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THE PATTERN OF OCCUPATIONAL INJURIES AMONG GOSI INSURED WORKERS IN RIYADH OFFICE BETWEEN 2009 – 2014

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Abstract:

Objectives: *The aim of this study is to describe the pattern of occupational injuries among General Organization of Social Insurance insured workers in Riyadh between 2009 & 2014 and determine the relationship between the occupational injuries and social demographic factors.*

Methods: *Six years of occupational injuries, from 2009 to 2014, were analyzed in order to investigate the changing profiles according to the various characteristic of injuries; age, gender and nationality of the injured. Also, type of injuries and their outcome. The changing profile of occupational injuries was investigated by calculating the frequencies and incidence rate. Furthermore, we compared mean values using Chi-square test to test the difference categorical data.*

Results: *The mean age and standard deviation was 38.4 ± 9.4 years. The most frequent occupational injuries occurred in workers aged between 30 and 39 years. Non-Saudis made the majority of injuries. The most common cause that lead to occupational injuries was struck by or against an object. We found Bruises to be the most common type of injury and led mostly to cure without disability. Disability rate for the past 6 years was 287.6 per 100,000 and mortality rate for the same period was 30.2 per 100,000.*

Conclusion: *This study found that the population at is non-Saudi men workers aged 30 – 39 years. Hence, they should be the target of safety strategies and further studies should be done to monitor them.*

Key words: *Occupational injuries, Fatal, Injury, Disability, Insured workers.*

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INTRODUCTION:

Globally occupational injuries are considered a major health issue. They have a socioeconomic disadvantage on both personal and governmental levels [1]. On the personal level, occupational injuries have adverse effects on the worker's work, relationships, and mental health [2]. Leading to a more permanent effect on the quality of his life [3]. In United States of America work related injuries have substantial morbidity and mortality and are present even among adolescents [4]. On the other hand, the society will suffer in terms of economic costs and human suffering. Several studies have been done to estimate the magnitude and cost of occupational injuries in the United States and elsewhere [5,6,7,8,9,10] For example, occupation-related deaths, illnesses and injuries have a total cost to society of over $23 billion each year [5].

In European Union [EU] countries, every 5 seconds a worker has a work accident and every 2 hours a worker dies because of these accidents. There were variations in the pattern of occupational injuries among EU countries, some of these countries had a constant decline as in Denmark, Belgium, and Austria, and others had an increase pattern as in Sweden, the United Kingdom [11]. A study estimated that the average fatal occupational injury rate in the Gulf Cooperation Council [GCC] countries was 8 deaths per 100,000 workers [12]. However, a hospital based data analysis in the UAE reported the incidence of severe occupational injuries as 136 per 100,000 workers per year [13].

The incidence rate of injuries markedly differs between various jobs and workplaces [14]. Additionally, personal characteristics of the injured workers such as the socioeconomic position, working conditions, safety practices [15], lack of academic education [16] and inadequate work experience [17], as well as personality [15], risky behaviors [18], smoking [19] and if the person is a foreign worker [20]. Furthermore, the age of workers, gender, work hours, and the workplace size will affect the incidence rate of occupational injury [21,22,23,24].
Occupational injuries are documented in Saudi Arabia by three organizations; the Ministry of Labor's Public Pension Agency, Ministry of Health and General Organization of Social Insurance [GOSI]. This study investigate the trend and profiles of occupational injuries, that occurred to insured workers by GOSI in the various economic sectors between 2009 and 2014 in terms of various criteria including the individual's characteristics and injuries outcome.

Authors hypothesized that the yearly trend of occupational injuries according to the province, age, nationality and type of accident will be different.

We aim to identify the high risk group of occupational injuries which is very useful in prevention. Moreover, occupational injuries in The Kingdom of Saudi Arabia and those of different countries will be compared. The purpose of this study is to identify the problematic population in the perspective regarding the trend of occupational injuries.

MATERIAL AND METHODS:

The General Organization of Social Insurance [GOSI] implements social insurance rules, collects contributions from employers and pays benefits to entitled insured workers and their family members in Saudi Arabia. In our study, the term Occupational Injury was defined by GOSI as injuries that occur in any of the following cases: 1. Accident sustained by the contributor during work or from which it resulted, 2. Accident sustained by the contributor on his way from his residence to his place of work and vice versa, or while en route from his place of work to the place where he eats his meals or perform his prayers and vice versa, 3. Accident sustained by the contributor during his movements in order to perform the tasks entrusted to him by the employer, 4. Any injury sustained by the contributor found to be caused by work [25].

Our study is a descriptive retrospective study that reports the characteristics and measures the incidence of occupational injuries reported by GOSI's Riyadh Office between 2009 and 2014. Data was retrieved from GOSI's electronic database. Our variables included the number and demographics of insured workers including age, gender, nationality, and industry category. Moreover, it included the occupational injuries reported to GOSI between 2009 and 2014 as well as the demographics, cause, nature, and outcome of injury.

Data was entered and analyzed using Statistical Package for the Social Sciences [SPSS] version 21.0. Continuous variables quantified by mean and standard deviation [SD]. Chi-square test used to test the difference categorical data. Moreover, we calculated the incidence of occupational injuries in each year per 100,000 insured workers by considering the total number of insured workers in Riyadh office as the dominator and the insured workers in Riyadh office who faced an occupational injury as the nominator at the studied period.

RESULTS:

Data retrieved from GOSI's database showed that the number of workers insured by GOSI in Riyadh Office increased from 1,226,839 workers in 2008 to 3,478,523 workers in 2014 representing a 2.7-time increase. During the same 6-year period, 134,836 workers were confirmed as having an occupational injury. The incidence of occupational injuries dropped from 15.9 per 1000 insured worker in 2009 to 6.0 per 1000 insured worker in 2014 [Table1].

Table 1: Numbers of GOSI insured and injured workers registered in Riyadh office by Year

Study Period		Insured		Injured	
		Cumulative	New n [%]	Injured n [%]	Incidence per 1000 insured
Year	2009	1,424,821	197,982 [9.6]	22,605 [16.8]	15.9
	2010	1,585,788	160,967 [7.8]	27,513 [20.4]	17.3
	2011	1,837,602	251,814 [12.3]	27,088 [20.1]	14.7
	2012	2,374,328	536,726 [26.1]	21,602 [16.0]	9.1
	2013	3,116,042	741,714 [36.1]	16,411 [12.2]	5.3
	2014	3,280,541	164,499 [8.0]	19,617 [14.5]	6.0
Total			2,053,702 [100]	134,836 [100]	

When the incidence rate was calculated the numerator was the number of injured workers during the period of 2009-2014 and the denominator is the number of all insured workers during the giving period. The rate of occupational injuries has increased in the first two years and started to decrease reaching 5.97 in the following years. Despite this fluctuation, the overall pattern of injured workers has not changed tremendously even though the incidence rate has started to decrease and number of registered workers is increasing [Figure1].

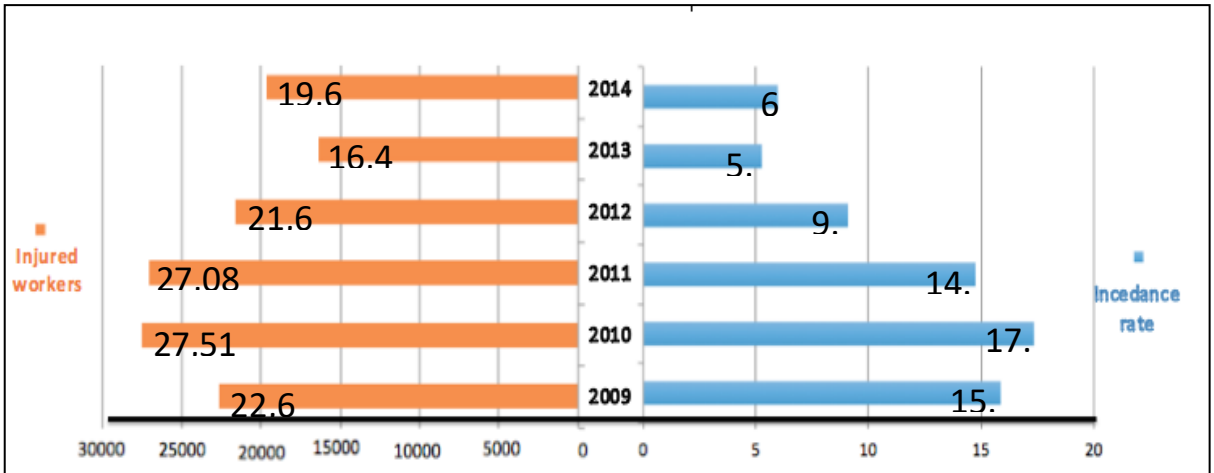

Figure 1: Incidence related to number of injured workers between 2009 and 2014

Injured workers included 134,062 [99.4%] males and 774 [0.6%] females. The rate of female injured workers fluctuated from 0.3% in 2010 to 1.0% in 2014 of the total number of injured workers. The year of 2014 had the highest number of female injuries with 188 injuries and the year of 2010 had the highest injuries among males by 27,420 injuries. The mean age ± standard deviation was 38.4 ± 9.4 years. Most of the injured were workers in the 30 to 39 year [44.1%] age group. In contrast, the age group from 70

and more year-old had the lowest number of injuries with a percentage of 0.2% of total injuries. Non-Saudis represented the majority [95.8%] of the injured workers, while Saudis accounted for only 4.2% of injured. This observation was consistent over the period studied. In 2010, occupational injuries among Saudis reached its maximum number with 1,123 injuries in one year representing 4.1% of all injuries in that year [Table 2].

Table 2: Occupational injuries by Nationality between the years 2009 and 2014

Gender	Study Period						Total	P Value
	2009	2010	2011	2012	2013	2014		
Non Saudi	21,496 95.1%	26,390 95.9%	26,089 96.3%	20,784 96.2%	15,624 95.2%	18,815 95.9%	129,198 95.8%	< 0.01
Saudi	1,109 4.9%	1,123 4.1%	999 3.7%	818 3.8%	787 4.8%	802 4.1%	5,638 4.2%	
Total	22,605 100%	27,513 100%	27,088 100%	21,602 100%	16,411 100%	19,617 100%	134,836 100%	

When we looked into the most common causes of occupational injuries, we found that struck by or against an object caused 12.9% of all injuries in 2009 and increased to 34.4% of the injuries in 2010. It caused only 21.9% of injuries in 2014. Fall from elevation increased from causing 11% of the injuries in 2009 to cause 26% in 2010 and has continued to increase in the following years causing 30.4% of the injuries in 2014.

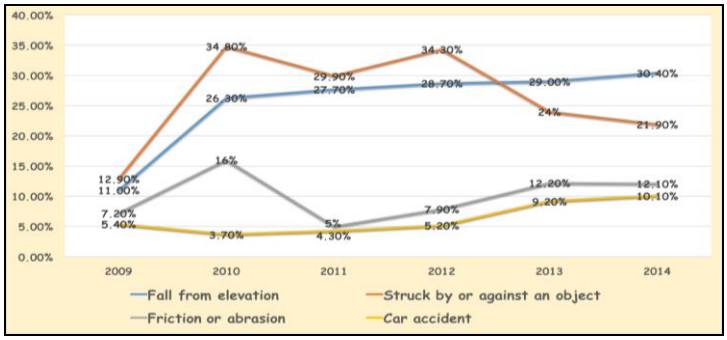

Figure 2: Causes of Occupational Injuries

Afterwards we looked into the most common type of injury in our study and it was bruises [33%]. Followed by infections [23%], then cuts [19%]. Fractures came in fourth place with a percentage of 10% even though it led to the highest number of deaths in our study.

Finally, the outcome of these injuries was only available for 117,608 [87.2%] injured workers. Of those 90.7% of were cured without any disability. The occupational injuries led to a disability in 9,944 [8.4%] of the injured workers, while it resulted in the death of 1,049 [0.9%] of them.

DISCUSSION:

In our study we describe the pattern of occupational injuries among GOSI insured workers in Riyadh Region. There has been no published report describing the pattern of injuries in the Riyadh region. In addition to that there has been no report regarding occupational injury patterns in Saudi Arabia since 2003.

The 2014 incidence rate in our studied population was 597.98 per 100,000 workers. This is significantly lower than the 7,399 per 100,000 workers reported for Saudi Arabia in 2003 [12]. The same report describes the injury rate of 9,249 per 100,000 in the United Arab Emirates, 12,794 per 100,000 in the Syrian Arab Republic, 12,399 per 100,000 in China, and it was 7,112 per 100,000 in Canada [12]. The large difference in the occupational injury rate we reported could be explained by the fact that we are studying only a sub-population of the workers in the Saudi Arabia whom are insured by GOSI. If we were to include occupational injuries reported by the

Ministry of Labor's Public Pension Agency, the incidence might increase. The other possible explanation is that we studied occupational injuries in the Riyadh Region only. This region is one of the most developed areas when it comes to implementation of labor law and prevention programs. The rate of occupational injuries might increase if we measured the occupational injuries in less developed areas.

Our study shows that the number of workers almost doubled [increased by 2.7 times] between the year of 2008 and 2014. This resulted in the number of workers at risk of injury increased by more than 2 million workers in 6 years. In spite of this increase in the number of workers, the incidence of occupational injury dropped from 15.9 per 1000 insured worker in 2009 to 6.0 per 1000 insured worker in 2014. We propose that this drop in the incidence in the face of an increase in workers' numbers is mostly due to the increasing number of registered workers in the non-dangerous work sectors [e.g.: office jobs, doctors …etc.]. So even if the number of insured workers increased, the number of injuries stayed the same leading to the decreased incidence rate. The incidence of occupational injuries is also strongly related to the safety training and measures implemented in the workplace. Safety training may reduce the possibility of a worker to get injured. Another explanation is that there was a great improvement in the development and monitoring of work related safety programs in the Riyadh Region over the study period, to which we do not have any evidence for.

Our study showed that occupational injuries are significantly higher among male workers compared to female workers. This is because of the significant difference in the ratio of male to female insured workers in our study population. This is consistent with reports from other developing countries with demographics similar to Saudi Arabia [26]. We also found that occupational injuries occurred among workers aged between 30 - 39 year-old were higher than other age groups which is similar to what was already found in Iran [26]. It can be due to the high number of insured workers from the same age group or due to the nature of jobs assigned to this age group. Also, the work experience of a worker increases with age leading to a less risky behavior.

Since most workers in the studied sectors in Saudi Arabia are non-Saudis, a major difference was obvious in the number of injured workers. Non-Saudis made 95.8% of all insured injured workers and Saudi workers were only 4.2%. This is may be due to the lack of Saudi workers in the studied sectors, which led most companies to recruit workers from different countries such as: India, Pakistan and South Asia.

Most injuries in our study was caused by being struck against an object. In contrast with slip and fall reported to by the leading cause in Iran and South Korea [26,27].

The majority of accidents resulted in full recovery without any disabilities and this is may be due to that most injuries are bruises which are considered as a minor injury with minimum effects. By taking the year of 2010 as a reference, 89.3% of injured workers cured without disabilities, 7% of injured workers were cured with disabilities and 0.7% of workers died of these injuries. When comparing 2010 with 2014, we see that the percentage of injured workers who were cured without disabilities has decreased to 87.2%. The year of 2012 had the highest numbers of cases that resulted to death. More than 200 workers have died due to occupational injuries in that year but it only represents 1% of cases. When we also compare the percentage of death in this year with the year of 2014, we notice that the percentage increases to 1.5% even though the number of deaths is lower than the number in the two preceding years. This is could be due to the low number of total injured workers in 2014.

CONCLUSION:

We conclude that the population at risk in our study are non-Saudi men workers aged 30 – 39 years due to the high number of injuries they scored and should be the target of safety programs. The most common causes that lead to occupational injuries were Struck by or against an object, fall from elevation and friction or abrasion. Bruises were the most frequent injury in all studied years and led mostly to cure without disability. The total mortality rate was 30.2 per 100,000 throughout all the studied years and the disability rate was 287.6 per 100,000. In the year of 2014 Riyadh mortality rate was 5.2 per 100,000. When compared to other studies, we found Iran mortality rate is 13.3 and Sudan is 21.4 and United States is 5.0 and Saudi Arabia is 7.0 in 2003 [12].

We recommend that further research of occupational injuries and their causes in all of Saudi Arabia should be done to fully assess the magnitude of occupational injuries issue in Saudi Arabia. We also need better prevention programs and safety training at workplaces to prevent being injured due to struck by or against an object and falling from elevation. Furthermore, Implementation of one registry system to document all occupational injuries occurring in

Saudi Arabia with standardized definitions of injuries to make it easier for researchers.

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