related illnesses or acquired disabilities is a complex task. However, it is vital that policy-makers be aware of the scope and scale of poor or non OSH in order to implement effective measures in this policy area. If we do not value life and health impacts, we will implicitly make a trade-off or these values may get even assigned zero-weight.

Methods The first phase of the large-scale study commissioned by EU-OSHA in 2015, consisting of an identification and assessment of the available data relevant to costing models that is available in each of the Member States. We concluded that the development of a comprehensive, comparable estimate covering all EU member states would not be feasible at present due to the lack of data at national level. Therefore it was decided that the second phase of the project would consist of two strands.

Results First, EU-OSHA collaborated in the development of updated ILO estimates, based on available data at international level, to calculate an approximate cost estimation for each EU member state including Norway and Iceland. The findings reveal that work-related injury and illness result in the loss of 3.7% of GDP globally (EU28 3.1%), at an annual cost of roughly € 2.206 billion (EU28 € 446 billion) Second we commissioned research to develop a comprehensive cost estimate for five member states, where sufficient data for such a calculation is available. These results can also be used to validate and refine the ILO estimates for the European level.

Discussion The results confirm earlier research that a high level of prevention contributes to the productivity and wealth of a country. Lower prevention results in higher costs to society

197 MODERN WAYS OF PROMOTING SAFETY MESSAGES

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Introduction Increasing number of accidents and incidents in organisation each year which included fatalities, serious injuries have had a great impact on the production, efficiency, reputation, progress and financial reports of the company.

The problem is the people and the task is to change the culture. Make them realise to work safely at their own, even if not supervised.

Now the businesses are adopting a new safety culture by using digital practices to reach their employees via digital displays, desktop communications and handheld devices through which the real time messages could be transferred to the work force to take timely a safe action in the field on dangerous and hazardous material and equipment.

This writing provides a summary of efforts for the best modern practices applied for messaging for the company employees. It is applied in an Electricity distribution company.

During its operational and maintenance activities where daily risk associated jobs are carried out by the workers, miles away from office desk in the field and it also applies to the office employees too.

The paper concludes with some suggestions and adoption of best practices of safety messages promotion for on job accidents' prevention.

Method Various meetings were held in this regard on top, middle and at lower management level, many discussions done, surveys conducted, interviews done from the workers and opinions sought from the field and office staff too.

Discussion and result After discussions and interviews, meetings, it was decided that along with other tactics, also the services of the software development companies required to be hired to design a system of our ideas for the communication and promotion of safety messages to our staff in real time.

213 WORK ACCIDENTS/INJURIES REGISTERED IN IRAQ FOR THE YEAR 2016

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Introduction The existing legislation for occupational accidents diseases and injuries did not made us gain real information about the magnitude of the problem in Iraq.

Therefore we implemented a new way for registration of occupational injuries through the cooperation between the CIS centre/NCOSH/MoLSA/ and the planning directorate/MoH in Iraq, since 2012, so that build and gain basic informations about the epidemiology of the problem, to be able to improve the national planes to reduce and trying to stop them.

Methods The emergency clinics in all Iraqi governorate hospitals filled up a questionnaire paper prepared for this purpose and then sent them to the MoH and then to the NCOSH – CIS centre, where a special electronic program was prepared to enter the informations of the questionnaire papers, then studied statically and gain the needed results.

Results and discussion The yearly numbers of the registered cased according to the legislations and since more than 40 years was around 200 cases only. While according to the new program the number became between 4000 to 7000 cases each year for the last 5 years.

96.74% of the registered cases were male worker.

49.5% of the age group 15–29 years, while 36.8% of the age group

30–44 years of age.

76.4% of the work injuries happened to workers in the private sector.

81.4% happened in the work place while 18.9% were commuting accidents.

67.1% happened during morning work shifts.

30.9% caused by machines and instruments, and 21.9% because of falls.

18.4% affected the workers heads, 18.1% the left upper limbs and 17.4% affected the right upper limbs.

2014 registered work accidents caused wounds to the injured workers, 1135 caused only bruises and scratches, and 601 fractures to the affected workers.

The total registered number of workers deaths was 17 cases during the year 2017.

41.1% of them were from governmental sector, 47% were because of terrorists, 23.5% because of electric shocks and also 23.5% because of lifting and transport media while 5.8% because of exposure to chemicals.

Aim Gaining and building the basic information about the magnitude and epidemiology of work accidents and injuries in Iraq, so that to improve the national planes to reduce and trying to stop them.

Objectives

- To increase the scope and effectiveness of the investigation of causes of occupational accidents, and the identification and implementation of preventive measures.

- to promote awareness among health care providers of the potential effects of their work upon the health of their patients with view to assisting competent authorities in the compilation of more comprehensive information on occupational accidents, dangerous occurrences and incidents.

Experimental design and methodology In Iraq and for the last 50 years, the relevant legislations were not effective, so that the total yearly numbers of the registered work injuries were around 200 cases almost every year.

The CIS centre in the Iraqi NCOHS started a new approach for registration of occupational accidents through the emergency clinics in the hospitals.

The new way was implemented since the year 2012 with the cooperation of the ministry of health – planning directorate – department of health statistics.

The CIS centre accomplished a questionnaire paper, distributed, officially through the MoLSA NCOHS and the MoH-planning directorate to all Iraqi hospitals emergency clinics, in 15 governorates, except the Iraqi Reign Kurdistan 3 governorates, to be fulfilled by the emergency staff and statisticians in the hospitals.

These papers were sent officially to the MoH and then the MoLSA to the NCOHS – CIS department.

A special electronic program was prepared to enter the data of the questionnaire papers, and to be studied statistically to gain the needed results yearly.

Discussion Graph No.1 shows the numbers of occupational accidents that where registered in the emergency clinics in Iraqi hospital of all the governorates except Kurdistan region, for the years 2012 up to 2016.

It was clear that during the starting year 2012, the number was 2570 occupational accidents and it increased to reach 7147 occupational accidents during 2014 and then decreased after the invasion of ICIS to 3 major governorates that stopped registration of occupational accidents since then, to reach 4966 in the year 2016.

However, we recognised that most of the hospitals in almost all the included governorates sticked to this program of registration of occupational accidents.

Graph No.2 shows the numbers of occupational accidents registered in the emergency clinics, for the years 2012 up to 2016 divided according to the governorates.

Where the Medical City Hospital registered the highest number 2774 during the year 2015, coming next the hospitals of the governorates, Baghdad Al-resafah, Kerbala, Babylon, Diyala and the least numbers where registered in Al-Basrah, Al-Najaf and Kerkuk governorate hospitals.

And because of the ICIS crises 3 governorates stopped all contacts with this program.

However, Al- Diwaniya, wasit, Misan governorates where not cooperative at all in this program since the start till now.

Graph No.3 shows the number and percentage of occupational accidents divided according to the sex.

Where 96.76 of them affected the male workers 3.24% and female workers.

Graph No.4 shows the number and percentage of occupational accidents divided according to the age groups of the injuries workers.

Where 49.54% happed to the age group 30–44 year.

Graph No.5 shows the number and percentage of occupational accidents for the year 2016 divided according to work sectors Where the majority registered to workers working in the public sectors 76.42%, 21.65% in the private working

sector, and only 1.93 occupational accidents where registered to be from the combined work sector.

Graph No.6 shows the number and percentage of occupational accidents for the year 2016 divided according to place of accidents where 81.1% happened in the working place, while 18.9% where commuting accidents.

Graph No.7 shows the occupational accidents for the year 2016 divided according to work shift.

Where 67.18% took place during the morning work shift, 24.6% during the midday shift.

While only 8.66% of occupational accidents where registered during the night shift, however this percentage is high if we considered that the night working shift are very very limited in Iraq because of the bad security situation.

Graph No.8 shows the number and percentage of occupational accidents divided according to the cause.

Where the highest percentage 30.93% of occupational accidents happened because of machines and instruments, 21.97% because of stumble and fall and to a less extent others (explosions and bullet injuries) 17.78%, 15.42% because of transport media.

Graph No.9 shows the number and percentage of occupational accidents divided according to the place of the injury in the body.

Where the highest percentage affected the head 18.43%, 18.16% affected the left upper limbs, 17.48% affected the right upper limbs.

Graph No.10 shows the number and percentage of occupational accidents divided according to the type of the injury to the workers.

Where the highest type of injury was 2814 wounds, 1135 bruises and scratches, and 601 fractures.

Graph No.11 shows the number of deaths caused by work accidents divided according to work sector.

Where the total number of deaths during the year 2016 were 17 cases, 58.82% happened in the public sector and 41.18% in the private sector, and no deaths where registered because of work accidents and injuries in the combined sector.

Graph No.12 shows the number of deaths caused by work accidents divided according to health directorates in the Iraqi governorates.

Where 6 cases were registered in Diyala, 5 in AL- Diwaniyah, 4 in AL-Basrah and 2 in AL- Najaf governorate hospitals.

hs caused by work accidents shows the number of death-Graph No.13 divided according to cause of work injury.

Where electrical shock caused (4) deaths, transport media caused (4) deaths also, while exposure to chemicals caused (2) deaths.

However, the deaths because of others causes (explosions and bullets).

(6) Registered the highest cause for occupational deaths.

Results and conclusion - During the enforcement of this program since 2012 till now, it was obvious that it reached a stable situation of accomplishment.

This was according to the plan designed by the Iraqi Safety and Health Information Centre/MoLSA with the cooperation of The Department of Planning/MoH, to be accomplished through the emergency clinics in Iraqi hospitals.

Where the registered numbers reached many thousands each year.

While via the already existing Iraqi laws since more than 40 year, the registered numbers of occupational accidents where, between one hundred up to two hundred cases only, each year.

- However we concluded variations in the implementation of the program between the health directorates of each governorate, and also between the hospitals of the same health directorate in the governorate

- Most of the registered work accidents were between male workers
- (96.74%) and mostly the middle age group 15–29 years (49.54%), 30–44 years (36.81%).
- (76.42%) of these registered work accidents happened to workers in the private sector of the work.
- And (81.1%) happened in the work place, while 18.9% were commuting accidents.
- (67.18%) of these accidents happened during the morning work shifts.
- The machines and instruments caused (30.93%) of the registered work accidents, and (21.97%) were because of falls.
- (18.43%) affected the workers heads, (18.16%) affected left upper limbs and (17.42%) affected right upper limb.
- 2014 registered work accidents caused wounds to the injured workers, 1135 caused bruises and scratches, and 601 work accident fractures to the affected workers.
- The total numbers of workers deaths registered because of work accidents for year 2016 was 17 deaths.
- (41.18%) 10 of them happened to workers working in the governmental (public) sector, (39.82%) 7 in the private sector.
- 6 deaths registered in Diyala governorate, 5 in AL- Diwaniya, 4 in the AL- Basrah and 2 in AL- Najaf governorate.
- (47.05%) 8 were because of terrorist works, (23.52%) 4 because of electric shock, also (23.52%) 4 because of lifting transport media, and (5.88%) one death case was because of exposure to chemicals.

Recommendation

- It is a must that a National law for Occupational Injuries is implemented in the country.

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MANAGING JOB STRESS TO PREVENT NEEDLESTICK INJURIES IN EMERGENCY DEPARTMENTS: RESULTS OF AN ITALIAN MULTI-CENTRE STUDY

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Introduction The prevention of needlestick injuries (NSIs) represents a challenge to safety and health of healthcare workers (HCWs) employed in Emergency Departments (EDs), globally. Although, by literature, the use of Safety Engineered Devices by HCWs represents an effective way to prevent NSIs, organisational interventions targeted to decrease job stress have been suggested effective in minimising the occurrence of NSIs. The purposes of the present multi-centre study were:

- to investigate the relationship between interventions focusing job stress and NSIs occurrence among nurses employed in Hospital EDs;
- to quantify the economic impact of such interventions on the safety budget.

Methods The authors compared the NSIs occurrence among nurses employed in three Hospital EDs in two 4 year periods, after and before organisational interventions aimed to manage job stress, respectively. Finally, the economic cost of NSIs occurrence was calculated. All analyses were performed using SPSS software for Windows.

Results The cumulative 4 year incidence of NSIs occurred after organisational interventions focusing job stress was significantly lower than the cumulative 4 year incidence observed prior to such interventions ($p < 0.05$). By results, significant cost saving from managing fewer NSIs than the previous period was found.

Discussion In the present study, organisational interventions aimed at managing job stress revealed effective in preventing NSIs and, consequently, in decreasing the economic cost due to NSI occurrence. Furthermore, the authors demonstrated that a proactive, integrated and comprehensive management of job stress brings benefits to employees and reduces the burden of the NSIs occurrence. These findings highlight that the issues of job stress and workers' safety are interconnected and hence, a special effort is required in order to minimise job stress with the aim to reach the goal of safe, health and productive workplaces in healthcare sector.

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DEVELOPING A DESIGN AND IMPLEMENTATION METHODOLOGY OF A LEAN AND SAFE MAINTENANCE DEPARTMENT

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Introduction Most maintenance departments are implemented and improved as a result of the company's growth. Subsequently, if the company chooses to adopt a Lean approach, it will adapt its production operations according to the specific principles and tools of that approach. Finally, once the production is Lean adapted, the company will reorganise its maintenance department to meet the principles of the Lean approach. On the other hand, what if a company already operates according to the Lean production approach before the creation of a maintenance department? The aim of this project is to develop a design and implementation model of a Lean-type maintenance department focused on occupational health and safety (OHS).

Methods As a first step, the approach was to establish a profile of the current situation of the company regarding the three key concepts of this study: Lean, OHS and maintenance. Some data collected are the testimonials of the company's employees about these concepts. Participants went through semi-directed interviews. In addition, the employees performing maintenance tasks on equipment (operators performing basic routine maintenance and the others performing more advanced maintenance) were also observed in these maintenance tasks.

Result The results are a profile of the industrial partner drawn up according to a study of the frequency of the participants' answers as well as the risk observation tables analysed according to a model developed by *Institut de recherche Robert-Sauvé en santé et sécurité du travail*. The implementation model was developed according to the results obtained.

Discussion This case study focuses mainly on a small and medium-sized enterprise (SME) in growth, as it corresponds to their background. Moreover, since not all SME's can afford nor have the knowledge for such studies, this model will be a good starting point for similar firms and companies.