

Occupational Safety and its Relationship to Workplace Accidents among Civil Protection Officers in the Wilaya of Tizi Ouzou

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Abstract:

Our study aimed to investigate the extent of the relationship between occupational safety and work accidents among civil protection officers in the wilaya of Tizi Ouzou. The intervention officers of the main unit, Tahir Afragn, in the wilaya of Tizi Ouzou were the subject of our study.

We used the descriptive approach in our study, as it is the most appropriate and suitable for such studies, where we highlighted the elements related to occupational safety and work accidents. The study was carried out on a simple random sample of 100 male intervention officers working in daily interventions, using statistical programmes to test the validity of the hypotheses proposed (correlation coefficient and t-test). The results of this study are as follows:

- The study showed that there is a negative relationship between work safety and work accidents among civil protection officers.
- The study statistics showed that there are statistically significant negative differences in occupational safety due to the educational level of civil protection officers in the wilaya of Tizi Ouzou.
- The study statistics showed that there are statistically significant negative differences in occupational safety attributed to the professional experience of civil protection officers in the wilaya of Tizi Ouzou.

Keywords: Occupational safety, Workplace accidents, Civil protection.

1. Introduction:

Since the beginning of life, man has sought to create security and safety. The latter is one of the basic needs at all stages of their lives, especially in this advanced era, where stability and security must be guaranteed in all areas of work, whether moral or material. This is to ensure the stability of social life in all its forms, since human existence depends on work, but also on security and peace.

For this reason, industrial and organisational psychologists and employers have become increasingly interested in safety at work, as it is the real key to rapid

success and development, and to keeping pace with technological progress and modern industries.

In order to enable institutions to achieve their objectives, it is necessary to provide a safe working environment from the risks of various industries and to raise the level of preventive means that will lead to the reduction of these injuries, in order to protect the human element from the risks that threaten it.

According to our limited knowledge of previous local studies, the issue of occupational safety for civil protection workers has not received much attention, especially since the number of major accidents, which require a great deal of work experience and effort, has increased in recent times.

Therefore, it is necessary to look first at the reality of the institutions in the industrial and labour sector, and in the light of these conditions, the institutions work to give the utmost importance to the human element, which is the main pillar for them, since the effectiveness of the latter is measured by the efficiency of the worker and his ability to perform well. It is the first part or element that reflects the image of the institution and translates its policies into actions and results.

For this reason, each institution tries to acquire and provide a set of mechanisms to achieve the peace and balance that motivates the worker and makes him feel calm and secure in the workplace, especially self-confidence and a sense of freedom.

The civil protection profession, due to its unique characteristics and nature, is one of the professions whose practitioners are exposed to work-related accidents. Therefore, our study aims to identify the causes of work-related accidents among civil protection personnel and to provide them with assistance in order to achieve safety and security for the community. As a result of the active role of civil protection personnel, they are constantly exposed to occupational accidents, which many of them try to avoid by taking scientific and environmental precautions to ensure their safety from any potential danger.

This profession exposes its practitioners to accidents with different causes and contributing factors, as well as to the environment in which they operate, all of which cause psychological and physical problems, a sense of danger, injuries or disabilities.

In this respect, the civil protection sector is one of the institutions that play an important role in protecting citizens and ensuring their well-being, and it is indispensable in any society, as it is one of the structures that reflect society's sophistication, progress and awareness with regard to occupational hazards and disasters. Therefore, the study of this profession and the attempt to uncover the occupational accidents to which civil protection personnel are exposed has become an essential necessity in order to meet the requirements of this profession, providing the appropriate environment for this group to perform their duties to the fullest and ensuring the provision of assistance and rescue to citizens at all times.

Although there are a number of factors that contribute to accidents at work among civil protection personnel, this is primarily due to the nature of the profession and the various duties and responsibilities assigned to them.

Although this profession has been described as a high-risk one, it can be affirmed that although civil protection personnel are more exposed to accidents than any other workers, they perform their duties with competence and dedication, considering their work as primarily humanitarian.

The aim of our study is therefore to shed light on occupational safety and its relationship with accidents at work in the Directorate-General for Civil Protection.

The study problem:

The issue of occupational safety has attracted the attention of many international and national organisations and institutions, as well as various sectors such as the professional, transport, tourism and shipping industries, among others. This attention stems from the urgent need to eliminate the risks that threaten people, nature and property, as these risks are often caused by human ignorance and negligence. Therefore, raising awareness of harmful and incorrect behaviours, as well as identifying sources of danger and ways to deal with them, is one way to reduce or eliminate these risks.

The growing need for safety and security has given rise to a number of academic disciplines, particularly in the fields of transport, intellectual and occupational safety. These disciplines have expanded to encompass all material and non-material human achievements, to the extent that they have become a way of life, manifested in various practices on the road, in the marketplace and at work. Ergonomics and the psychology of work and organisation deal with the issue of safety at work in isolation from the culture of the outside world and the culture of the organisation, because the individual is constantly exposed to the risks of accidents at work and occupational diseases, despite the existence of prevention and safety committees in the organisation and their efforts to train and educate workers. Perhaps the reason for this is negligence and the lack of building a positive safety culture within the organisation.

Occupational safety is seen as an act that accompanies the individual in his or her daily life, since it is influenced by a series of cultural, organisational or even social factors. The subject of safety at work has been confined to new studies and techniques, especially with the technological development in all areas of daily life, which considers preventive instructions and guidelines as dry rules and movements that are sufficient to teach workers or trainees to technically deal with risks or colleagues to avoid injuries or dangers, similar to the psychology of work and organisation and ergonomics, which sees that commitment to the culture of occupational safety programs is inevitable and necessary for every worker, as it is the primary resource and the basic pillar on which organisations and institutions are based to achieve their goals and keep pace with the wheel of competition and development.

This competition and development itself can cause stress and anxiety among workers, which can lead to non-compliance with occupational safety rules and guidelines in the workplace. Data and statistics are the ones that translate the reality of the extent of workers' commitment to occupational safety programmes. According to the International Labour Organisation, more than 23 million people die each year worldwide as a result of work-related accidents and occupations. In addition, around 860,000 people are injured in workplace accidents. At the national level, the National Institute for the Prevention of Occupational Risks in Algeria (INPRP) recorded approximately 50,000 work accidents per year in various sectors, with an average of 750 to 850 specific work accidents between 2000 and 2019, compared to 2018, when 48,000 work accidents were recorded, including 529 fatal work accidents.(Tayeb.2018)

The newspaper Echorouk Online reported that tens of thousands of Algerian workers die each year in work-related accidents and at least 500 cases of work-related illness. These figures and statistics provide a glimpse of the alarmingly high rates of occupational accidents, which, in addition to the human (deaths, disabilities, psychological trauma) and material (equipment, machinery, infrastructure) losses, are a major concern for employers and national ministries of social security, health and labour.

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In order to prevent these problems, the International Labour Organisation (ILO) has established strict laws and conventions, such as

- Convention No. 31 of 1929 concerning the Prevention of Industrial Accidents
- Convention No. 97 of 1997 on the Protection of Workers and the Working Environment, which requires employers to provide adequate physical and environmental conditions.
- Convention No. 119 of 1963 on the Guarding of Machinery, which prohibits the manufacture, sale, rental and use of machinery without adequate safety devices.

(International Labour Organisation)

Moreover, Law No. 08-07 of 26 January 1988 on health prevention, safety and occupational medicine, published in the Official Journal of Algeria (1984), dealt with the means and methods to be adopted in order to ensure the best conditions in the field of prevention, health, safety and occupational medicine for the benefit of workers, as well as the identification of the competent authorities.

In addition, the National Institute for the Prevention of Occupational Risks was set up by Decree No. 2000-253 of 23 August 2000, as amended and

supplemented by Decree No. 20-08 of 20 April 2000. This institute aims to prevent occupational risks and to supervise all activities related to the promotion and improvement of health and safety conditions at work, as well as to carry out research, development, training, information and awareness-raising in the field of occupational risk prevention, under the supervision of the Ministry of Labour, Employment and Social Security. It is an industrial and commercial organisation, with legal personality and financial independence, whose mission is to carry out, at the request of the public authorities or any public or private institution or organisation, specialised studies for the public good and general interest. It also carries out, on behalf of companies, the improvement of working conditions in terms of health in the workplace (training, technical expertise, technical studies and the achievement of quality, environmental health and safety, and support for various certifications).

The psychology of work, organisation and human resources management has become a major focus of attention and all the research and studies have made occupational health and safety a vital and contemporary subject, in line with scientific and technological progress and the development of critical areas of life. The worker is accompanied and efforts are made to find ways and means to contribute to safety, high performance, occupational safety, job satisfaction and job security, in collaboration with various other disciplines such as management, ergonomics, medicine, clinical psychology, management and many other sciences that spare no effort to provide new developments for the purpose of improving, developing and preparing the necessary working conditions.

In a recent study by Abderrazeq Hamer El-Ayn on the level of workers' perception of occupational safety practices and its relationship to occupational accidents at the "El-Katamia for Cork" facility in Jijel, the study was conducted on a sample of 80 workers. The study confirmed that the level of workers' perception of occupational safety practices is low, and that there are statistically significant differences in the mean responses of workers regarding occupational safety practices due to the gender variable, and no statistically significant differences in their responses regarding occupational safety practices due to the seniority variable. The study also found a statistically significant relationship between workers' perceptions of occupational safety practices and occupational accidents in the organisation. (Hamer El-Ayn, 2022)

Mouchali Bilal's study on occupational safety programmes in improving the performance of workers in Algerian small and medium enterprises aimed to determine the extent to which occupational safety programmes contribute to improving the performance of workers in Algerian small and medium enterprises. The study found that the importance of implementing occupational safety programmes and their role in preventing occupational accidents in Algerian small and medium enterprises is significant. The study concluded that the percentage of workers exposed to work-related accidents is high and that

poor working conditions are the main causes of work-related accidents. However, most workers confirm that it is possible to avoid all the causes of accidents at work. The study also highlighted that the institution is somewhat negligent in implementing occupational safety programmes, which workers attribute to the lack of concern of officials. (Mouchali, 2011)

The study by Al-Abbasi Brouji and Mubarak Boukhafes on the attitudes of workers towards the use of personal protective and safety equipment in the Mechanical Industries Establishment in Wadi Rihou, based on a random sample of 93 workers, showed that the attitudes of workers towards the use of personal protective and safety equipment were predominantly neutral and negative, with 40.9% negative reception and 38.7% neutral attitude, while 20.4% had a positive attitude towards the use of personal protective and safety equipment. (Brouji and Boukhafes, 2014)

The study conducted by Oumaima Sakr on the reality of occupational health and safety measures in the manufacturing companies in the Gaza Strip (the study aimed to identify the reality of the manufacturing companies in the Gaza Strip) confirms that there is a statistically significant correlation between the effectiveness of occupational health and safety procedures and the commitment to implement, provide and develop the systems and laws related to occupational health and safety at the level of regulatory and industrial institutions. In addition, there is a statistically significant relationship between the level of qualification at the level of regulatory and industrial institutions and the effectiveness of occupational safety procedures. The study also revealed that industrial companies do not pay enough attention to the preparation of special reports on occupational accidents. (Sakr, 2007)

The study by Nath Sen & Yeow on productivity, quality and occupational health in America, based on a sample of 30 factories, found that training workers in the proper use of occupational safety tools helps reduce accidents and achieve safety, and the presence of an occupational safety officer is necessary, as are other safety measures and reducing the number of workers without the necessary job skills. (Nath Sen & Yeow, 2003)

Based on the previous information, it is clear that despite the technological development witnessed by countries around the world and the efforts made to achieve well-being and occupational health in the work environment, whether in developed or developing countries, and in affirmation of those interested in the field of industrial and organizational psychology and their efforts to implement occupational safety programs and know the extent of workers' attitudes towards the application of these programs and how to train them in institutions, the Algerian national organisations, we have chosen the profession of civil protection, which is considered a humanitarian profession in our society, whose individuals try to lend a helping hand to the entire community in order to achieve safety and security for civil society.

By virtue of their role, civil protection personnel are exposed to occupational hazards that many would prefer to avoid. The nature of their work is inherently risky and their interventions require scientific, practical and environmental precautions to ensure the safety of citizens and property from any foreseeable danger. Although the Directorate of Civil Protection provides many difficult and service-oriented services to its employees and trains its agents and officers in individual and collective safety and preventive procedures, including their enrolment in the Civil Protection Corps and their training in preventive measures and occupational safety, the training programmes for the civil protection professions as agents are not limited to fire-fighting or rescue programmes, but focus primarily on occupational safety and health.

Despite the richness of the training programme, especially in the field of occupational safety and prevention, many occupational accidents have been recorded among the members of this sector.

This is why this study was carried out to examine the reality of the application of occupational safety programmes in one of the civil protection units spread over the national territory, namely the main civil protection unit of the Tizi Ouzou wilaya. The latter has a large geographical area for daily operations and its mountainous and rugged terrain makes the mission of first aid, rescue and fire-fighting difficult and exposes its agents and officers to many unexpected dangers, which are sometimes the cause of accidents.

Accordingly, the problem of the study is expressed in the following questions

- Is there a statistically significant relationship between occupational safety and work accidents among civil protection agents in the main unit in Tizi Ouzou wilaya?
- Are there statistically significant differences in occupational safety according to the variable of professional experience among the civil protection agents in the main unit of Tizi Ouzou wilaya?
- Are there statistically significant differences in terms of occupational safety among the civil protection agents in the main unit in the wilaya Tizi Ouzou according to the variable of educational level?

Hypotheses of the study:

- There is a statistically significant relationship between occupational safety and work accidents among the civil protection agents in the main unit in Tizi Ouzou wilaya.
- There are statistically significant differences in occupational safety due to the variable of professional experience among civil protection agents in the main unit in Tizi Ouzou wilaya.

- There are statistically significant differences regarding occupational safety due to the variable of educational level among the civil protection agents in the main unit in Tizi Ouzou wilaya.

Importance of the study:

- It deals with one of the important and sensitive issues that is the occupational safety programmes.

- Identifying the occupational safety conditions within the organisation to show the extent of availability of occupational safety and security for the agents.

- The importance of the type of protection provided, as the occupational safety programmes aim to adapt the worker to his work in a suitable and appropriate environment, providing a better working environment away from the causes of accidents, injuries, hazards and physical and psychological occupational diseases.

- The main aim is to protect workers from the risk of injury and to protect the organisation from any damage, and on the other hand to encourage workers to develop preventive methods and to protect them from dangerous situations during their work, leading to the provision of the best services in the best way and most effectively.

- Attempt to cover all aspects of occupational health and safety.

- To identify the relationship between health and safety programmes and accidents at work, and to modify unsuitable programmes.

- The contribution of the study to the enrichment of information in the field of occupational health and safety and to the addition of new scientific information to the systems and procedures for the prevention and safety of civil protection events.

- The study helps to derive procedural programmes and rules in accordance with the material and human capabilities of civil protection units.

Study Objectives:

Every study has a set of objectives that it seeks to achieve and the objectives of this study include:

- To determine the importance of occupational safety programmes.

- To determine the importance of occupational prevention and safety methods.

- Provide qualitative information to decision-makers in the institution about the type of programmes that help to increase safety in the workplace.

- To increase the knowledge and change the behaviour of workers, and to make subordinates aware of the need for awareness and the potential consequences of any disregard for the application of occupational safety programmes.

- Provide suggestions and recommendations to help solve the problems faced by some of the units involved in occupational safety in the Civil Protection Unit.

- To disseminate a culture of positive awareness by adhering to the principles of prevention, protection and occupational safety programmes.

2. Operational definition of the study terms:

- **Occupational safety:** What the Wilaya Directorate of Civil Protection in Tizi Ouzou aims to achieve by implementing special procedures to increase the value of workers' health and safety and maintain the rates of work accidents and occupational diseases.

- **Occupational accidents:** Any unexpected act by civil protection agents that takes on an accidental nature, causing damage to the worker and the institution together, and that occurs for internal or external reasons, leaving material losses, such as damage to equipment, and moral losses, such as the death of the worker.

- **Civil protection personnel:** The employees belonging to the Civil Protection Corps in the wilaya of Tizi Ouzou, working in the main Civil Protection Unit (Taher Ifrougan), whose mission is to protect citizens, property, animals and the environment, and to provide their services of first aid, rescue and firefighting 24 hours a day, days and months.

3. Field of study:

3.1 Duration of the study:

Our field study was conducted in two phases:

- Phase 1: We conducted a preliminary study in the period between 1 September 2023 and 8 September 2023, which allowed us to become familiar with the unit and get closer to its agents and employees, and consequently collect preliminary information about the sample and confirm the psychometric characteristics of the data collection tools.

- Phase 2: We conducted the main study, where the questionnaire and scales were distributed to the study sample on 11 September 2023, and then we retrieved them on 15 September 2023.

3.2 Introduction to the main unit - Taher Ifrougan:

Our study was conducted in the civil protection sector unit called Taher Ifrougan, located on the eastern side of the wilaya (province) capital of Tizi Ouzou, specifically at its eastern exit on National Road No. 12 on the street called Chaâban Hassan, where it occupies an area of 1.5 hectares. It is bordered to the north by the N12, to the west by a bedding factory and a petrol station, to the east by a wage factory and to the south by a side road off the N12. This unit was created in 1970 under the name of the Central Unit of Civil Protection of the Wilaya of Tizi Ouzou. It employs around 250 people, 50 of whom are administrative staff and the rest are agents of various ranks. Their mission is to intervene and they are divided into three teams, A, B and C, which ensure intervention at sector level 24 hours a day.

3.3 Research methodology:

Each phenomenon has a specific methodology that corresponds to the nature of its composition, and a particular phenomenon or problem may require the researcher to apply a particular methodology over others. Since the subject of this study is occupational safety and its relationship to work accidents among workers, it is a form of describing the current situation within the institution.

Therefore, the most appropriate methodology for this type of study is the descriptive approach, as it is consistent with the nature of the research topic and the objectives we are trying to achieve. By descriptive methodology, we mean the approach based on describing the phenomenon under study in detail, studying all its qualitative and quantitative aspects, expressing its features and characteristics, its size, its impact and the extent of its relationship with other phenomena. (Al-Anddour, 2010)

3.4 Study population and sample:

The process of selecting the sample is one of the fundamental stages in any scientific research, as the choice of the sample depends on the nature of the variables being studied. The sample is defined as a subset of the individuals, observations or phenomena that make up the original study population. Rather than conducting research on the entire population, we select a portion of these elements in a particular way. (Obaidat et al., 1999)

In our study, the research population represents the workers of the main unit of Thaer Afroujn in Tizi Ouzou, estimated at 250 workers, including the administrative staff, the workshop, the general warehouse, the communication and coordination centre and the intervention agents. A preliminary study was carried out on a sample of 30 male intervention agents only, using the original version of the study tool. Then, 100 agents were randomly and simply selected from the 250 excluded from the original study, in order to examine their psychometric properties in terms of reliability and validity, and what distinguishes them in terms of some reliability and validity factors.

The characteristics of the study sample are as follows:

3.4.1 Characteristics of sample individuals according to age:

Table (01) shows the distribution of sample individuals according to the variable age

Distribution	Frequency	Percentage %
Age		
Less than 30 years	06	06%
From 30 to 39 years	60	60%
From 40 to 50 years	30	30%
50 years and above	04	04%
Total	100	100%

Table (01), which shows the distribution of the sample by age, shows that 6% of the sample is under 30 years old. Then we find that the percentage of those aged 30 to 39 is estimated at 60%, while the percentage of those aged 40 to 49 is estimated at 30%. We can also see that the percentage of those aged over 50 is around 4%.

3.4.2 Characteristics of the sample by marital status:

Table (02) shows the distribution of sample persons according to the variable marital status.

Distribution Marital Status	Frequency	Percentage %
Single	45	45%
Married	55	55%
Total	100	100%

Table (02) on marital status shows that 58% of the sample are married, while the percentage of single persons is estimated at 45%.

3.4.3 Characteristics of the respondents by age:

Table (03) shows the distribution of sample persons according to the variable of seniority.

Distribution Age	Frequency	Percentage %
Less than 05 years	08	08%
From 05 to 10 years	43	43%
From 11 to 15 years	37	37%
21 years and above	12	12%
Total	100	100%

Table (03) shows the years of experience in the workplace, where 43% have experience between 5 and 10 years, while 37% have experience between 11 and 15 years. In addition, 12% have 21 years or more of experience, while 8% have less than 5 years of experience.

3.5 Data collection tools:

3.5.1 Observation:

The technique of observation was first used in our exploratory study, which helped us to gain a preliminary understanding of the study site. This is because observation is an important means of data collection and a fundamental source for obtaining direct information about the subject. It relies on the researcher's senses and ability to translate observations into meaningful phrases and expressions. Observation played an important role in the study, especially in the interactions with the workers, as it helped us to uncover the conditions in which they work.

During our presence in the field, we observed the high level of discipline, vitality and activity of the civil protection workers. We had the opportunity to immerse ourselves in the wonderful atmosphere that prevailed within the unit. At the beginning of the shift, the national flag is raised with great patriotism, after a meeting between the two rotating teams to exchange instructions for the next 24 hours. After the national colours have been raised and saluted, the working team is allowed to leave and the team for the day takes over. Attendance and absences are then recorded and roles and tasks are assigned to

the agents, with some responsible for the ambulance, others for the fire engine or rescue, and others for general cleaning within the unit.

After the meeting, each member goes to inspect the equipment with which he works. The driver checks the engine of the lorry or ambulance and tests its operational readiness in the best conditions. If he finds any malfunction or defect, he must inform the team leader, the team leader and the duty officer.

For their part, the agents check their personal protective equipment (helmet, gloves, leather coat) and other equipment such as self-contained breathing apparatus and collective protective equipment such as the cordon used in traffic accidents. The civil protection agents provided us with information on all the equipment, such as the first aid kit and the fall arrest equipment, as well as the tools for dismantling, cutting, towing and stabilisation, and the correct professional techniques for using them in compliance with occupational health and safety standards.

Agents also shared information about their work to enrich our research. One agent stated that the nature of the work itself contributes to work-related or road traffic accidents and that a high percentage of us may also be exposed to such incidents, given the hazards at the accident site, despite our compliance with occupational safety standards. Another agent shared a statement about an incident in 2014 in which a colleague was injured when a passenger bus with a brake failure almost cost him his life.

We noticed the attention the agents paid to their uniform appearance and cleanliness, as well as the smiles on their faces. We also noticed the group spirit and the excellent communication between individuals, with an exchange of experiences where everyone listens and gives advice, despite differences in training levels and seniority. They all contribute to creating an educational and sometimes recreational atmosphere among themselves.

As we entered the employees' club, we saw signs and posters relating to work situations and health and safety rules, as well as pictures of some of the employees who had lost their lives while carrying out their noble duties.

3.5.2 The interview:

The interview is a direct technique used to question individuals collectively or individually in order to obtain information or data that can only be accessed through sustained interaction with some officials and workers.

According to researchers Mohamed Daoudi and Boufetatt, the interview is a direct confrontation between the researcher and the respondent, the purpose of which is to collect specific data about an individual or group for use in scientific study.

During our study, after obtaining the permission of the unit commander, Captain B.A., and the information officer of the Civil Protection Directorate in the province of Tizi Ouzou, Captain K.B., we had the honour of interviewing each of them and were allowed to collect information from them. Despite their busy schedules, the interviews took place in an excellent atmosphere.

The first interview: with the unit commander, Captain B.A.

- Captain, what safety procedures are followed during your daily operations?
- The officer: The officer's first responsibility is to protect himself with his personal equipment, then his colleagues and the team he is working with, and finally the victim and the site, using all available means.
- Sir, do the officers respect the safety procedures?
- The President: Of course, they are obliged to do so, and even the law specific to the officer corps punishes violators of these measures, as well as the social security system, which does not compensate individuals who have not respected the standards.
- Captain, have your officers been exposed to occupational accidents and what are the reasons for this?
- The President: Yes, of course, since the nature of the work is to intervene in order to protect the citizens and provide them with first aid and assistance, the officers are exposed to risks. There are many reasons for this: first of all, the physical conditions in the field, such as high temperatures, lack of lighting during night operations, natural disasters - in the summer of 2021, fires ravaged everything - and the difficult terrain of the Kabylia region, which is mostly mountainous, has also caused many accidents for our officers, such as burns, suffocation, swelling, fractures and wounds. There are also many uncontrollable factors.

The second interview: The Information and Communication Officer of the Civil Protection Directorate of Tizi Ouzou Province, Captain K.B.

- Captain, what are the awareness programmes for the officers who intervene in the various incidents?
- Captain: First of all, the officers are trained in individual and collective prevention and protection procedures during their training. In addition, our Directorate tries to constantly remind them of the obligatory application of these procedures, through training courses as well as instructional posters.
- What procedures do you follow when your personnel is involved in an accident at work?
- Captain: First of all, we look after the officer and make sure he has all the necessary resources at his disposal. Then we evaluate the accident with the regulatory authorities and the social security system in order to compensate and rehabilitate them.
- What are the consequences if a member of staff suffers an accident at work?
- Captain: Hearing the word "accident" has a moral effect on the officer's psyche, as everyone is affected and the motivation to perform sometimes decreases for some individuals. Not to mention the material losses caused by the damage to equipment and the gloomy atmosphere in the working environment. Accidents at work therefore have an impact at various levels - individual, social and economic.

3.6 The questionnaire:

The questionnaire is one of the most commonly used research tools. It is used to collect as much data as possible about individuals and to express their opinions and feelings about the subject of the study.

3.6.1 Questionnaire design:

The questionnaire was designed on the basis of the studies we reviewed on occupational safety and work accidents in general, as well as what we observed in the main civil protection unit in the province of Tizi Ouzou, in addition to the interviews we conducted with individuals who perform their duties in this unit. In designing the current questionnaire, we took into account the following aspects

Closed-ended questions, each with three levels of response, from completely positive to completely negative, and the respondent is asked to select only one option. Some are compound and contain sub-questions, but the respondent is asked to choose one option for each sub-question. Closed questions were used to

- Overcome respondents' language problems
- Require less time to answer
- Require less time for analysis

The final questionnaire was structured as follows

- The introduction providing information about who we are, what we do and what is required of the respondent.
- Questions relating to the individual's own data: age, level of education, years of experience in the current job, items 1 to 3.
- Questions related to safety at work, items 4 to 26.
- Questions on accidents at work, items 27 to 45.

3.6.2 Face validity of the questionnaire:

We presented this first version of the questionnaire to a group of 5 judges selected from specialised professors in order to ensure the validity of the study tool. They were asked to give their opinion on the clarity of the statements in the questionnaire, the appropriateness of the statements to the themes to which they belong, and the importance of the statements in measuring what they were intended to measure. In addition, they were asked to make any changes to the wording of these statements, to add to them or to make any observations that could contribute to the development of the study tool. On the basis of the guidance they provided, we made the adjustments they suggested.

3. Psychometric Properties of the Study Questionnaire:

3.7.1 Validity:

Table (04) shows the construct validity of the questionnaire.

Statement	Correlation coefficient	Value (Sig)
Occupational Safety	0.988**	0.000
Work Accidents	0.637**	0.000

The results of the table show that the correlation coefficients of the questionnaire dimensions are all high and statistically significant at the 0.01 level of significance. Therefore, they have a very high level of validity.

3.7.2 Reliability:

Table (05) shows the Cronbach's alpha values for the questionnaire.

From the above table we can see that the Cronbach's alpha coefficient reached a value of 0.938. These results show the stability of the questionnaire.

The questionnaire as a whole	Items' number	Cronbach's alpha coefficient
	42	0.938

3.8 Statistical methods used:

In our study we used the following statistical methods:

We calculated percentages, means, f sig - Ttest, Pearson correlation coefficient, Cronbach's alpha coefficient, construct validity, and to verify different hypotheses we used the statistical software known as SPSS 21.

4. Analysis, interpretation and discussion of the results of the study:

4.1 Presentation and analysis of the results of the first hypothesis:

To determine the relationship between occupational safety and work accidents, we used the Pearson correlation coefficient.

Table (06) shows the results of the test of the first hypothesis.

Sample size	Hypothesis variables	Pearson correlation coefficient	Statistical significance	Significance level	Statistical decision
100	Occupational Safety	-0.543**	0.000	0.01	Statistical significant
	Work Accidents				

From Table (06), it can be seen that the Pearson correlation coefficient reached a value of $**-0.543$, while the significance level value is 0.000, which is less than the assumed significance level of 0.01. Therefore, there is a negative relationship between work safety and work accidents among civil protection agents.

The hypothesis that there is a relationship between occupational safety and work accidents among civil protection agents has not been verified because the Directorate of Civil Protection attaches great importance to the field of occupational safety for its agents. The agent is obliged to take individual and collective preventive measures, especially during interventions. In addition, the Directorate provides all the necessary conditions and resources to ensure safety at work, and has also introduced strict laws that punish anyone who does not apply or violates the rules of safety at work.

4.2 Presentation and analysis of the results of the second hypothesis:

Table (07) shows the results of testing the second hypothesis.

Education level	Number of individuals	Mean	Standard deviation	F value	SIG value	Significance Level
Middle	25	55.32	13.71	1.319	0.272	0.05
Secondary	55	56.23	13.96			
University	20	61.00	5.02			
Total	100	56.96	12.69			

From table (07) it can be seen that the probability value (sig), which is equal to 0.736, is greater than the significance level (0.05). Consequently, there are no statistically significant differences in terms of occupational safety among civil protection agents that can be attributed to their level of education.

Therefore, the hypothesis that there are statistically significant differences in occupational safety among civil protection agents that can be attributed to the level of education has not been verified. This is because the procedures and rules of safety at work do not require a specific level of education, but rather a high level of concentration and attention during interventions.

4.3 Presentation and analysis of the results of the third hypothesis:

Table (08) shows the results of the test of the third hypothesis.

Level	Number of individuals	Mean	Standard deviation	F value	Sig value
Less than 5 years	08	37.62	4.17	2.474	0.066
5 to 9 years	43	41.27	3.16		
10 to 14 years	37	41.00	3.62		
15 years and above	12	40.25	4.47		
Total	100	40.76	3.66		

Based on the information provided in Table (08), the following can be observed: The probability value (sig) is 0.066, which is greater than the significance level (0.05). Therefore, there are no statistically significant differences regarding occupational safety among civil protection agents that can be attributed to professional experience.

Accordingly, the hypothesis stating that there are statistically significant differences regarding occupational safety among civil protection agents that can be attributed to professional experience has not been verified. This is because despite the variation and difference in the number of years of experience among the agents, the factor of positive interaction and coordination between those with more seniority and those with less seniority has resulted in an exchange of experiences and recommendations.

5. Discussion and interpretation of the study results:

5.1 Discussion and interpretation of the results of the first hypothesis:

The results obtained and the table show that there is a negative correlation between safety at work and accidents at work.

The results obtained, based on the Pearson correlation coefficient estimated at -0.543, with a significance level of 0.000, which is lower than the assumed significance level of 0.01, confirm the hypothesis that there is a relationship between occupational safety and work accidents.

The results of this hypothesis are interpreted that the Civil Protection and its Directorate supervise the implementation of occupational safety programmes through their various units in their environment, as well as outside the organisation at the intervention sites for their agents through training and education, as well as for citizens through awareness and sensitisation campaigns. However, despite the compliance and strict implementation of the occupational safety programmes by the civil protection agents, accidents still occur, as there are deterrent laws and penalties for agents who violate occupational safety rules. The occurrence of accidents is attributed to several reasons, such as the risky nature of the work, the fact that civil protection personnel are on the front line in the face of dangers such as fires, traffic accidents and natural disasters, which exposes them to accidents, the need for speed in interventions, which sometimes makes it difficult to control certain difficulties they face in their daily interventions, as well as the pressure or constraints in the work environment, as well as the pressures or constraints of the operations and the physical conditions such as heat, humidity and wind, and even the human element such as the curiosity of people and their congregation around the accident site, all of which contribute greatly to the agents making mistakes that lead to work accidents. In addition, some of the protective equipment does not fit the workers properly, and the quality and durability of this equipment is also a factor.

In addition, we also find that trucks and ambulances have mechanical defects or are difficult to control, especially in adverse weather conditions such as heavy rain and frost, all of which contribute to the involvement of workers in occupational accidents.

The results of our study are consistent with the results of a study by Qouider (2009), which found that training in industrial safety contributes to the prevention of occupational accidents and diseases, and that the development of preventive awareness methods in the field of industrial safety contributes to the prevention of injuries, occupational accidents and diseases.

The results of our study also agree with the results of a study by Omaima Sakr El-Madi (2007), which found that there is a statistically significant correlation between the effectiveness of occupational safety procedures and the commitment to the implementation, provision and development of occupational

safety systems, regulations and laws at the level of supervisory and industrial institutions.

5.2 Discussion and interpretation of the results of the second hypothesis:

From the results we obtained through Table (07), it is clear that there are no differences between occupational safety and the educational level of civil protection agents, where the results showed that the probability value equal to 0.0736 is greater than the significance level of 0.05, so the hypothesis that there is a relationship between occupational safety and the educational level variable among civil protection agents was not verified.

The results of this hypothesis are interpreted to mean that the level of education, since most agents have a secondary education level, which is not bad, and that joining the ranks of civil protection in the rank of agent requires a secondary education level and does not require a high level or higher degrees, since the occupational safety programs have a set of individual and collective procedures that they are trained in during internships and training, and we also find recommendations in the form of very simplified and understandable guiding awareness images that do not require a high level of education.

For example, wearing a leather coat, helmet and gloves when extinguishing fires, or wearing masks and surgical gloves when assisting victims in ambulances after accidents or natural disasters.

Knowing the methods and techniques for lifting, transporting and administering first aid to victims without harming themselves or using intervention equipment. In addition, the nature of the work does not require a language level to be able to communicate with civil protection personnel when carrying out their work.

Our study agrees with the study by Dif Khadoudja entitled “Preventive Awareness among Workers and its Relationship to Occupational Accidents in Algerian Industrial Institutions”. The results of this study showed that there are statistically significant differences between the various items according to the axis related to occupational accidents due to personal and organisational reasons not related to preventive awareness activities, but rather related to the factor of chance. This is because the activities carried out at job level involve several risks to which workers are exposed once in every three practices.

In addition, Casey’s study “Factors Affecting Occupational Accidents: A Field Study in Public Establishments for Glass and Ceramic Manufacturing”, the factors influencing accidents at work, from the perspective of people who have had accidents at work that led to their injury and who are still working, were classified into four main groups:

- The first group includes factors related to individual characteristics.
- The second group includes organisational factors.
- The third group deals with factors related to the physical work environment.
- The fourth group included mechanical or technological factors.

After analysing this study, it was found that there was no direct relationship between it and the subject of our study, as it specialised in the factors influencing work accidents.

5.3 Discussion and interpretation of the results of the third hypothesis:

The results presented in Table (08) indicate that there are no differences between the variables of occupational safety and professional experience among disaster response officers. The results showed that the probability value sig, which is equal to 0.066, is greater than the significance level of 0.05. Therefore, the hypothesis has not been verified and there is no relationship between occupational safety and professional experience among civil protection agents.

This is explained by the fact that the professional experience of civil protection agents is manifested in the wide knowledge of the field and in the ways of dealing with the daily interventions carried out by the agents, since these are not similar and differ from one intervention to another, which requires the adoption of different plans and methods in accordance with the current and urgent situations. This is because the differences in the interventions, especially in some cases in situations such as firefighting in different terrains and weather changes such as wind direction and speed, make the tasks of civil protection agents more difficult and dangerous, exposing them to more work accidents, despite their compliance with occupational safety conditions.

Our study is consistent with Max Weber's study of human and physical organisational conditions and their relationship to industrial accidents, which examined the physical conditions and human relationships between superiors and subordinates and their relationship to industrial accidents. He concluded that these variables play an important role in creating safety and security procedures for performing work, especially those related to the machines and equipment used in industrial organisations. This study highlighted the great interest in work accidents, which led to his initial concern with inadequate physical conditions, which are considered the main cause of these risks and accidents, but they have multiplied to include variables that can lead to accidents, such as the age factor, experience, visual acuity, psychological factors, and others.

Well, There is another study that agrees with our study, which is the study by Steve (1991) in England entitled "Injuries and Occupational Health in the Chemical Industry". The aim of this study was to examine the case of workers who were exposed to injuries in chemical industry plants in England. The results showed that the majority of industrial accidents are the result of the behaviour of the workers, through the commission of operational or process errors, and as a result of their neglect of health and safety instructions. This makes any workplace-related measures of little value as accidents are linked to personal factors.

6. Conclusion:

The topic of occupational safety and work accidents is considered one of the most important topics that researchers try to study in order to gain a better understanding of it and to create safer safety programmes and procedures, as well as to identify the causes and factors of the occurrence of work accidents. Through this study, we have attempted to explore the relationship between occupational safety and work accidents among the civil protection agents of the Tizi-Ouzou wilaya, at the headquarters of Taher Afrogun. The civil protection profession is one of the most dangerous professions, exposed to natural disasters, and is the first line of intervention in the event of occupational accidents to protect people, animals and property, with all the determination, will and dedication of their noble mission.

Accordingly, our study examined the relationship between occupational safety and work accidents among the civil protection agents of the Tizi-Ouzou wilaya at the Taher Afrogun unit, where a sample of 30 agents was randomly selected, divided into the three shifts (A, B, C) to ensure their 24/7 service, as a pilot study within the methodology of scientific studies. As for the main study, we used a sample of 100 agents, also randomly distributed among the three intervention teams and including only male personnel.

After distributing the questionnaires, collecting some opinions and statements from some agents, exchanging information with the parties involved and collecting the data, which we processed using the statistical software package, we extracted the frequencies, means, percentages, Pearson's correlation coefficient and Cronbach's alpha coefficient to calculate the reliability, as well as presenting, interpreting and discussing them in the light of the results of previous studies. The following results were obtained:

- There is a statistically significant negative relationship between occupational safety and work-related accidents among civil protection agents in the province of Tizi Ouzou.
- There are no statistically significant differences in occupational safety related to the variable of educational level among civil protection agents in the province of Tizi Ouzou.
- There are no statistically significant differences in occupational safety related to the variable of professional experience among civil protection agents in the province of Tizi Ouzou.

Finally, we conclude that occupational safety is related to work-related accidents among civil protection agents in the province of Tizi Ouzou, and that the accidents and injuries to which agents are exposed during the performance of their duties are due to factors and conditions beyond their control and cannot be managed.

Accordingly, and in the context of improving the quality of work and protecting civil protection personnel from, or at least partially reducing, work-related accidents, we have proposed some measures that we hope will contribute to

improving working conditions and protecting individuals, institutions, the economy and others. The proposed measures are:

- Establish more effective awareness programmes that keep pace with technological advances through education and training.
- Provide quality protective equipment that meets internationally recognised occupational safety standards.
- Provide medical and moral support to those injured in work-related accidents.
- Carrying out regular inspections of work equipment, such as ambulances and trucks, and repairing defects in a timely manner.
- Keeping up with the times through new and advanced techniques in the daily operations of civil protection personnel.
- Providing moral support, especially psychological support, to people who have experienced incidents involving their colleagues at work.
- Providing means for rest and relaxation, especially for intervention agents, due to the exhausting and tiring work they perform to cover the 24-hour work schedule.

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