(28). Also, the higher construction activities and increasing the number of working hours during summer might be the reason for such difference (3). The resulting database in the current study had major differences in the completeness and accuracy of info recorded. Almost one quarter of subjects had no age recorded, the level of education was missing in 7.3% of cases. Even in the US being one of the more developed countries in the globe, no comprehensive national surveillance system for occupational injuries and illnesses is available. A recent study from US has shown that between 33% and 69% of all occupational injuries were missed (29). So it is not surprising that the current database in our study represented a very minute proportion of total occupational injuries and fatalities taking place all over Iraq. For example according to the Sentinel Injury Surveillance Report in Iraq 2010-2011, the frequency of injury cases occurred at workplace and treated at ER was 8394 (30). So that there is a wide spread under-reporting of occupational accidents, including fatal accidents in our country and much work is needed to improve and activate the documentation of occupational injuries in Iraq.

Conclusion:

A higher proportion of reported occupational accidents occurred in young male workers,during day time and among primary school graduates. Workers in the manufacturing and mining sector had the highest reported workplace injuries. Work-related road accidents had the highest fatality/permanent disability rate. The underreporting was the main problem complicating the process of determining the precise number of occupational injuries and deaths.

Author contributions:

Dr. Suhair Aljuboori): Study conception, study design, critical revision.

Israa SafaaldinAbdulmahdi: Acquisition of data, interpretation of data.

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