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Adopting Criteria for Determining the Value of Compensation for Workers in the Construction Sector in Iraq As a Result of Work Accidents

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ABSTRACT

Safety programs are a humanitarian message developed by government bodies to protect the human race from various accidents and injuries as well as protecting all property from machinery, equipment and various materials. Despite the interest of the countries of the world and especially the developed countries in the subject of occupational health and safety, this topic did not receive the attention required by the higher departments in most of our construction sites. This research aims to adopt criteria to determine the value of compensation of workers in the construction sector in Iraq as a result of work accidents. In this research several means were used to verify the value of compensation for workers in the construction sector in Iraq, such as using the questionnaire as a means of determining compensation criteria for injuries resulting from work accidents. The sample of the research was selected from engineers with experience in implementing construction projects and employees working in other specialties such as (judiciary, law and health), Where (31) persons who are directly related to the subject of the research. Some statistical methods (arithmetic mean, standard deviation, coefficient of variation, relative importance, truthfulness test, and stability) were carried out, through which the data were processed, and the results were interpreted accordingly. The value of financial compensation was extracted for the injuries suffered by workers as a result of work accidents (Working days) and according to criteria extracted based on the results of the questionnaire, in order to prepare stable standards of compensation that can be relied upon at any time and place, and for all construction projects in all Iraqi provinces. This research concludes that the lack of a clear system for compensating work injuries in construction projects and the adoption of compensation for personal and several considerations (regional and tribal) and others.

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اعتماد معايير لتحديد قيمة تعويض العاملين في قطاع التشييد في العراق نتيجة حوادث العمل

عبد الرحمن عدنان ابراهيم / قسم الهندسة المدنية / كلية الهندسة / جامعة تكريت ، العراق
فرح عواد سلطان / قسم الهندسة المدنية/كلية الهندسة / جامعة ديالى ، العراق

الخلاصة

تعد برامج السلامة رسالة انسانية وضعت من قبل الهيئات الحكومية لحماية الجنس البشري من الحوادث والاصابات المختلفة وكذلك حماية جميع الممتلكات من مكائن ومعدات ومواد متعددة. وبالرغم من اهتمام دول العالم وخاصة الدول المتقدمة بموضوع الصحة والسلامة المهنية الا ان هذا الموضوع لم ينل الاهتمام المطلوب من قبل الادارات العليا في اغلب مواقعنا الانشائية. يهدف هذا البحث الى اعتماد معايير لتحديد قيمة تعويض العاملين في قطاع التشييد في العراق نتيجة حوادث العمل. وقد استعملت عدة وسائل للتحقق من قيمة تعويض العاملين في قطاع التشييد في العراق مثل الاستعانة باستمارة الاستبانة كوسيلة لتحديد معايير التعويض للإصابات الناتجة من حوادث العمل. وقد جرى اختيار عينة البحث من المهندسين ذوي خبرة في تنفيذ المشاريع الانشائية وموظفين عاملين في اختصاصات اخرى مثل (القضاء والقانون والصحة) وكان عددهم (31) شخص من الذين لهم علاقة مباشرة بموضوع البحث. وقد استعمل الباحثان بعض الاساليب الاحصائية المتمثلة (الوسط الحسابي والانحراف المعياري ومعامل الاختلاف والأهمية النسبية واختبار الصدق والثبات) والتي تم معالجة البيانات من خلالها ، ومن ثم تفسير النتائج بالاعتماد عليها ، تم استخراج قيمة التعويضات المالية للإصابات التي يتعرض لها العمال نتيجة حوادث العمل بطريقة (ايام عمل) ووفق معايير استخرجت بالاعتماد على نتائج الاستبانة ، وذلك لإعداد معايير ثابتة للتعويضات يمكن الاعتماد عليها في اي زمان ومكان ، ولجميع مشاريع التشييد في كافة المحافظات العراقية. استنتج البحث عدم وجود نظام واضح لتعويض اصابات العمل في مشاريع التشييد واعتماد التعويض على الاجتهادات الشخصية وعدة اعتبارات منها (مناطقية وعشائرية) وغيرها.

الكلمات الدالة: المعايير, التعويضات, الإصابات , حوادث العمل.

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1. INTRODUCTION

The science of safety and security: A science that takes care of the protection of human beings and protection from risks and prevent loss of property and lives. It is also known as the first line of defense against the occurrence of disasters and accidents in various areas of life wherever man found in the factory, school and car and also maintains the safety of equipment, machinery and capital, hence the importance of this science. Technological advances have resulted in a wide development in the industries, where the use of complex technology during the implementation led to a greater likelihood of accidents, and the lack of interest and experience led to a significant increase in injuries and the result was a deficit (partial or large) in achieving that development, and therefore necessitated need for Science works on:

A. Identify risks and study ways to avoid them.
B. Conducting awareness seminars and practical courses to raise the level of workers in the field of occupational safety.

Occupational safety in construction projects is very important, which has been associated with the development and complexity of the machinery, as well as the increased use of machinery in various construction works which led to in the end to many accidents and injuries. Prevention of accidents is a humanitarian duty above all.

Looking at the previous research in the field of occupational safety and work accidents, we have noticed the lack of research in this field despite the importance of this topic and its relation to human life.

The following are the previous researches and studies dealing with work accidents and occupational safety:

Hassan's Study [1]. This study deals with the concept of industrial safety and its elements and the steps to be taken to reduce work accidents.

Ani's Study [2]. This study dealt with all types of costs in construction sites, including the cost of accidents.

Abbas and Nashaat [3]. This study dealt with the importance of wearing personal protective equipment which leads to reducing injuries resulting from work at construction sites.

Fakhri's Study [4]. This study dealt with the compensation of work injuries through the formation of a central committee in the Cabinet of the Ministry of Industry and Minerals to look into determining the type of injury and the percentage of physical disability resulting from it, in addition to drawing up a planning budget for the monetary compensation paid to the injured in various work accidents.

Tamimi's Study [5]. This study deals with working conditions and their impact on the performance of workers and one of its axes is addressed to work accidents and the impact of bad weather conditions on the increase of accidents. Also [6] found that poor business performance, such as time delays and cost overruns, are common in construction projects

This shows that there is no detailed independent study of a clear safety system applied especially in construction projects in Iraq. The justification for conducting the research can be summarized as follows:

A. Frequent work accidents during the implementation of construction projects.
B. There is an urgent need to establish criteria to determine the value of compensation of workers injured as a result of work accidents in the construction sector in Iraq, due to the large size and complexity of projects.

Through the above justifications, it is possible to conclude that the research hypothesis is the need for a fair and comprehensive compensation system to determine the appropriate compensation for worker injuries during the implementation of construction works

The research aims at the following:

A. Study the impact of work accidents and safety programs on work costs and identify how personal protection of the individual worker during work through the review of scientific references.
B. Identify and classify the types of injuries suffered by workers in the construction sector in Iraq and the percentage of the resulting deficit.
C. Prepare criteria for compensation of workers injured as a result of work accidents and injuries at construction sites.

2. THE CINCEPT OF OCCUPATIONAL SAFETY

Occupational safety is the removal of danger from the work area or work to reduce it if it cannot be removed [7]. Occupational health and safety can be considered a protective mask for members of society against all accidents and dangers that occur inside and outside the work, and to avoid occurrence in shops, homes, companies, industrial institutions and public places, so individuals must be fully aware of the concepts and foundations of occupational health and safety [8].

Occupational safety and health can be defined from the researchers' point of view as a science that is concerned with maintaining human safety and health, by providing safe working environments free from the causes of accidents, injuries or occupational diseases, or is a set of procedures, rules and regulations to keep humans from the risk of injury and property from danger Damage.

The concept of work injuries: It is one of the results of accidents and is either internal or external and may be classified in three levels: minor injury, moderate injury and severe injury [9]. Occupational injuries and occupational diseases pose a serious threat to the lives of workers who form the economic basis of any country. A statistic by the International Labor Organization (ILO) shows that there is a death every three minutes resulting from a work injury. Every hundred deaths occur in the world, fifteen of them are the result of a work injury [10].

Concept of work accidents: an accident is all that affects any of the elements of production and leads to a loss of it, and is also known to be the occurrence of something unexpected resulting in injury, death or demolition [11]. Accidents in some cases result in physical or psychological damage to workers and called injury. (Civil Technology, Cooling & Air

Conditioning). Work accidents are classified according to a number of criteria, the most important of which are [12]:

A. Results.
B. The degree of severity.
C. The cause of falling.
D. The possibility of avoidance.

According to the researchers' opinion, the most important negative effects of accidents are material losses where the loss can be defined as the total or partial decrease in the value of property or objects as a result of a particular incident.

3. METHODES OF PREVENTION OF WORK ACCIDENTS

The prevention of accidents is often possible, but we cannot say that it can be prevented completely, but certainly they can be reduced significantly and so as not to significantly affect the production process [13]. To avoid accidents is much better than to face their consequences. Accidents can reappear over and over again because of negligence or recklessness or lack of knowledge of the work performed. [14].

The recommended accident prevention methods apply to all work sites, whether the site is occupied by 15 people or 15 thousand people, the grounds are the same because the global statistics for 1970 indicate that most countries in the world share this designation of accidents of death. [12].

The most important safety rules that must be presented and applied by each official in the work site from the project manager to the engineer to reduce accidents are [12]:

A. Explain the causes of accidents to all workers in the workplace.
B. Giving instructions and training on how to safely accomplish work.
C. Make the workplace tidy, organized and permanently clean.

4. QUESTIONAIRE DESIGN

The process of preparing the field questionnaire has gone through two phases before it is finalized

4.1 The questionnaire creation phase

Questions have been created for the questionnaire through the theoretical review of the sources that dealt with all matters related to occupational safety issues and their availability in the sites.

4.2 Development of questions of the questionnaire

After preparing a preliminary list of questions of the questionnaire, the researchers conducted a number of personal interviews with engineers experienced in the implementation of various construction activities to formulate the questionnaire questions more comprehensively and in accordance with the pursuit of ambition. The research questionnaire consists of two axes.

4.3 Specification of sample personnel:

The researchers selected the sample of the questionnaire from the engineers working in the implementation of construction projects and university professors who work in consultancy offices and have long experience in their area of specialization. Experts from the judiciary, law and health have been hired to determine the correct estimate and to establish consistent criteria for future compensation. The sample was also characterized by the following:

A. Educational Achievement: Achievement of not less than a bachelor's degree.
B. Years of experience: not less than (5) years.
C. Most individuals are leaders in their business sector.

The results of the questionnaire showed that about (88%) were holders of bachelor's degree, (8%) were holders of higher diploma, and (4%) were holders of master's degree.

5. RESULTS AND DISCUSSIONS

Through personal interviews with workers, contractors, and legal professionals, the value of the initial compensation was suggested. Disability percentages were chosen using information according to the Ministry of Labor and Social Affairs. The worker is not entitled to compensation if the equipment is available and has not been used .The results of the questionnaire were analyzed statistically using SPSS program and in the result of the answers obtained. The results of the questionnaire are presented in Table 1.

This is illustrated by looking at the value of the standard deviation which was close to (1), which indicates that the dispersion was large with answers.

By comparing the compensation criteria for work injuries at construction sites in Iraq as a result of work accidents, it was found that the compensation standard No. (7) injury to the eyes when the injury lead to a disability rate less than (30%), represents the lowest difference factor, which indicates this criterion The research sample agreed on the above criteria, where the answers were less dispersed and more homogeneous than the other criteria.

By looking at the values of relative importance of the criteria, it was found that the standard No. (27) injury of shoulders and arms when the injury leads to a disability rate of 60% and more and criterion (37) injury a disease when the injury lead to a disability rate less than 30% and criterion (40) Occupational diseases when the incidence of disability is less than 30% and criterion (42) The incidence of occupational diseases when the injury leads to a disability rate of 60% or more, it was found that these criteria are the most important for other criteria from the point of view of the research sample. While the value of the relative importance of criterion (28) injury of wrist and palms when injury leads to a disability rate less than 30%, is less important for other criteria from the point of view of the research sample.

Standard No. (22) Injury of toes when injury leads to a disability rate less than 30%, represents the largest coefficient of difference, which indicates that this criterion is less homogeneous than the rest of the standards, which indicates that the research sample agreed on the above criterion, where the answers were

Table 1
The results of the questionnaire

Rank	Type of injury	Disability ratio	Arithmetic mean (I.D)	standard deviation	Coefficient of variation	Relative importance
1	Head and ears	Less than 30%	1,419,354	0.79108	34.06011	58.065
		(30-60)%	3,225,806	1.02233	42.82728	59.6775
		More than 60%	5,645,161	0.95490	36.5456	65.3225
2	Face	Less than 30%	1,725,806	0.87129	32.54239	66.935
		(30-60)%	3,774,193	0.92283	35.76029	64.5150
		More than 60%	6,225,806	0.85383	29.08636	73.3875
3	Eyes	Less than 30%	2,290,322	0.59749	20.58039	72.58
		(30-60)%	4,596,774	0.67997	23.16369	73.3875
		More than 60%	8,580,645	0.66881	20.73315	80.6450
4	Neck, back, chest and abdomen	Less than 30%	2,048,387	0.80989	33.03516	61.2900
		(30-60)%	4,306,451	0.84497	30.45815	69.3550
		More than 60%	6,661,290	0.81650	27.21667	75.0000
5	Pelvis and thighs	Less than 30%	2,370,967	0.76200	27.46738	69.355
		(30-60)%	4,112,903	0.78288	28.89176	67.7425
		More than 60%	6,838,709	0.99785	33.99251	73.3875
6	Legs and knees	Less than 30%	3,161,290	0.76482	29.63729	64.515
		(30-60)%	4.370.967	0.74919	26.69482	70.1625
		More than 60%	6,661,290	0.83602	28.17064	74.1925
7	Foot and ankle injury	Less than 30%	2,274,193	0.99569	40.08575	62.0975
		(30-60)%	3,983,870	1.05749	43.70877	60.485
		More than 60%	5,564,516	0.99461	39.0288	63.71
8	Toes	Less than 30%	1,403,225	0.99785	48.33374	51.6125
		(30-60)%	3,225,806	0.83344	37.9959	54.8375
		More than 60%	4,870,967	0.95827	39.60775	60.485
9	Shoulders and arms	Less than 30%	2,016,129	0.88961	35.3567	62.9025
		(30-60)%	3,806,451	0.88961	35.3567	62.9025
		More than 60%	5,258,064	0.86385	31.87991	100
10	The wrist and palms	Less than 30%	1,532,258	0.87498	43.05368	50.8075
		(30-60)%	3,177,419	0.82436	35.99354	57.2575
		More than 60%	4,822,580	1.02233	42.82728	59.6775
11	Fingers	Less than 30%	1,048,387	0.89202	43.20756	51.6125
		(30-60)%	3,000,000	0.89202	43.20756	51.6125
		More than 60%	4,790,322	0.96163	38.71452	62.0975
12	the whole body	Less than 30%	2,580,645	0.65418	23.30946	70.1625
		(30-60)%	3,919,354	0.82044	28.90196	70.9675
		More than 60%	9,048,387	0.76200	23.62205	80.645
13	Disease	Less than 30%	1,822,580	0.95827	39.60775	100
		(30-60)%	3,500,000	1.02548	39.73805	64.515
		More than 60%	5,935,483	0.97936	36.57877	66.935
14	Occupational diseases	Less than 30%	2,451,612	0.99244	38.45772	100
		(30-60)%	7,112,903	0.95490	36.5456	65.3225
		More than 60%	6,209,677	0.92166	32.1024	100
15	When it leads to death		17,354,838	0.74632	24.09972	77.42

very scattered and less homogeneous than the other criteria.

After conducting the test of honesty and consistency, we obtained the results shown in Table 2 show the relationship between number items and Alfa Kronbach:

By looking at the value of Alpha Kronbach, the value of the coefficient is 0.978. It is clear that the value is high and close to one and this means that the answers were good and the number of variables was (43) variable.

In order to obtain compensation on a daily basis, the value of financial compensation for injuries sustained by workers as a result of work accidents has been extracted in a manner (working days) and in accordance with the criteria extracted based on the results of the questionnaire, in order to prepare consistent criteria for compensation that can be relied

upon at any time, place, and for all Construction projects in all Iraqi provinces.

Table 2
Relationship between number items and Alfa Kronbach

Number of items	Alfa Kronbach
43	0,978

The researchers has determined the value of the daily wage of the worker approximately (20,000) twenty thousand dinars, and extracted the number of working days that the injured worker is entitled according to the type of injury and the percentage of disability resulting there from as shown in the following Table 3:

Table 3
Values of financial compensation for injuries

Rank	Type of injury	Disability ratio	Arithmetic mean (I.D)	Compensation value (working day)
1	Head and ears	Less than 30%	1,419,354	71
		(30-60)%	3,225,806	162
		More than 60%	5,645,161	283
2	Face	Less than 30%	1,725,806	87
		(30-60)%	3,774,193	189
		More than 60%	6,225,806	312
3	Eyes	Less than 30%	2,290,322	115
		(30-60)%	4,596,774	230
		More than 60%	8,580,645	430
4	Neck, back, chest and abdomen	Less than 30%	2,048,387	103
		(30-60)%	4,306,451	216
		More than 60%	6,661,290	334
5	Pelvis and thighs	Less than 30%	2,370,967	120
		(30-60)%	4,112,903	206
		More than 60%	6,838,709	342
6	Legs and knees	Less than 30%	3,161,290	160
		(30-60)%	4.370.967	220
		More than 60%	6,661,290	334
7	Foot and ankle injury	Less than 30%	2,274,193	114
		(30-60)%	3,983,870	200
		More than 60%	5,564,516	280
8	Toes	Less than 30%	1,403,225	71
		(30-60)%	3,225,806	162
		More than 60%	4,870,967	244
9	Shoulders and arms	Less than 30%	2,016,129	101
		(30-60)%	3,806,451	191
		More than 60%	5,258,064	263
10	The wrist and palms	Less than 30%	1,532,258	77
		(30-60)%	3,177,419	160
		More than 60%	4,822,580	242
11	Fingers	Less than 30%	1,048,387	53
		(30-60)%	3,000,000	150
		More than 60%	4,790,322	240
12	the whole body	Less than 30%	2,580,645	130
		(30-60)%	3,919,354	196
		More than 60%	9,048,387	453
13	Disease	Less than 30%	1,822,580	92
		(30-60)%	3,500,000	175
		More than 60%	5,935,483	297
14	Occupational diseases	Less than 30%	2,451,612	123
		(30-60)%	7,112,903	356
		More than 60%	6,209,677	311
15	When it leads to death		17,354,838	868

6. CONCLUSION

- The absence of a clear system for compensation of work injuries in construction projects and the adoption of compensation on personal jurisprudence and several considerations (regional and tribal) and others.
- Failure to give senior management in construction sites adequate attention to provide personal protection equipment for workers in the workplace.
- Weakness in the contractor's implementation of occupational safety procedures.
- Lack of awareness of workers in the construction sector of the danger of leaving personal protective

equipment in the workplaces and not to benefit from them if available.

- The organizational structure of most construction companies does not contain a section on occupational safety.
- Non to hold meetings or seminars with workers in the work sites to urge them to apply safety precautions.

7. RECOMMENDATIONS

- Use of the compensation system suggested in this research to eliminate all compensation problems.
- Failure to apply the compensation system in case the contractor provides all safety procedures and has not been applied by the user.
- Increasing the awareness of workers in construction sites about the dangers of work and the importance of using personal protective equipment by opening awareness training courses and various audio-visual means.
- Follow-up employers and project managers in maintaining the health and safety of employees, through the submission of daily or weekly reports on the progress of work.
- Adoption of the results of the research by the higher authorities to issue a law by adopting them in estimating the appropriate compensation for each type of work accidents.

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