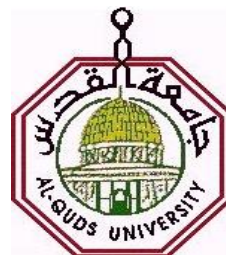


**Deanship of Graduate Studies
Al-Quds University**



**Assessment of the Occupational Safety and Health Standards in
the Vocational Training Centers in Gaza Governorates**

Submitted by

Manar Ahmad Hamad

MPH Thesis

Jerusalem – Palestine

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**Deanship of Graduate Studies
Al-Quds University**



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the Vocational Training Centers in Gaza Governorates**

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Thesis Approval

Assessment of the Occupational Safety and Health Standards in the Vocational Training Centers in Gaza Governorates

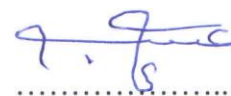
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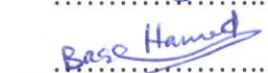
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قال تعالى:

" يا أيها الذين آمنوا اتقوا الله و لتنظرن أنفس ما قدمت لعد " (الحشر: من الآية 18)

و قال تعالى:

"وأن هذا صراطي مستقيماً فاتبعوه و لا تتبعوا السبل فتفرق بكم عن سبيله"

(الأنعام: من الآية 153)

و قال تعالى:

"أفمن يمشي مكباً على وجهه أهدى أمن يمشي سوياً على صراط مستقيم"

(الملك: 22)

Declaration

I certify that this thesis submitted for the degree of master is the result of my own research, except where otherwise acknowledgment, and that this thesis has not been submitted for a higher degree to any another universities or institutions.

Signature: 

Manar A. Hamad

Dedication

*To My: Parents, who made me this way, Husband for his
endless love and support that made me reached so far,
Sons, Daughter, Brothers and sisters for their support*

Manar Ahmad Hamad

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ABSTRACT

Background: Vocational training is a very important tool in the development of the communities. The vocational trainees are the products of the vocational training and its tool in the development. Their safety and health are very essential elements so they can fulfill their part in the development.

Aim: To assess the levels of occupational safety and health standards application in the training workshops in the vocational training centers in Gaza governorates.

Methods: The design of the study was descriptive, to determine the occupational safety and health standards, which should be available in the vocational training centers in Gaza Strip. The sample included all the vocational training centers that belong to local and international NGOs and the government sector and all the trainers working in these centers who had direct supervision and vocational training for the trainees with total number 109. In addition to the workshops of the centers where training takes place. Data was collected through self-administered questionnaire completed by one hundred and four trainers and checklist for eighty-three workshops. The response rate was 95% for employees and 100% for workshops.

Result: The providers of the vocational training in Gaza strip are very important providers such as UNRWA, MOL, MOW, and the NGO. Most of the centers provide vocational training for decays. The vocational trainers are well qualified, about 54% of them have experience years more than 10 years. The study results showed that about 70% of the trainers had received training on OSH issues but more than 80% of them did not know the concepts of OSH asked in the study. According to more than 80% of the trainers, the centers provide appropriate personal protective equipment (PPE). However, according to the results of the checklist, in about 50% of the workshops there were no PPE neither provided to the trainees nor training on the use of PPE. Only 26% of the trainers said that their centers have special OSH technician. In addition, 76% of the trainers think that their workshops need changes regarding occupational safety and health. Curriculum of occupational safety and health is available in the centers according to 87% of the trainers. Emergency plans are not available in 84% of the workshops. Alarm system is not available in 71% of the workshops. Regarding the occupational hazards in the workshops, 85% of the workshops do not have any precautions against fire hazards. More than 90% of the workshops have good and accepted electrical hazards precautions. The physiological hazards were as following, the illumination was poor in about third of the workshops. Natural ventilation is accepted but more than 60% of the workshops have no ventilation system. The conditions regarding the chemical hazards in the workshops are very poor. The hand tools used by the trainees are in good condition and suitable for the type of work. In about 40% of the workshops, there are no first aid boxes. The study results showed that the most common injuries among the trainees were the cuts (38%), burns and eye injuries (15%), fractures (12%) and electric shock (9%). There were statistically significant differences between the center's providers in reference to the occupational hazards.

Conclusion: The vocational centers need to pay more attention to the occupational safety and health standards to ensure the safety of the trainers and trainees. Provision of training to the trainers and trainees regarding OSH issues is required.

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List of Abbreviation

ACGIH	American council of government industrial hygienists
ALO	Arab labor organization
ENETOSH	European Network Education and Training in Occupational Safety and Health
EASHW	European Agency for Safety and Health
ILO	International Labor Organization
MOH	Ministry of Health
MOM	Ministry of Manpower
MSDS	Material safety data sheet
NGOs	Non Governmental Organization
OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
OSHS	Occupational Safety and Health Standards
PCBS	Palestinian Central Bureau of Statistics
PNA	Palestinian National Authority
PPE	Personal Protective Equipments
SPSS	Statistical Package for Social Sciences
VE	Vocational Education
OPT	Occupied Palestinian Territory
TVET	technical vocational education and training
VT	Vocational Training
MOL	Ministry of labor
UNRWA	United Nations Relief and Works Agency
WHO	World Health Organization

Chapter 1

1.1 Introduction

Human development is the aim that all the communities try to achieve to accomplish the comprehensive economical, social, and cultural growth, and serve the individuals, community, and organizations. Man is the method of development and its tool and aim. Thus, it is very important to emphasize on the human resource development as a basic element in the development of the modern communities.

Education with its all levels and different fields considered the main tool to accomplish this development. Moreover, here rises the important role of the vocational training as a base for aimed human resource economic and social development of modern communities, which based on manufacturing and production to accomplish the comprehensive development in all fields.

For this kind of education, to achieve its goals and objectives, its programs has to be built on the demand of the development and the work market, and the demands of the training sites and its workers. It is through development of the capacity and qualifications of the human resources through effective training programs vocational training has the ability to provide comprehensive and complete training opportunities to achieve effective vocational growth, as it is the main way to meet the demands of the community qualitatively and quantitatively.

"The vocational training is considered one of the most important engines which help in process of transformation of technology and contain it , and to maintain the balance between the two sides of offers and demands of qualified working power in the work market" (Jaber, 2001,^a).

Evaluation and development of the training programs consider the main base to build the process of training, to match the demands of the jobs with its different kinds and specialties, and determine the qualifications that should the vocational trainers have to fulfill their duties and responsibilities completely. One of the most important qualifications they should have is the qualification of occupational safety and health skills as it is one of the main qualifications for the workers in all kinds of work fields. Another important aspect should be considered is the availability of the occupational health standards in the workshops of the vocational training centers. The vocational training programs in Gaza strip have lack of this kind of skills and knowledge as part of the training programs. It also has lack of special technicians in this field in the centers. The trainers also have lack of knowledge regarding the occupational safety and health standards and skills to train the students and develop their skills in this important field, which is a very important part of the job.

1.2 Research Problem

Economically, morally, and legally occupational safety and health has become an important issue. Occupational safety and health is concerned with preserving and protecting human and facility resources in the workplace. Occupational safety health involves helping people by preventing them from being injured or becoming ill due to hazards in their workplaces (Friend; 2007).

As a result of my observations of the training workshops in Gaza Training Center, these workshops has lack of the minimum occupational safety and health standards, and the trainers do not have the adequate knowledge and skills regarding the occupational safety and health standards in their workshops and their jobs. In addition, the center has no employee specialized in occupation safety and health to follow up these issues. Gaza Training Center is the largest vocational training center in Gaza Strip. The largest

vocational center is lack of occupational safety and health standards, what about the smaller ones?

1.3 Justification of the Study

In Gaza strip, there are thirteen vocational centers. These centers graduate hundreds of technicians each year to the work market. The trainee spends about two years in the training program. The average hours spent daily in the workshops are four hours, about 28 academic hours weekly. If these workshops did not meet the requirements of the occupational safety and health, the trainees will be in danger for accidents. As the trainees of these centers are the future workers in the fieldwork, they will reflect their training experience on their jobs and careers. If their training programs did not include the occupational safety and health skills and their workshops did not have the occupational safety and health standards, then their workshops and practice in the field will lack these skills and standards. Then, they are again in danger for accidents plus occupational diseases. These are the reasons to choose this problem to be addressed. In this study, I will try to explore the weaknesses regarding the previous issues and try to come up with the right recommendations. In order to improve the training programs regarding the occupational safety and health standards through the diagnosis of the problems and obstacles, and try to determine the necessary occupational safety and health standards for each job and include it in the training programs.

Reviewing the integration of OSH information into vocational and technical training begins with considering the school-related injury or illness risks that exist for students and teachers. No comprehensive statistics have been published on injury or illness rates in vocational schools or among vocational students and their teachers.

This study is the first of its kind. The vocational training centers in Gaza strip are well known and easy to reach. It has strong influence on the work market, as its trainees are its products to the work market. The instruments needed for the study are available. My work experience gave me quite enough knowledge regarding my topic.

In the other hand, this study will highlight the importance of the following fields regarding the development of the vocational training in Gaza governorates. These fields are developing the training workshops regarding the occupational safety and health standards; develop the vocational training programs regarding the occupational safety and health standards. Decision makers in the vocational training field to determine the types of training courses required for the trainers in the vocational training field and determine the conditions and standards of the occupational safety and health, which should be available for each specialty, could use this study. In addition, this study will start awareness campaigns about the issues of occupational safety and health in the vocational training centers and identify the problems and obstacles regarding the occupational safety and health.

1.4 Research Objectives:

1.4.1 General Objective

To assess the status of occupational safety and health standards application in the training workshops in the vocational training centers in Gaza governorates.

1.4.2 Specific Objectives

- To determine the occupational safety and health standards that should be applied in the different training workshops in the vocational training centers.
- To identify the weaknesses among the trainers of the vocational training centers regarding the occupational safety and health knowledge, attitudes, and skills.

- To determine the level of safety and health knowledge, attitudes, and skills included in the vocational training programs in vocational training centers.
- To describe the types and causes of accidents among the trainees in the training workshops of the vocational training centers.
- To suggest suitable recommendations regarding the occupational safety and health training programs in the vocational training centers.

1.5 Research Questions:

- What are the occupational safety and health standards, which should be in the different training workshops of the vocational training centers in Gaza Governorates?
- What is the level of knowledge of the trainers regarding the occupational safety and health standards in their workshops?
- Do the training programs of the vocational centers include training on occupational safety and health skills?
- Do the trainers receive training on occupational safety and health skills?
- Are there any statistics on the number and types of occupational accidents in the training workshops in the vocational centers?
- What are the occupational safety and health standards, which already applied in the different training workshops in the vocational training centers?
- What are the types of training courses regarding occupational safety and health should be administered to the trainees in these vocational training centers?
- Are there technicians of occupational safety and health employed in these vocational training centers?

1.6. Socio-demographic Context

Palestine constitutes the southwestern part of huge geographical unity in the eastern part of the Arab World. The entire area of Palestine is about 27000 sq. kilometers (Annex 1). The historical Palestine now comprises two areas separated geographically: West Bank and Gaza Strip" (Palestinian Academic Society for the Study of International Affairs-PASSIA, 2009).

Although the Gaza Strip (Annex 2) is a narrow piece of land that is located on the coast of Mediterranean Sea, its position on the crossroad from Africa to Asia made it strategic for occupiers over centuries (PASSIA, 2009). By the end of 2010, about 4 million Palestinians were living in the Palestinian Territory, of them 2.5 million were in the West Bank and 1.5 million in the Gaza Strip (Palestinian Central Bureau of Statistics-PCBS, 2009). According to data available in 2009, the percentage of the refugee population in the Palestinian Territory is 45.0% of the total Palestinian population living in the Palestinian Territory, 18.8% in the West Bank and 26.2% in the Gaza Strip; the refugee population is distributed by the region at 30.2% in the West Bank and 69.2% in the Gaza Strip (United Nations Relief and Works Agency- UNRWA, 2008).

The Gaza Strip is a crowded place with area of 365 Sq. km. which constitute 6.1% of total area of Palestinian territory land and considered one of the most populated places on the earth (PASSIA, 2009).

According to the education indicators in Palestine, we can conclude that Palestinian community is a well-educated one and that Palestinians have always highly appreciated education (MOH, 2005).

1.7 Operational Definitions

The Vocational Training: an activity directed to identifying and developing human capabilities for a productive and satisfying working life. Vocational education and training is any formal, post-compulsory education that develops knowledge, skills and attributes linked to particular forms of employment, although in some interpretations this would exclude professional education (ILO, 2008).

The Vocational Training Centers: The vocational training centers which will be included in the study are those centers that provide vocational training programs such as carpenter, welding, construction, mechanics, electricity works, maintenance of office equipment, sanitary appliances, refroidissement and air conditioning, decorating and aluminum works. These training centers not considered high education institutions. These centers provide vocational training to trainees aged from 14 to 18 years.

Occupational Safety and Health: it is a cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. The goal of all occupational health and safety programs is to foster a safe work environment.

Occupational health should aim at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations. And the prevention among workers of departures from health caused by their working conditions. The protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities; and, to summarize, the adaptation of work to man and of each man to his job" (ILO, WHO).

Occupational Safety and Health Standards: standards or regulations created to provide workers with a safe working environment it is an essential part of a new framework to cultivate good safety habits in all individuals at the workplace from top management to the last worker. It requires every person at the workplace to take reasonably practicable steps to ensure the safety and health of every workplace worker (MOM, 2006).

Chapter 2: Literature Review

2.1 Conceptual Framework

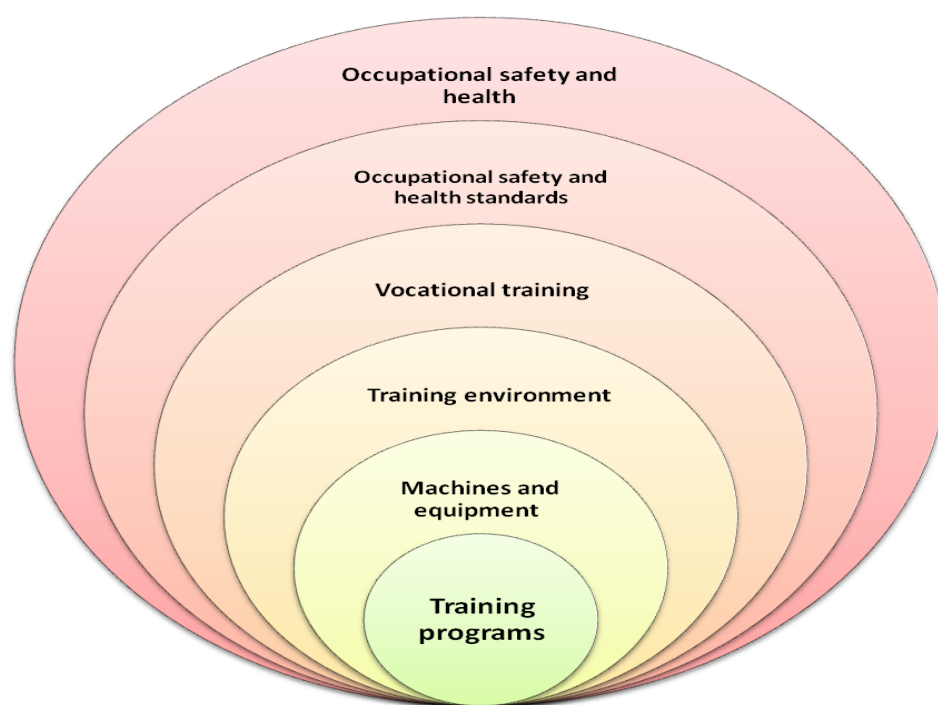


Figure 2.1 conceptual framework

In this study, the conceptual framework (figure 2.1) explores the main factors that could influence the occupational health in vocational training centers. The core factor is the training programs of the vocational training and should be planned carefully to meet the needs of the training and training on occupational safety and health should be essential part of these training programs as will appear in the literature review. The second factor is the machines and equipment necessary for the training and it is very important source of hazards to the trainees and their trainers. Therefore, it should follow the standards of occupational safety and health to minimize these hazards. The third factor is the training environment, which is very important element in the safety of the trainees and their trainers. In addition to, all the occupational safety and health standards, which should be applied to the training environment as, will be approved later. The forth factor is the vocational training which is the total of the previous factors. The fifth factor is the

occupational safety and health standards, which should be part of all the previous factors so the sixth factor, which is the occupational safety and health, is accomplished.

2.1.1 Training Programs:

Vocational training as perceived by the researcher starts with effective training programs, which should be developed as far as possible, in relation to the work force requirements and development of industry and services in the region and the work market. Vocational training defined as an activity directed to identifying and developing human capabilities for a productive and satisfying working life (Jaber, 2001,a).

The training programs as perceived by the researcher have the following components: the curriculum, the machines and equipment, and the workshops. In addition, one important component is the trainers of the programs.

2.1.1.1 The Curriculum:

The curriculum is the technical and theoretical topics of the training specialty. The researcher aims to make topics of occupational safety and health essential part of the curriculum with modifications according to the specialty. The curriculum has three main components, which are the theoretical information, the practical skills, and the right occupational attitudes. Theoretical information: is the group of theories and information making the base to the performance practice, which is the aim of training. The practical skills: the skills needed to be performed by the trainee. The right occupational attitudes: are the rules and conditions, which should be taken into consideration during job practice. Come under it hygiene, caring, caution, and maintenance of the work environment and the work equipment and tools. Also, the occupational safety and health conditions, that should be taken into consideration (Jaber, 2001, a).

To achieve the safety and health in work place the workers should be trained on the following two important programs. The first one is loss prevention which is a program designed to identify and correct potential accident problems before they result in financial loss or injury. The second one is loss control which is a program designed to minimize incident based financial losses (Friend and Kohn, 2007).

Loss prevention includes training on safe practices at work to prevent the accidents. Loss control training on accident management to minimize the losses. Therefore, these programs should be included in all the training programs of the vocational training regardless the training type.

Studies have shown the importance of integrating training on health and safety in the training programs of the vocational training. As this training is important in preventing work related injuries and diseases.

1- Integrating Occupational Safety and Health Information into Vocational and Technical Education:

In the united states of America, the high rates of injuries among young workers especially the new workers led to this study. The researchers believed that, incorporating occupational safety and health (OSH) information into the vocational and other workforce preparation programs in the United States might provide a mechanism for reducing work – related injuries and illnesses. They assessed the status of including OSH information or training in workforce preparation programs and found there is an inconsistent emphasis on OSH information. The study conclusions were, the various approaches for vocational training all have intuitive appeal as useful means for enhancing young and new worker's safety and health, little quantitative information exists on(1) the extent of OSH training provided within the vocational training programs and(2) the effectiveness of the programs for reducing occupational injuries

and illnesses. Efforts to evaluate incorporating OSH into vocational technical education and other workforce preparation programs will require studies that evaluate programs in a systematic manner. Training alone will not lead to reducing the incidence of occupational injuries and illnesses. Young workers face limitations in their ability to put into practice what they learned in training programs because they lack experience, and sometimes self-confidence, to raise safety and health issues. There is also need for management commitment to OSH (Schulte P. et al. 2005).

2- Awareness Of A multitude Of Issues Related To Occupational Safety and Health:

The Bilbao- based European Agency for Safety and Health European week in 2006 had specific topic regarding OSH. The 2006 campaign has the motto “safe start” and is dedicated to young people at the beginning of their work lives. The Austrian experience was presented as a success story. The Austrian labor inspectorate has enhanced its activities related to youth and occupational safety and health. All over Austria, cooperation with schools has focused on making young people aware of a multitude of issues related to occupational safety and health. The school projects awarded a prize by federal minister of economics and labor. The upper Austrian vocational training institute and the Linz labor inspectorate jointly conducted the project. Eighteen students of the age 15-18 age group were involved within the framework of a vocational training course. The topics of the course were information about occupational safety and health, with the focus on health hazards and burdens. The students verified this information through their own observations on their on job training. They visited the training workshop and shown positive examples. Since the Project was successful; it will integrate into the regular curriculum (EASH, 2006).

3- Mainstreaming Occupational Safety and Health into Education:

This is the name of a project held by European Network Education and Training in Occupational safety and health (ENETOSH). The objectives of the network were, joint quality assurance of education and training on occupational safety and health in Europe, high quality mainstreaming of health and safety into education system, and active knowledge sharing between the OSH sphere and education experts. The target groups were lecturers and trainers from the accidental insurance institutions in Europe, educational staff in general and vocational education, and multipliers and policymakers. European framework OSH adopted the following community strategies on health and safety on workplace: 2002-2006, defined education and training as key factors for the development of a true prevention culture, 2007-2012, calls for safety and health to be integrated into all educational phases and all areas of society by the year 2012. Three different approaches used: holistic, curriculum, and workplace approach. Eighteen different countries participated in the project. Here are some success stories. Promoting safety culture- institute of technology, Ireland, the success factors were commitment of the OSH, holistic approach covering staff and students, consultation and communication with teaching departments, and involving student's union in the prevention and safety promotion process (Bollmann U, 2009).

Another success story is the story of Ambassador Network for teachers, Denmark. The level of work is in the vocational schools in the social and health care sector. The program organized by the Danish employer trade union occupational health and safety council for the social and health care sector in corporation with 11 vocational schools. The aims are to provide support to vocational teachers in the sector regarding teaching their students about occupational safety and health- the work environment. In addition, to strengthen the teachers to function as ambassadors with special knowledge on OSH-

the work environment, to create a network of ambassadors from different schools in order to share experiences, obtain information and create knowledge, and to improve the dialogue between teachers and work counselors. The success factors: networking as a way to provide channels of information and knowledge between schools, participation within the network as a kind of in service training, strengthening the position of teachers dealing with OSH- work environment, inspiration of the teachers by the network, and sector approach and cooperation with social partners (Bollmann U, 2009).

4- Training For Safety:

Another story is from Germany. The level is initial vocational training and continuing vocational training. The aim is to develop an online platform for learning and teaching safety and health in mechanical, metal and electrical engineering works. This online platform helps to stimulate media competence, to introduce into OSH by a teaching approach based on experiencing problems and providing solutions (active learning) and to develop learning modules that are flexible and suitable for different learning situations. The program carried out within the scope of Initiative New Quality of work, Germany. The success factors are high quality of the content, media suitable for the target group, various contents suitable for students, apprentices and teachers, active and experienced based learning and implementation of the concept within enterprises. (Bollmann U, 2009).

5- Strategy To Protect Young Workers:

A model of (OSH) for young workers suggesting a two-way strategy to combat OSH risks to them. Include prevention culture needs to be promoted among new recruits, but also at all levels of education and regulatory measures to improve jobs and workplaces.

This model suggested by the European Agency for Safety and Health at Work (EASHW, 2009). Annex (1) shows this model.

2.1.2 Machines and Equipment:

The training programs require different kinds of machines and equipment needed to train the trainees. Such machines and equipment designed to drill, cut, shear, punch, punch, chip, staple, stitch, abrade, shape, stamp, and slit. If appropriate safeguards are not in place or if workers fail to follow safety precautions, these machines and equipment can apply the same procedures to humans. The types of mechanical injuries that result are typically the result of cutting, tearing, shearing, crushing, bearing, straining, or puncturing. All of these hazards can be reduced by application of appropriate safeguards as occupational safety and health standards recommended. Other source of hazards is the quality of the machines and equipment especially the handy equipment (Goetsch, 2005).

One of the theories of accident causation is the multiple factors theory that uses four Ms to represent factors causing an accident: Machine refers to tools, equipment, or vehicles. Media includes the environmental conditions surrounding an accident. Man deals with the people and human factors contributing to the accident. Management also incorporates the other three Ms, looking at the methods used to select equipment, train personnel, or ensure a relatively hazard free environment. The multiple factors theory examines characteristics of each of the four Ms:

- 1- Machinery: examination of machinery characteristics includes the design, shape, size, or type of energy used to operate the equipment.
- 2- Man: characteristics of men are psychological state, gender, age, physiological variables (including height, weight, or condition); and cognitive attributes (such as memory, recall, or knowledge level).

3- Media: the weather conditions, temperature of the building, and out door temperature.

4- Management: characteristics of management could include safety rules, organizational structure, or policy and procedures.(friend and Kohn,2007)

Another theory of accident causation is system theory of causation. It based on interaction among three components: person, machine, and environment. Human variables of information, decisions, and perception of risks combine with machine hazards and environmental factors affecting the likelihood of an accident (Goetsch, 2005).

These two theories reviled the importance of safe machines and equipment in the workplace and the importance of trainees training on safe work practices to prevent workplace accidents, as they are the future workers in the work market.

2.1.3 Training Environment:

The training environment includes the buildings and the machines and equipment. The design of the training center and training workshops should be according to the safety and health standards to minimize the work hazards to the trainees and trainers. The work hazards from the training centers and workshops include the physical conditions (heat, light, ventilation, and radiation). Other hazards are the cleansing and organization of the workshops. When designing the structures of the training environment, training premises, training methods or the use of machinery, training equipment and other devices used as well as the use of health hazardous substances, the trainees should be ensured that their safety and health would not be affected. In designing and planning training workshop, the physical and mental capacities of the trainees should be taken into account in order to avoid or reduce hazards or risks from the workload factors to the safety and health of the trainees and their trainers.

The workshops of training are very important part of the vocational training. They are the place where the trainees get their practical training to gain the skills needed to perform their work in the work market. These workshops should be the same as found in the real work market by its equipment, tools, and designs. This is why it considered workplace to the researcher, should be treated as workplace, and has all the occupational safety and health conditions according to the occupational safety and health standards. The work environment, which is the training workshops, has the following components: the building, the equipment and machines, and the physical conditions. The physical conditions are the light, ventilation, temperature, humidity, and noise (ALO, 1999).

The work environment defined as the place and circumstances where work take place. Place is the building or the field. Circumstances are the work conditions and the climate (El Kharabsha and El Amery, 2000).

The work environment has direct relationship with the occupational safety and health requirements needed to protect the elements of production, which are the workers, the materials, and the equipment (El Kharabsha and El Amery, 2000).

2.1.3.1 The Building: The Palestinian act number 21 for the year 2003 stats the following safety conditions that should be in the workplace to insure the safety of the workers:

1- The design: The following conditions should be considered in the design: The size and design appropriate for the nature of the work. Enough spaces shall be left between the buildings to facilitate safe movement of vehicles. The stores are appropriate for the type, size and nature of the stored materials. Special places for waste disposal are present. Provide enough spaces for the workers not less than 11.5 cubic meters for each worker. Enough spaces for machines and equipment so the worker movement and performance not prevented. Determine the entrances, exits and emergency exits. The building should be

generally immune against the hazards of fire and collapse according to the nature of the work. A system of fire, humidity, vibrations and noise shall be provided in the building.

2- The ceiling: The following conditions should in the design of the ceiling: The strength and safety factor. The high is not less than three meters. To be coated with isolation material of heat and humidity.

3- The floor: to be made of strong material and has the ability to tolerate heavy machines and equipment. To be cleaned easily. Isolated from humidity and do not absorber liquids. To be straight free of holes or other obstacles, this can cause accidents, like falling, and should prevent slipping.

4- The walls: Have strength and the ability to tolerate. The inner surfaces are smooth and easy to clean. To be painted with bright colors to give more light. Free of sharp protrusions and cracks.

5- The passages: the passages should be in adequate number with enough width to allow the passage of the workers and equipment and to have signs showing the emergency exits. The passages between the workplace should be straight smooth to prevent slipping and falling. In cases of sudden turns, mirrors should be placed at points of turns.

6- The windows: large enough to give the maximum use of light and ventilation, and to be cleaned easily.

7- The doors: should be in enough number and adequate width. Entrance doors should be distinguished from exit doors. Doors for vehicles should be different from people's doors.

8- The stairs: to be strong has the capability to tolerate heaviness. To be made of material prevents slipping and easily cleaned. The stairs over four should have sides not less than 75

cm. the stairs should have adequate lighting. The states should have the ability to resist fire. (Pal. Act, 2004).

Before talking about the physical conditions in the workplace, the researcher will first talk about the occupational hazards in the workplace and then mention the standards which should be for each condition to prevent these occupational hazards.

2.1.3.2 The Occupational Hazards:

Hazard: is a condition with the potential of causing injury to personnel, damage to equipment or structure, loss of material, or lessening of the ability to perform a prescribed function (Goetsch, 2005).

Risk: is a combination of the probability that a particular outcome will occur and the severity of the harm involved (Goetsch, 2005).

The occupational hazards are the mechanical, physical, chemical, and the biological hazards of the work place (pal. Act, 2004).

2.1.3.2.1 The Mechanical Hazards:

Those associated with power driven machines, whether automated or manually operated. The mechanical injuries are the result of cutting, tearing, shearing, crushing, breaking, straining, or puncturing (Goetsch, 2005).

All these hazards can be reduced by the application of appropriate safeguards.

According to the American national safety council, the safeguards should have the following requirements: prevent human contact with any potentially harmful machine part. Be secure and durable so it cannot be removed. Protect against falling objects because objects falling onto machine mechanisms increase the risk of accidents, property damage,

and injury. Create no more hazards; it should overcome the hazards without creating new ones. Create no interference with the progress of work. Allow safe maintenance, should be designed to allow the more frequently performed maintenance tasks (Goetsch, 2005).

When working with machines, the following general rules should be followed to prevent accidents. The machine should not be operated before knowing how to shut it down. It should be known how to cut off the electricity in cases of emergencies. The worker operating the machine should not be talked to or be touched. The machine should be turned off before any maintenance task or cleaning. The safeguards should be on before operating the machine. Personal protective equipment should be used during the work. Keep floor around the machine clean to prevent falling down. Isolate the noise and or vibration-causing machine and should be surrounded by protection walls. The lighting and ventilation in workplace should be appropriate. No smoking or eating and drinking during work (El Kharabsha and El Amery, 2000).

According to the Palestinian act regarding the safety measures of machines and equipment, the following instructions must be followed: any machine or mechanical equipment must be operated only by specialist or under his supervision according to the safe operation rules. Any unsafe machine must not be operated immediately until be fixed. All the machines and equipment must provide with self-protection means, which should be appropriate for the type and nature of the work. The instructions of the manufacturing company must be followed regarding the operation method, cautions, and regular maintenance. Each machine and equipment must have special record for the maintenance with the results of maintenance and if any part was replaced. Adequate spaces must be maintained between and around the machines and equipment to allow easy movement of the workers and maintenance. During the maintenance, the machine or equipment must be shut off and removed from electricity. Appropriate safeguards with the following

conditions should cover all the moving parts of the machine and equipment. Give full protection. Prevent contact between the worker and the moving parts. Do not interfere with the work, work automatically with minimum effort, do not interfere with the maintenance, resist the workload and fire, do not cause accidents, and well fixed. Source to cut off electricity of the machine and equipment should be near by in case of emergencies. The workers should be protected from the flying pieces or sharp object with the appropriate methods, the workers should be instructed not to wear clothes or ties, long hair must be restrained, equally the necklaces or jewelry which can dangle so that it can not come into contact with the moving parts of the machines and equipment's (Pal, act, 2004)

The occupational safety and health act number 738/2002 states the following instructions regarding the safe use of machines and work equipment. Only such machines, work equipment and other devices may be used at work that comply with the applicable provisions and that are suitable and fit for the work and working conditions concerned. Their correct instillation and necessary safety devices and marking shall be insured. The use of machinery, work equipment and other devices shall not in any other respect cause hazard or risk to the employees work with them or other people at the workplace. The machinery, work equipment or other devices shall be used, maintained, cleaned and serviced appropriately. Access to the danger zones of machinery or work equipment shall be restricted by means of their construction, placement, guards or safety devices or by other by other suitable means. Necessary preparations for servicing, adjustments, repairs, cleaning, disturbances and other exceptional situations shall be made to ensure that they do not cause any hazard or risk to the employee's safety and health (OSHA, 2002, a)

Hand tools: hand tools are that powered manually. Hand tools include any thing from axes to wrenches. The greatest hazards posed by hand tools result from misuse and improper maintenance (OSHA, 2002, b).

Most if not all, the workers use hand tools. These hand tools such as chisels, shovels, handsaws, hammers, knives, cutters and pruning shears may seem easy to use but they can also be very dangerous if the worker is not careful.

Injuries from hand tools are generally due to:

Using the wrong tool for the job. Using a broken or damaged tool. Improperly using a tool. Not wearing personal protective equipment. Not paying attention while working, or being in too big of a hurry.

Hand tool injuries may include cuts, bruises or puncture wounds, eye injuries from flying chips or other debris, damage to the nerve in the wrist from repeated use of a tool while bending the wrist.

Other serious injuries may include broken bones, resulting from a tool that slips, falls, or thrown and severed fingers from knife or saw blade cuts (OSHA, 2000)

Basic rules for hand tools safety: hand tools should be in good condition, and its size right for the job, and it is in the proper working condition. Every tool must be used for its intended purpose. Hand tools should not be forced beyond their capacity (JMU, 2004)

2.1.3.2.2 The physical hazards: according to the Palestinian act of year 2004 regarding the occupational hazards, the physical hazards are about the physical conditions in the workplace which are the ventilation, temperature, humidity, lighting, noise, vibrations, and ionic radiation. Also according to the same resource, the employer is obligated to take all the precautions and means to provide protection of the physical hazards in workplace.

Ventilation: means providing clear and clean air continuously in the work environment by natural or mechanical means or both (El Kharabsha and El Amery, 2000).

The ventilation depends allot on the nature of the work, the levels of heat, coldness and humidity, and the levels of gases, smoke, dust and odors in the air. (El Kharabsha, El Amery, 2000)

Types of ventilation: the type of ventilation determined according to the nature of work, the production processes, and the amount of pollution needed to be removed (Helmi and El Afshouk, 2000).

- 1- Natural ventilation: it is the best type. It is provided mainly fro the windows or ceiling openings. It creates air force, which pushes the polluted air outside (Helmi and El Afshouk, 2000).
- 2- Vacuum Ventilation: it is artificial ventilation by using vacuums to vacuum the polluted air out side before mixing with the room air (Helmi and El Afshouk, 2000).
- 3- Injected Ventilation: it moves the air within the room from one area to another (Helmi, and El Afshouk, 2000).

The Palestinian act regarding the ventilation states the following: The ventilation inside the workplaces shall be appropriate so it prevents the stases of air or slowing the degree of renewing it with the avoidance the presence of pollutant air and elevation of heat and humidity or their sudden changes. The gases, dusts, steams and smoke shall be controlled from the resource as much as possible. The volume of clean air needed for each person shall not be less than 18-75 cubic meter in an hour according to the muscular effort performed. The speed of air inside the workplace shall not exceed 15 meter in the minute in winter and 50 meter in the minute in summer (pal. Act, 2000).

The occupational safety and health act number 738 for the year 2002 stats the following standards for ventilation of workplace and volume of workrooms: there shall be enough satisfactory air to breathe at workplaces. The ventilation of workplaces must be appropriate

and effective enough. The volume and area of workrooms shall be adequate. There must be enough room for working and motion required by the work.

Temperature: Part of providing a safe and health workplace is appropriately controlling the temperature, humidity, and air distribution in work areas. A work environment in which the temperature is not properly controlled can be uncomfortable. Extremes of either heat or cold can be more than uncomfortable. They can be dangerous. Heat stress, cold stress, and burns are major concerns of occupational safety and health. Thermal comfort in the workplace is a function of a number of different factors. Temperature, humidity, air distribution, personal preference, and acclimatization are all determinants of comfort in the workplace (Goetsch, 2005).

Heat related concepts:

Conduction: The transfer of heat between two bodies that are touching, or from one location to another within a body (Goetsch, 2005).

Convection: The transfer of heat from one location to another by a way of a moving medium (Goetsch, 2005).

Metabolic heat: is produced within a body because of activity that burns energy. All humans produce metabolic heat (Goetsch, 2005).

About 75% of human's energy transferred to heat to the surrounding environment through the body and breathing (El Kharabsha and El Amery, 2000).

Radiant heat: is the result of electromagnetic nonionizing energy that is transmitted through space without the movement of matter within that space (Goetsch, 2005).

Environmental heat: is produced by external sources. Gas or electric heating systems produce environmental heat as do sources of electricity and some of industrial processes (Goetsch, 2005).

Heat stress and strain: heat stress is defined as the net load to which a worker may be exposed from the combined contributions of metabolic cost of work, environment factors (temperature, humidity, air movement, and radiant heat exchange) and clothing requirements. A mild or moderate heat stress may cause discomfort and may adversely affect performance and safety but it is not harmful to health. As the heat stress approaches human tolerance limits, the risk of heat related disorders increases (Goetsch, 2005).

1. Heat strain: is the overall physiological response resulting from heat stress.

Acclimatization: is a gradual physiological adaptation that improves an individual's ability to tolerate heat stress (Goetsch, 2005).

Heat stress management: The Palestinian act for physiological hazards regulations states the following: the air speed inside the workplace shall not exceed 15 meters per minute in the winter, and 50 meters per minute in the summer. The temperature should be appropriate as in the first hour of work should not be less than 15 c ° in winter and not more than 30 c ° in summer. If this cannot be done the exposure, time should be limited. In cases of heat stress in workplace, appropriate measures should be done to improve, the heat stress including providing information to the workers regarding the heat stress. To avoid the adverse effects of heat stress and cold stress periods of exposure and rest should be regulated (pal. Act, 2000).

The Arab labor organization's guideline for occupational exposure limits and standards regarding heat stress in workplace is shown in Annex (2).

The occupational safety and health institution in Amman Jordan recommended temperature according to the work type. It is shown in Annex (3).

The American council of government industrial hygienists (ACGIH) recommended the following general controls of heat stress; verbal and written instructions, training programs, other information about heat stress and strain should be provided. Workers should be encouraged to drink small volumes of cold water about every twenty minutes. Teaching workers about signs and symptoms of heat stress in addition to how to observe it. Medical screening to identify those susceptible to systemic heat injury is very essential.

In addition, the ACGIH recommended the following specific controls: establishing engineering controls that reduce the metabolic rate, provide general air movement, reduce process heat and water vapor release, and shield radiant heat sources. Administrative controls that set acceptable exposure times, allow sufficient recovery, and limit physiological strain (Goetsch, 2005).

Effects of Heat on Human Body: when worker exposed to heat may experience one or more of the following effects: heat stroke, heat exhaustion, heat cramps, and heat prostration (Helmi, and El Afshouk, 2000).

Lighting: it defined as the quantity of light over specific area. The good lighting in the workplace has direct effect on the vision of the workers in both its weakness or over lighting. The quality of lighting on workplace is determined by several factors as follows: the quantity, free from reflections, regular levels, continuity, and the right color (Helmi and El Afshouk, 2000).

The Palestinian act for physiological hazards regulations states the following regarding the lighting in workplace: the glass of windows should be clean all the time from inside and outside. The light sources should be distributed all over the workplace so they give the same level of light all over the workplace. The light should be free from reflections. The color of the walls and ceiling is bright to give good lighting. Emergency lights are available in case of power off especially in the corridors and exits (pal. Act, 2000).

The Arab Labor Organization Instructions for Light Are As Follow:

These limits should be appropriate for all workers from different age groups in the workplace and to the different types of activities. These general rules should be considered: The light must not lay on the eye directly either from the source or reflected from shiny surface. The eye must not be exposed to sever light without protective equipment. The light in workplace should be indirect. In addition, should meet the limits accepted according to the work activity. The light should be measured from above the work surface. The limits mentioned in the tables are the minimum level, which the light must not get below it in the workplace (ALO, 1999)

Noise: most of the industrial work sites can be noisy. This poses two safety and health related problems. First, there is the problem of distraction. Noise can distract workers and disrupt their concentration, which can lead to accidents. Second, there is the problem of hearing loss. Exposure to noise that exceeds prescribed levels can result in permanent hearing loss (Goetsch, 2005).

The fundamental hazard associated with excessive noise is hearing loss. Exposure to excessive noise levels for an extended period can damage the inner ear so that the ability to hear high frequency sound is diminished or lost. Additional exposure can increase the damage until even lower frequency sounds cannot be heard. A number of different factors

affect the risk of hearing loss associated with exposure to excessive noise. The most important of these are intensity of the noise, type of noise, duration of daily exposure, total duration of exposure, age of the individual, coexisting hearing disease. In addition to, the nature of environment in which exposure occurs, distance of the individual from the source of the noise, position of the ears relative to the sound waves (Goetsch, 2005).

The excessive noise with long periods of exposure also can affect the nerves of the workers. Of these various factors, the most critical are the sound level, frequency, duration and distribution of the noise. The unprotected human ear is at risk when exposed to sound levels exceeding 115 dB. Exposure to sound levels below 80 dB is generally considered safe. Prolonged exposure to noise levels over 80 dB should be minimized with the use of appropriate personal protective devices (Goetsch, 2005).

Noise also can cause neuro prostration, and psychological exhaustion. (Helmi, and El Afshouk, 2000). Other problems caused by noise are communication problems, isolation, and productivity problems (Goetsch, 2005).

The Palestinian act states that the noise levels at workplace should not exceed the safe limits by taking the appropriate precautions. The exposure of workers to noise at workplace should be limited (pal. Act, 2004).

The Arab labor organization in its guide to occupational exposure states the following standards regarding the noise: The noise thresholds in these standards are according to the level of sound pressure and periods of exposure which believed that most of the workers can be exposed to it day after day without any effect on their hearing. The noise level is measured by sound level meter and the unit is decibel db.

In the work environment, the workers expose to two types of noise: continuous noise and impact noise. Annex (4)

It is forbidden to expose the workers to continuous noise level more than 115 db.

It is forbidden under any circumstances to expose the workers to impact noise level more than 150 db (ALO, 1999).

To decrease the risk of hearing loss, exposure to noise should be limited to a maximum eight-hour time weighted average of 85 dB. The following general rules should be applied for dealing with noise in the workplace: exposure of less than 80dB may be considered safe for the purpose of risk assessment. A time-weighted average (threshold) of 85dB should be considered the maximum limit of continuous exposure over eight hour days without protection (Goetsch, 2005).

The OSHA regulations relating to occupational noise exposure and hearing conservation, has these basic requirements for hearing conservation programs as follow: hearing hazards monitoring, engineering and administrative controls, audiometric evaluation, personal hearing protection devices, education and motivation, record keeping, and program evaluation (Goetsch, 2005).

The Arab labor organization limited the weighted average of 85dB as the maximum level for the workers to be exposed to it in the work environment for the daily eight hours work for five days weekly. England has the limit to 90dB as the maximum exposure for eight hours daily work for five days weekly (Awad and El-Jundi, 2003).

2.1.3.2.3 The Chemical Hazards: It is a type of occupational hazards includes mists, vapors, gases, dusts, and fumes. Chemical hazards are either inhaled, absorbed through the skin, or ingested (Goetsch, 2005).

These chemicals affect the human body when absorbed. The effects are according to its characteristics and mode of entry to the human body. The inhalation of the chemicals in the workplace is one of the most important causes of occupational diseases by its different kinds. The most important harmful substances inhaled are classified as the following: dust causing respiratory damage, dust of plants, dust and vapor of toxic substances, and harmful gases (Helmi, and El Afshouk, 2000).

Toxic Substances: is one that has a negative effect on the health of a person or animal. Toxic effects are a function of several factors including the following: properties of the substance, amount of the dose, level of exposure, route of entry and resistance of the individual to the substance (Goetsch, 2005).

Effects of Toxic Substances: the effects of toxic substances vary widely, as do the substances themselves. All various effects and exposure times can be categorized as being acute or chronic.

Acute Effects and Exposure: they involve a sudden dose of a highly concentrated substance. They are usually the result of an accident that results in an immediate health problem ranging from irritation to death. Acute effects and exposures are sudden, severe, typically involve just one incident, and cause immediate health problems. Acute effects and exposure are not the result of an accumulation over time (CDC, 2005)

Chronic Effects and Exposure: they involve limited continual exposure over time. Consequently, the associated health problems develop slowly. The characteristics of chronic effects and exposure are continual exposure over time, limited concentrations of toxic substances, progressive accumulation of toxic substances in the body and progressive worsening of associated health problems, and little or no awareness of exposure on the part of affected workers (CDC, 2005).

Material Safety Data Sheets (MSDS): the workers should be warned of chemical hazards by labels on containers or material safety data sheets. MSAS are special sheets that summarize all pertinent information about a specific chemical. An MSDS should contain the following information: manufacture's name, address, and telephone number, a list of hazardous ingredients, physical and chemical characteristics, fire and explosion hazard information, reactivity information, health hazard information, safety precautions for handling, and recommended control procedures (CDC, 2005).

The Palestinian act for the chemical hazards control covers the following aspects related to the chemicals in workplace: the use and handling chemicals, storage of chemicals, and disposable of chemical waste. First, the use and handling of chemicals: MSDSs must be on all the chemical containers used by the workers and they should know it. The appropriate precautions should be done to prevent exposing workers to the hazard of mixture of chemicals with harmful effects. All the appropriate precautions to protect the workers from the hazards of chemical spills, hot chemicals, explosive substances, or any other harmful substances should be applied. All the residue of chemicals and the empty containers should be discarded appropriately. Empty containers should not be used as containers for food or drinks. First aid materials plus the eye and body washers should be available in the workplace. Appropriate precautions to prevent, remove, decrease the distribution, or decrease the concentration of the dangerous substances and harmful to health inside the workplace by using the appropriate engineering methods. The accumulation of dusts should be prevented by using engineering methods. The occupational safety and health precautions should be taken in the transportation and handling the chemicals inside the work environment. Second, storage of the chemicals: MSDSs should be in all the chemical containers. Only the amount of chemicals needed for the work processes should be at work sites. All the chemicals should be stored in its original containers. The containers should be

in good condition and arranged in good way with nothing on top of it or around it. The store area should be appropriately ventilated. The passages between the stored containers should be clear of any obstacles. The floor of the store smooth, easy to be cleaned, does not absorb liquids, and do not produce electrical sparkles. Explosive substances should not be stored near the oxidized substances, or store substances that react with each other near each other. The flammable substances have special storage conditions as follow: Should be stored in cold area with good ventilation away from flam resources. The store should be away from the work site, easy accessibility, good firefight system is available, the doors and cabinets of the store should be made of fire resistance material, and no smoking in the store or any source of open fire at least 6 meter away from the store. Third, disposal of chemical waste: the wastes should be removed from work site continuously and to be stored in special separated stores to be disposed later, the wastes should not be discarded in the sewage, and the wastes to be disposed according to the manufacture institution instructions. (pal, act, 2004)

OSHA act for occupational safety and health has the following instructions regarding exposure to chemicals in workplace. If air borne impurities, such as dust, smoke, gas or vapor, occur in a workplace to a degree which is injurious or disturbing to the employees, their spreading shall, as far as possible, be prevented by isolating the source or by placing it in a closed space or equipment. The airborne impurities shall be collected and removed to an adequate degree by means of appropriate ventilation. Employee's exposure to chemical agents that cause hazards or risks to safety and health shall be reduced to such level that no hazard or risk from theses agents is caused to the employee's safety or health or reproductive health. Particularly, protective measures necessary for preventing poisoning, oxygen deficiency or other similar serious risks shall be ensured. Special caution shall be exercised when handling, storing or transferring explosive, flammable or

corrosive substances or other substances involving similar hazards. The employees shall be given such information on dangerous substances that is necessary considering the working. (OSH, act, 2002)

In the hazard communication guidelines for compliance of OSHA the instructions for the employer regarding the chemicals in the workplace are the following: should compile as complete a list as possible of the potentially hazardous chemicals in the workplace, MSDS of all these substances should be received by the employer, employees should not be allowed to use any chemicals with no MSDS, MSDSs must be readily accessible to employees when they are in their work areas during their work shifts. Each employee who may be “exposed” to hazardous chemicals when working, must be provided information and be trained prior to initial assignment to work with a hazardous chemical, and whenever the hazard changes. Information and training are a critical part of the hazard communication program. Workers obtain information regarding hazards and protective measures through written labels and material safety data sheets. It is through effective information and training, however, that workers will learn to read and understand such information, determine how to acquire and use it in their own workplace, and understand the risks of exposure to the chemical in their workplaces as well as the ways to protect themselves. The training shall include: methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released), the physical and health hazards of chemicals in the work area; the measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures and personal protective equipment to be used; and the details of the hazard

communication program developed by the employer, including an explanation of the labeling system and the MSDS, and how employees can obtain and use the appropriate hazard information. (OSHA, 2007)

2.1.3.2.4 The Electrical Hazards: Electricity is often referred to as a “silent killer” because it cannot be tasted, seen, heard, or smelled. It is essentially invisible. Electricity has long been recognized as a serious workplace hazard, exposing employees to electrical shock; which can result in electrocution, serious burns, or falls that result in additional injuries or even death; as well as electrical arc-flash and electrical arc-blast. (Neitzel, 2005)

Electricity is the flow of negatively charged particles called electrons through an electrically conductive material. Electrons are freed from an atom and are directed by external forces to travel in specific direction produce electrical current also called electricity. When a surplus or deficiency on the surface of a material exists, static electricity is produced. It is called static because there is no positive material nearby to attract the electrons and cause them to move. Conductors are substances that have many free electrons at room temperature and can pass electricity. Electrical hazards occur when a person makes contact with conductor carrying a current and simultaneously contacts the ground or another object that includes a conductive path to the ground. This person completes the circuit loop by providing a load for the circuit and thereby enables the current to pass through his body. (David, 2005). Careless and ignorance of the safety instructions regarding the usage and maintenance of the electrical devices make the electricity source of danger to the human and materials. (Helmi, and El Afshouk, 2000)

All the training programs in the vocational training centers, subjects of this study, have electrical devices as part of the machines and equipment or the lighting resources. More than halve of the electricity related injuries happened to individuals who are not electricity

workers. So it is important to educate and train all the workers in the various kinds of work on the potential danger of electricity. (Helmi, and El Afshouk, 2000)

Sources of Electrical Hazards: short circuits are one of many potential electrical hazards that can cause electrical shock. Another hazard is water, which considerably decreases the resistance of materials, including humans. The resistance of wet skin can be as low as 450 ohms, whereas dry skin has an average of 600.000 ohms. According to ohm's law, the higher the resistance, the lower the current flow. When the current flow is reduced, the probability of electrical shock is also decreased. The major causes of electrical shock are contact with a bare wire carrying current, working with electrical equipment that lacks the label for safety inspection, electrical equipment that has not been properly grounded, working with electrical equipment on damp floors or other sources of wetness, static electricity discharge, using metal ladders to work on electrical equipment, working on electrical equipment without ensuring that the power has been shut off or Lighting strikes. (Goetsch, 2005).

Types of Electrical Faults: Together, current and voltage supply the power we use every day. Any electric current that exceeds the rating of the circuit is an Over current. When the current exceeds the rated current carrying capacity of the conductor, it generates excess heat that can damage insulation. If insulation becomes damaged, personnel may be severely injured and equipment or property compromised or destroyed. Over currents can be divided into two categories: overloads and short circuits. An Overload is defined as an over current that is confined to the normal current path. Excessive connected loads, stalled motors, overloaded machine tools, etc. can overload a circuit. Most conductors can carry a moderate overload for a short duration without damage. However, if the overload persists for too long, excessive heat will be generated ultimately causing insulation failure. This may result in fires or lead to a short circuit. A Short Circuit is any current not confined to

the normal path. The term comes from the fact that such currents bypass the normal load. Usually, when a current is greater than 6 times (600%) the normal current, it should be removed as quickly as possible from the circuit. Short circuits are usually caused by accidental contact or worn insulation and are more serious than overloads. Damage occurs almost instantly. Examples of Short Circuits include two or more conductors accidentally touching, someone touching or dropping tools across energized conductors or accidental connection between energized conductors and ground. Such ground faults may vary from a few amperes to the maximum available short circuit fault current. (Littelfuse, 2005)

Hazards of Electricity: Electrical shock, a basic understanding of the shock hazard, along with the physiological effects on the human body, is vital to an understanding of electrical safety. Electrical shock occurs when a person's body completes the current path between two energized conductors of an electrical circuit or between an energized conductor and a grounded surface or object. Essentially, when there is a difference in potential from one part of the body to another current will flow. The effects of an electrical shock can vary from a slight tingle to immediate cardiac arrest. The severity depends on several factors: Body resistance (wet or dry skin is a major factor of resistance) · Circuit voltage · Amount of current flowing through the body · Current path through the body · Area of contact · Duration of contact. (Neitzel, 2005)

Electrostatic Hazards: it may cause minor shocks. Shocks from static electricity may result from single discharge or multiple discharges of static. Sources of electrostatic discharge include the following: briskly rubbing a nonconductive material over a stationary surface. Moving large sheets of plastic, which may discharge sparks or the explosion of organic and metallic dusts. Conveyor belts, vehicle tires rolling across a road surface, and friction between a flowing liquid and a solid surface (Goetsch, 2005).

Electrical Hazards to Humans: the greatest danger to humans suffering electrical shock results from current flow. The severity of injury with electrical shock depends on the dosage of current as show in the table in annex (6)

Reducing Electrical Hazards: the Palestinian act has many conditions ensure safety from electricity hazards as follow: first, general conditions: the electrical current must be shut off before any maintenance work or electrical work with precautions from turning the current accidentally during the work. When working with electrical equipment for maintenance the worker should wear special personal protective equipment from electricity. When working on high voltage source there should be two persons who have good knowledge of electrical safety and can perform cardio pulmonary resuscitation. Second, the dynamic electricity: all the electrical wires should be in the right thickness and from the appropriate material kind to tolerate the severity of the current passing into it, and all of it should be isolated and protected from the sun, heat, or sharp objects. All the electrical wires should be secured in specific paths in safe method. The ground cables are covered and protected form water and sewage and should be pointed. Every electrical circle should has ground wire, and circuit breaking. The electricity control board should be outside especially outside the rooms with steams, gases, dusts, or any flammable materials, and should be in well-closed cabinet with outside control handle. Third, the electrical equipment: These equipment should be in good safe condition. All of them should be grounded. Precaution signs should be nearby the equipment with high voltage current. All the persons maintaining the electrical equipment should be with high skill and good training, and no work done till electricity is off. Fourth, the control board: it should be in safe place, connected to the equipment or circuits in safe way, and easy to reach. All the wires attached to it are in good condition. Isolated surfaces should be around the control board. Fourth, the static electricity: the static electricity should be discharged in continuous

bases especially from the places with gases, smokes, of flammable substances with one of the following methods: all the metal equipment which is around high voltage source should be grounded, humidity rates should be suitable and using static electricity collectors. The workers wear shoes that discharge static electricity to the ground. (Pal, act, 2004)

OSHA's standards relating to electricity are divided into two categories: design of electrical systems and safety related work practices. These general precautions for electrical hazards: ensure that power has been disconnected from the system before working with it. Test the system for de-energization. Capacitors can store current after power has been shut off. Allow only fully authorized and trained people to work on electrical systems. Do not wear conductive material such as metal jewelry when working with electricity. Screw bulbs securely into their sockets. Ensure that bulbs are matched to the circuit by the correct voltage rating. Periodically inspect insulation. If working on hot circuits use the buddy system and wear protective clothing, do not use fuse with a greater capacity than was prescribed for the circuit. Verify circuit voltage before performing work. Do not use water to put out an electrical fire. Check the entire length of electrical cord before using it. Use only explosion proof devices and nonspeaking switches in flammable liquid storage areas. Discharge capacitors before working on the equipment. Enclose uninsulated conductors in protective areas. Use fuses and circuit breakers for protection against excessive current. Provide lighting protection on all structures. Train people working with electrical equipment on a routine basis in first aid and cardio pulmonary resuscitation (Chao and Hanshaw, 2002).

2.1.3.4.5 Fire Hazards: fire hazards are conditions that favor fire development or growth. Three elements are required to start and sustain fire: oxygen, fuel, and heat. Fire or combustion is a chemical reaction between oxygen and a combustible fuel. Combustion is the process by which fire converts fuel and oxygen into energy, usually in the form of heat.

For the reaction to start, a source of ignition, such as a spark or open flame, or a sufficiently high temperature is needed. Given sufficiently high temperature, almost every substance will burn. Ignition temperature or combustion point is the temperature at which a given fuel can burst into flame (Goetsch, 2005).

Fire Danger to the Humans: fire danger can be to the humans as burns or death, and economic loss as the damage of equipment, materials, buildings, costs of medical treatment and insurance, and the cost of cease of production. (El Kharabsha, El Amery, 2000)

Detection of Fire Hazards: many automatic fire detection systems are used in industry today. These systems can warn of the presence of smoke, radiation, elevated temperature, or increased light intensity (Goetsch, 2005).

Causes of Fires: Oxygen is always available from the air. Sources of ignition cannot be completely eliminated. They are likely to include: frictional heating (hot bearings); sparks (from hand tools); static discharges; naked flames (on welding equipment or gas-fired plant); electrical sources (overloaded conductors); hot surfaces (steam pipes or infrared dryers); cigarettes and/or matches. Both the fuel and ignition sources should be controlled to minimize the risk of fire. Typically, problems arise from the following situations: poorly maintained equipment; welding and/or cutting of plant; faulty or misused electrical equipment; poor storage of packaging materials; poor storage or handling of flammable liquids and/or gases; inadequate site security; smoking and smoking materials. Once started, fires can spread rapidly. The following will contribute to rapid fire spread: poor housekeeping and accumulation of waste material; unsegregated storage of materials increasing fire hazard; excessive stocks of paper in production areas; unbanded, end-stacked reels of paper; lack of fire separation between floors or rooms; fire doors wedged or propped open; combustibility and fire spread characteristics of wall and ceiling linings;

poorly maintained fire-fighting equipment; inadequate/inappropriate fire detection and extinguishing equipment; inadequate provision of fire venting. The actions of workers are critical to the spread of fire. If the wrong extinguishers are used or staff fails to follow appropriate instructions then the situation will be considerably worse than it need be. (HSE, 2005)

Reducing Fire Hazards: The best way to reduce fires is to prevent them. A major cause of industrial fires is hot, poorly insulated machinery and processes. One mean of reducing a fire hazard is the isolation of the three triangle elements: fuel, oxygen, and heat. Fires may also be prevented by the proper storage of flammable liquids. Liquids should be stored as follows: in flame resistant buildings that are isolated from places where people work. Proper drainage and venting should be provided for such buildings. In tanks below ground level. Substituting less flammable materials is another effective technique for fire reduction. Several ignition sources can be eliminated or isolated from fuels: prohibit smoking near any possible fuels. Store fuels away from areas where electrical sparks from equipment, wiring, or lighting may occur. Keep fuels separate from areas where there are open flames. These include welding torches, heating elements, or furnaces. Isolate fuels from tools equipment that may produce mechanical or static sparks. Clean up spills of flammable liquids as soon as they occur. Properly dispose of the materials used in the cleanup. Keep work areas free from extra supplies of flammable materials. Have only what is needed on hand with the remaining inventory properly stored. Run electrical cords along walls rather than across aisles or in other trafficked areas. Cords that are walked on can become frayed and dangerous. Turn off the power and completely deenergize equipment before conducting maintenance procedures. Do not use spark or friction prone tools near combustible materials. Routinely test fire extinguishers (Goetsch, 2005).

Fire Extinguishing Systems: stand pipe and hose systems provide the hose and pressurized water for firefighting. Hoses for these systems usually vary from 1 inch to 2.5 inches in diameter. Automatic sprinkler systems are fixed extinguishing system because the sprinkles are fixed in position. Water is the most common fluid released from the sprinkles. Sprinkle supply pipes may be kept filled with water in heated buildings, in warmer climates; valves are used to fill the pipes with water when the sprinkles are activated. When a predetermined heat threshold is breached, water flows to the heads and is released from the sprinkles. Portable fire extinguishers are classified according to the types of fire that they can most effectively reduce. (Goetsch, 2005).

Categories of Fires and Extinguishers: Fires are categorized according to types of materials involved. Class A fires involve ordinary combustible materials such as paper, wood, cloth, and rubber and plastic materials. Class B fires involve flammable or combustible liquids, flammable gases, greases and similar materials, and some rubber and plastic materials. Class C fires involve energized electrical equipment where safety requires the use of electrically nonconductive extinguishing media. Class D fires involve combustible metals such as magnesium, titanium, zirconium, sodium, lithium, and potassium. Fire extinguishing agents are categorized by the type of fire they extinguish, that is, class A, class B, class C, or class D, extinguishers are used on corresponding types of fires. Some extinguishers can be used on different classes of fires, therefore, class A- B and class A- B- C extinguishers are available. Each type can be recognized as follows. An extinguisher for class A fires may be rated as 1-A, 2-A, 3-A, 4-A, 6-A, 10-A, 20-A, 30-A, or 40-A. A 4-A extinguisher will extinguish about twice as much fire as a 2-A extinguisher. Class B extinguishers are rated similarly. Class C extinguishers are tested only for electrical conductivity, however, no extinguisher gets a class C rating without a class A and/or class B rating. Class D extinguishers are tested on metal fires. The agent

used depend on the metal for which the extinguisher was designed. The extinguisher faceplate will indicate the effectiveness of the unit on specific metals. Fire extinguishers are distributed in the workplace so that the travel distance for class A extinguishers is 75 feet or less. Class B and D extinguishers require travel distance of 50 feet or less. Class C travel distance is based on the appropriate pattern for classes A or B. extinguishers shall be mounted and located so they are readily accessible. They require a monthly visual check and an annual maintenance check in addition to any applicable hydrostatic testing.(friend and kohn.2007)

Annex (7) shows the Fire Extinguisher Characteristics.

Occupational Safety and Health Standards Regarding Fire Hazards:

The OSHA regulations for emergency action plans (EAPs) and fire prevention plans (FPPs) apply to organizations classified by OSHA as general industry. This includes all businesses except those in the construction, shipbuilding, agricultural, and mining industries. Businesses with more than ten employees must have written emergency action plan and written fire prevention plans. Businesses with less than ten employees, the elements of the plan can be communicated orally. An EAP details the actions employees are to take in the event of an emergency. An emergency may include bomb and violence threats, accidental releases of toxic vapors, chemical spills, fires, or explosions. The plan should address all potential emergencies that can be expected in the workplace. The primary objective of the EAP is to have all employees know how to: exit to safety, alert fellow employees, notify the appropriate emergency resource agency. The EAP must include, as a minimum, the following elements: Emergency escape procedures and procedures to be followed by employees who remain to perform critical plant operations. Also must include procedures to account for all employees after an emergency evacuation and rescue and medical duties for those employees who are to perform them. In addition to

preferred means for reporting emergencies, and names or regular job titles of persons or departments to be contacted for further, information or explanation of duties under the plan. The Fire Prevention Plan (FPP) is a written plan intended to educate employees about specific hazards of their jobs. In essence, the FPP is an extension of the EAP. It is recommended that employees responsible for the EAP also administer the FPP.

The FPP must include, as a minimum, these elements: a list of the major workplace fire hazards and their proper handling and storage procedures, potential ignition sources and their control procedures, and the type of fire protection equipment or systems that protect against these hazards. In addition to names or regular job, titles of personnel responsible for maintenance of equipment and systems installed to prevent or control ignitions or fires

Also must include names or regular job titles of personnel responsible for control of fuel source hazards and guidelines for proper housekeeping procedures. In addition to guidelines for training employees in the fire hazards of the materials and processes to

which they are exposed plus procedures for preventive maintenance of equipment and systems installed on heat producing equipment (LCD, 1999)

Training: To minimize the risk to people in case of fire, it is essential that they all receive adequate fire safety training appropriate to their role. Fire safety training can be broadly divided into four types – induction, basic, refresher and training of key workers. Induction training should be given to all new staff before they start work and should include an explanation of evacuation procedures, method of raising the alarm and any rules concerning smoking. They should be made familiar with the escape routes from any place where they have to work to specified assembly points. This could be done by walking along the routes or by adequate signs and written information. Basic and refresher training should be given to all staff, preferably at least twice a year, but at least once a year. The

training should cover the following points: the action to be taken on discovering fire; the action to take on hearing the fire alarm, including evacuation and roll-call procedures; the location of fire alarm call points and how to raise the alarm; how the fire brigade is called (unless this is to be done only by designated staff); the location and use of fire equipment and the dangers of using the wrong type of extinguisher; knowledge of escape routes including the operation of any special emergency door fastenings and any stairway not in regular use; location and identification of fire doors and their importance in restricting fire spread and protecting escape routes; stopping machines and processes and isolating power supplies where appropriate. Personal protection must be paramount; warning against stopping to collect belongings or re-entering buildings. Training of key workers should apply to certain categories of staff. Every person identified in the emergency plan as a person responsible for supervising and controlling putting the emergency plan into effect and conducting fire drills should have access to the risk assessments and to the emergency plan. They should also be given additional instruction in matters that will be their particular responsibilities over the above basic training. Specific aspects of training will include the supervision of evacuation and roll-call procedures, the control of contractors and the safety of visitors in the event of fire and liaison with the local authority fire brigade. These key personnel need to be clear how they fit into the overall emergency plan. Key personnel should receive refresher training at appropriate intervals. A practice fire drill should be carried out twice a year. It is a good exercise to simulate conditions in which one or more exits or escape routes from the building obstructed. During these drills a member of staff, who is told of a supposed outbreak of fire, should operate the fire alarm. The fire routine should then be followed as fully as circumstances permit. The special needs of employees who have disabilities and/or sensory impairments should receive

particular attention. The practice fire drill should be part of management's consideration and scrutiny of the quality of training. (HSE, 2005, ^a)

Exit Routes: An exit route is a continuous and unobstructed path of exit travel from any point within a workplace to a place of safety. An exit route consists of three parts: Exit access – portion of an exit route that leads to an exit. Exit – portion of an exit route that is generally separated from other areas to provide a protected way of travel to the exit discharge. Exit discharge – part of the exit route that leads directly outside or to a street, walkway, refuge area, public way, or open space with access to the outside. Normally, a workplace must have at least two exit routes to permit prompt evacuation of employees and other building occupants during an emergency. More than two exits are required, however, if the number of employees, size of the building, or arrangement of the workplace will not allow employees to evacuate safely. Exit routes must be located as far away as practical from each other in case one is blocked by fire or smoke. Exit routes must be permanent parts of the workplace (OSHA, 2003)

2.1.3.4.6 Hygiene Conditions in Workplace: As mentioned earlier, the workshops are treated as workplace and what applied for workplace should be applied to the workshops of the vocational training centers. The Palestinian act for the year 2000 has raised some hygiene conditions, which should be available in the workplace for the health of the workers. First it stated that all the places, machines, and equipment used by the workers should be maintained regularly and thoroughly and to be maintained clean all the times. The hygiene conditions are conditions regarding the drinking water, bathrooms, dinning rooms, and cloths changing rooms. Regarding drinking water, a source of good quality drinking water should be available and enough to the number of workers. The bathrooms should be appropriate and special ones for male and female. Numbers of bathrooms are relevant to the number of workers as one bathroom for every twelve workers. Every

workplace should provide dinning room with enough space for the workers and away from work area. These dinning rooms should have source of water for hands washing and garbage baskets. The workplace should have a special place for cloths changing where cloth changing is necessary. Each worker should have his won cabinet (pal. Act, 2000).

The Vocational Trainer: the vocational trainer is a very important element of the vocational training. There are three categories of the vocational trainers, the practical trainers, the technical trainers, and the technical educators. In this study, the researcher will focus on the practical trainers as they are the trainers who have the duty of fulfill the practical part of the training program and they are the ones who work in the training workshops. They also teach the theoretical part of the practical tasks. They have part in the production processes through the training. They also perform the regular and urgent maintenance of the training equipment. The vocational trainer has several important tasks including: his role in the practical training, in teaching theoretical parts, as evaluator of the training, a counselor and a guidance, supervisor of productivity, a trainer of safety and maintenance. The last task he has the following duties: prepare schedules of the needs of the training. Store management, does the regular maintenance of training machines and equipment, prevention of occupational hazards in the training workshop by recognizing them and educate the trainees about them and by using the personal protective equipment and the use of safety guard on machines. Perform first aid in cases of injuries, fill in incidents reports and use fire distinguishers. Among several abilities the trainers should have is the complete knowledge of the occupational safety and health especially the recognition of the occupational hazards and their preventive measures. (Jaber, 2001,^b)

There are several essential characteristics the vocational trainer should have as a trainer. These are the willing to train, good knowledge of the training subjects, familiar with the training methods, realizes the concept of learning, good personality as trainer, and has the

ability to perform good communication with others. The trainer also must have the following skills: supervision, training, and specialist in his work field. The supervision skills mean he has the skills to run the training process including constructing and developing the training programs and materials. The training skills mean planning and applying the training activities and evaluating them plus guiding the trainees. (jubran,2006)

From the previous paragraphs, the importance of good-trained trainer is very clear. As mentioned, the trainer is responsible for training the trainees regarding the occupational hazards in their work and how to control it. In addition, he is responsible for preparing the training program. This is why that the trainer should be in the first place is familiar with the occupational hazards in his work and trained how to train it to his trainees.

2.1.4 Vocational Training:

In general, when the term “training” is used together with the adjective “vocational” in a conversation or in a text, it refers to a certain type of training whose main objective is preparing people for work. Probably, this is the simplest and most commonly used definition of vocational training. A general and internationally accepted definition states that vocational training is an activity directed to identifying and developing human capabilities for a productive and satisfying working life. According to it, those who take part in vocational training activities should be able to understand and, individually or collectively, to influence working conditions and the social environment. It is possible to say that vocational training is simultaneously:

An educational activity oriented to provide the necessary knowledge and skills to perform a particular job post, an occupation, or a professional activity in the labor market. At the same time, it acts as a supplementary form of other types of education by training people not only as workers but also as citizens.

The previous three topics make up the vocational training and its accomplishment give a successful vocational training and fulfill its objectives. (ILO, 2009)

Training : Training is a process of an individual interaction with practical experiences aiming to construct and developing wanted characteristics and capabilities(psychological, performance, and attitude skills) make him able to perform specific tasks and duties within specific circumstances and facilities.(Jaber,2001, ^a)

The UNRWA educational development center, Amman defined training as it is a planed and organized activity aimed to induce positive change in the individual's behavior, in the purpose of elevating his levels of performance and increasing his productivity and efficiency by helping him gain a group of knowledge, skills and attitudes, by which he can perform a task he could not do before or do it better. (jubran,2006)

Vocational Training: is an organized process by it, the individual can get specific and new skills, information, and attitudes or develop what he already has aiming to make wanted change in his practice and performance so he is able to perform specific tasks within completed work frame or group of works with limited degree of excellence(Jaber,2001)

Another definition of the vocational training is training, which takes place in special centers where the trainees prepared to become skillful workers with limited specific skills connected directly with the need of work market, which they will work in after the training. (Muhammed, 2002)

Other definitions: It is the practical and theoretical methods programs and activities, including conferences, seminars and workshops, which provide workers with the opportunity to improve their information and skills for enhancing their productivity or to

provide them with capabilities to qualify them for a certain occupation or transfer them from one occupation to another. Such training is conducted either as an in-house activity or at institutes or centers and other training facilities, which are designed for this purpose. It includes preliminary training, advanced training and re-training irrespective of its level and the method of providing it. (KOB, 1999)

According to the Arab center for human resources development, which is one of the Arab work organization institutions, vocational training has the following objectives: develop the physical, mental, and behavioral capabilities of the individuals. Increases self-esteem through work perfection and the ability to find the appropriate problem solvents. Increase the income through binding wages to the level of productivity and provide work opportunities. Increase the trust between the worker and the administration. Maintain the resources of the institution, which are the capital plus the work force and equipment. Improve the industry level and increase its cooperative ability by decreasing the cases of damages, which decline the productivity. Improve human relationships between the workers. Maintain the wanted quality of goods and services by reasonable process and the appropriate times. (El Zubay and el Junadi, 2003)

Types of Vocational Training: Also according to the same resource, vocational training has two types: the basic general training, which is training the beginners on the basics of the occupations and prepared generally to specific occupations needed in the projects. The other type is the specialist training which aims to improve the capabilities and their specialty in the production branches. This training is often done in the production institutions. (El Zubay and el Junadi, 2003)

Categories of the workers in the basic levels of work: limited skills worker, which includes the group of jobs, which need limited level of skills to be, performed which can be gained

in through short time training in job site or in vocational training institution. The period of training usually takes few weeks to few months.

Skilled worker, this category includes the group of jobs, which require skills of complete parts of this job. Usually these skills require special training in the vocational education institutions like the vocational training centers and work sites. (Jaber, 2001,^b)

The trainees of the vocational training centers in Gaza governorates come under these two categories.

Vocational Training in Palestine:

At the arrival of the Palestinian national authority PNA the vocational education and training system was fragmented, and there were a large number of training providers besides the PNA. In addition, the technical vocational education and training TVET system was small, has several sponsors, and displays a variety of format. To get rid of the fragmentation the PNA developed its own curriculum and adopted one strategy for the TVET system. This strategy enhances the focus on both the labor market and the technological progress through strengthening the relationship and interaction between TVET system's outcome, and the labor market need. This strategy aims to create a TVET system that is relevant, flexible, effective, accessible, sustainable, and which fulfils its general obligations towards the Palestinian society. Today, there are more than (200) institutions in the West Bank and Gaza providing short and long-term training programs. These include vocational secondary schools, vocational training centers, cultural centers, societies and charitable organizations, and agricultural and economic development centers. In addition to these institutions come the 19 community colleges providing postsecondary education, 5 of them is technical colleges. These institutions are run by several bodies include: The ministry of Education and Higher Education, The Ministry of Labor, the

Ministry of Welfare and Social Affairs, UNRWA, Several Philanthropic associations, and large number of religions and profit organizations, in addition to private and public organizations. (Hilo, 2007)

2.1.5 Occupational Safety and Health Standards:

Occupational safety and health standard” means a standard which requires conditions, or the adoption or use of one or more practices, means, methods, operations, or processes, reasonably necessary or appropriate to provide safe or healthful employment and places of employment(OSHA,2004)

Perhaps the most debilitating experience one can have on job is to be involved in, or exposed to, a work related accident or illness. This can be physically and psychologically incapacitating for the victim, psychologically stressful for the victim's fellow workers, and extraordinarily expensive for the employer. In spite of this laws governing workplace safety are limited even the Palestinian law legislated several regulations regarding occupational safety and health. Even these legislations and regulations are fully clear and explained few of them are applied. These regulations apply to most employers. If an organization has even one employee, it is considered an employer. Vocational training is part of these legislations and regulations. The objectives of the occupational safety and health standards are to improve working environment and working conditions in order to ensure and maintain the working capacity of employees as well as to prevent occupational accidents and diseases and eliminate other hazards from work and working environment to the physical and mental health (Alli, 2001)

2.1.5.1 ILO Instructions and Regulations:

The international labor organization (ILO) in its general conference number 155 in 1981 had decided upon the adoption the convention of occupational safety and health. The article number 4 of the convention states the following:

- 1- each member shall, in the light of national conditions and practice, and in consultation with the most representative organizations of employers and workers, formulate, implement and periodically review and coherent national policy on occupational safety, occupational health and the working environment.
- 2- The aim of the policy shall be to prevent accidents and injury to health arising out of, linked with or occurring in the course of work, by minimizing, so far as reasonably practicable, the causes of hazards inherent in the working environment.

The article number 5 of this convention states that the policy referred to in article 4 of this convention shall take account of the following main spheres of action in so far as they affect occupational safety and health and the working environment:

- a) Design, testing, choice, substitution, installation, arrangement, use and maintenance of the material elements or work (workplaces, working environment, tools, machinery and equipment, chemical, physical and biological substances and agents, work processes).
- b) Relationships between the material elements of work and the persons who carry out or supervise the work, and the adaptation of machinery, equipment, working time, organization of work and work processes to the physical and mental capacities of the workers.

- c) Training, including necessary further training, qualifications and motivations of persons involved, in one capacity or another, in the achievement of adequate levels of safety and health.
- d) Communication and co-operation at the levels of the working groups and the undertaking and at all other appropriate levels up to and including the national level
- e) The protection of the workers and their representatives from disciplinary as a result of actions properly taken by them in conformity with the policy referred to in the article 4 of this convention.

The Article 14 of The Same Conviction States The Following:

Measures shall be taken with a view to promoting, in a manner appropriate to national conditions and practice, the inclusion of questions of occupational safety and health and the working environment at all levels of education and training, including higher technical, medical and professional education, in a manner meeting the training needs of all workers (ILO, 1981). ILO convention (no. 155) concerning occupational safety and health and the working environment, 1981

- The ratification status of ILO conventions related to occupational safety and health and its relationship with reported occupational fatality rates:

In a study conducted to assess the relationship between ratification of OSH related ILO conventions and the reported occupational fatality rates, taking into account possible confounding factors including differences in the economic status of countries. As of April 2004, there were 177 member states of the ILO. Ratification status of each member state for each convention was extracted from the ILO website. Reported occupational fatality rates could be obtained from 90 of those member states. For each 17 conventions related to OSH, the mean occupational fatality rates were compared between the group of states that

had ratified and the group of states that had not ratified the particular conventions. In 79.4% of the comparisons, non-ratifying states had significantly higher fatality rates than ratifying states (Wilson, 2007).

2.1.5.2 The Local Occupational Safety and Health Act:

In the year 2000, the Palestinian act for occupational safety and health was performed but not completely applied. It covers the occupational hazards, the medical check up of the workers, the sanitary conditions in the workplace, work regulation, the first aid box in the workplace, accidents and occupational diseases reporting, safety conditions in the buildings, protection of employees from work hazards and illnesses, and the obligation of the employer to take every necessary steps and measures to prevent occupational hazards in the workplace. (Pal, act, 2004)

2.1.5.3 International Occupational Safety and Health Acts:

One of the most important acts regarding OSH is the act of the American occupational safety and health agency OSHA for the year 1970. The OSHA act applies to most employers. This includes all types of employers from manufacturing and construction to retail and service organizations. There is no exemption for small businesses. There are many OSHA requirements to which employers must adhere: fire protection, electricity, sanitation, air quality, machine use, maintenance, and repair, posting of notices and warnings, reporting of accidents and illnesses, maintaining written compliance programs, and employee training (Goetsch, 2005). The OSHA was created within the department of labor to: encourage employers and employees to reduce workplace hazards and to implement new or improve existing safety and health programs, provide for research in OSH to develop innovative ways to dealing with OSH problems, establish separate but dependent responsibilities and rights for employers and employees for the achievement of

better safety and health conditions, maintain a reporting and recordkeeping system to monitor job related injuries and illnesses, establish training programs to increase the number and competence of occupational safety and health personnel, develop mandatory job safety and health standards and enforce them effectively, provide for the development, analysis, evaluation, and approval of OSH programs (friend,2007)

The WHO Global Strategy on Occupational Health and Safety:

Priorities for global strategy are strengthening of international and national policies for health at work are promotion of a healthy work environment, healthy work practices, health at work, strengthening of occupational health services, establishment of appropriate support services for occupational health, development of occupational health standards based on scientific risk assessment, development of human resources, establishment of registration and data systems, and strengthening of research. (WHO, 2001)

2.1.6 Occupational Safety and Health:

Although safety and health are closely related, they are not the same. One view is that safety is concerned with injury causing situations, whereas health is concerned with disease causing conditions. Another view is that safety is concerned with hazards to humans that result from sudden severe conditions, health deals with adverse reactions to prolonged exposure to dangerous, but less intense, hazards. Both of these views are generally accurate (Goetsch, 2005).

Occupational Health is defined as the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations by preventing departures from health, controlling risks and the adaptation of work to people, and people to their jobs (ILO/WHO 1950). The importance of occupational health can be understood if we consider that half of the adult population workers are working in some kind of

industry, often under inadequate conditions. According to the international labor organization data, every year there take place: 270 million accidents at work (250 per second), 160 million occupational non fatal diseases, 2.3 million deaths related to work (5000 per day (ILO, 2008).

Industrial Hygiene: it is the art science devoted to the recognition, evaluation, and control of workplace health hazards (friend, 2007). Is a safety and health profession that is concerned with prediction, recognizing, assessing, controlling, and preventing workplace hazards that can cause sickness or serious discomfort to workers (Goetsch, 2005)

Industrial Hygienist: The code of the American academy of industrial hygiene describes the responsibilities of the industrial hygienist as follow: To ensure the health of employees. To maintain an objective approach in recognizing, assessing, controlling, and preventing health hazards regardless of outside pressure and influence. To help employees understand the precautions that they should take to avoid health problems. To respect employer's honesty in matters relating to industrial hygiene. To make the health of employees a higher priority than obligations to the employer (Goetsch, 2005)

Young people are more at risk of harm from work for several reasons. They lack experience and maturity, awareness of risks, and skills and training. They may be unaware of their rights and employer's duties regarding health and safety. And they may be not able to speak out their problems and try to please their employer. They therefore need to be placed in safe and suitable jobs that are matched to their skills and mental and physical abilities and given adequate training and supervision. However, the majority of occupational safety and health risks are preventable, by applying the principles of risk assessment and putting in place the necessary preventive measures. In addition, by keeping young workers safe and by training and educating them properly, employers can

benefit from their energy and motivation, while at the same promoting a preventive culture. To support this, the training workshops in the vocational training centers should apply the principles of risk assessment and risk prevention measures by applying the occupational safety and health standards (EASHW, 2006).

2.1.6.1 Importance of OSH in the Vocational Training Centers:

The trainees of these training centers are the future workers in the labor market. Most of them applied to the vocational training so they can improve their living conditions. Most of them will work in the informal sector. Workplace health risks are high in the informal sector and small industry that are key arenas of action on poverty alleviation, where people can work their way out of poverty. In particular, occupational health programs that prevent the breadwinner becoming incapacitated prevent the common scenario whereby families become impoverished as the result of an occupational disease or accident (WHO, 2001)

Inadequate safety and health standards and environmental hazards are particularly evident in the case of the informal sector. Informal sector's workers do not have the necessary awareness, technical means and resources to implement health and safety measures. The protection of the health and welfare of workers in the informal sector is a challenge that should be faced with an integrated approach to health promotion, social protection and employment creation. Innovative means to prevent occupational accidents and diseases and environmental hazards need to be developed through cost-effective and sustainable measures at the work-site level to allow for capacity-building within the informal sector itself (Forastieri, 1999). When the trainees trained in safe and healthy environment because of the applying of the OSH standards and they are trained on safe work practices plus safe measures to avoid accidents, injuries, and illnesses, they will apply their training on their work field which will improve the health of workers and their productivity. However,

evidence suggests, that with the appropriate support, informal sector workers can move from a situation of mere survival to a stronger economic position enhancing their contribution to economic growth and social integration, as well as participating in the improvement of their own working and living conditions (Forastieri, 1999).

Workplace Accidents, Injuries, and Occupational Diseases:

Work accident defined as unexpected event leads to injury to the worker, damage to the materials, or both (Kharabsha and Amri, 2000)

Current estimates point to some 2 million men and women who lose their lives through occupational accidents and work-related diseases each year (ILO, 2002).

Occupational Diseases: the WHO defined occupational disease as any disease most abundant between workers in specific occupation rather than others or any toxic case caused by a material used in specific occupation or group of occupations rather than others. Alternatively, the disease that caused by an occupation or the occupation leads to its occurrence. The difference between the injury and occupational disease that the effect of injury appears immediately after its occurrence, while the occupational disease takes long period of continuous direct or indirect exposure to the causing agent. The injury can happen to any worker but the occupational disease happen only to the workers who have the tendency to get the disease (Jaghbier and Awad, 2003, ^b)

The most frequent injuries to specific parts of the body are: back, legs and fingers, arms and multiple parts of the body, trunk, hands, eyes, head, and feet, neck, toes, and body systems (Goetsch, 2005)

Causes of Occupational Accidents: Reasons related to the physical, mental, psychological, and social factors of the worker. Unsafe working conditions as

inappropriate lighting, poor ventilation, noise, vibrations, and pollution. Work malpractices such as improper or wrong information, worker is unfit to the job, irresponsibility, and poor technical supervision. Reasons related to the work tools and equipment such as lack of maintenance, lack use of safeguards in the machines, poor electrical wires, and unavailability of personal protective equipment(Jaghbier and Awad, 2003, ^b). All these reasons are avoidable by good training and proper applying of OSH standards.

Young workers are high-risk group for occupational injuries. However, the injuries of young workers reported as less often fatal than injuries of older workers (Salminen, 2004).

Medical Check Up: the Palestinian act for occupational safety and health has specific materials on the medical check up of the employees prior to the employment and after specific periods according to the type of work. in addition, it specifically stated that the vocational trainee should be medically appropriate for the type of training so, should be medically checked prior to the training program (pal, act, 2004)

First Aid in Workplace:

The Palestinian act number 17 for the year 2000 states that every employer has to provide first aid box or more with its materials in the workplace. The materials include medications and tools needed for first aid procedures. The first aid box should be away from any source of danger and reached easily. The materials which should be in the box are: gauze bandage, plaster roll, crepe bandage, cotton, sterile eye pads, triangular bandage, tourniquet, scissors, antiseptic solution, analgesic, burns ointment, first aid plaster, thermometer, and examination gloves (pal. Act, 2000)

Personal Protective Equipment PPE: they are equipment used by the workers to protect them from the occupational hazards in their jobs and work environment to protect them from work related injuries and diseases (Rawashda, and Fashah, 2003)

Before choosing, the PPE first should identify the type of occupational hazard and the conditions of the work environment, determined the level of protection needed, easily used and stored, estimating the costs of the PPE and the long of usage period, and availability of maintenance to the PPE (Rawashda, and Fashah, 2003)

Types of PPE: the type of PPE depends on the part of the body needed to be protected such as eyes, head, face, feet, and the whole body. Each part of the body has several types of PPE according to the type of occupational hazard and the level of protection needed (Rawashda, and Fashah, 2003)

OSHA Regulation Regarding PPE: Employers have basic duties concerning the provision and use of personal protective equipment (PPE) at work. The main requirement of the PPE at Work Regulations 1992 is that personal protective equipment is to be supplied and used at work wherever there are risks to health and safety that cannot be adequately controlled in other ways. Anyone using PPE must be trained and instructed how to use it properly and employer makes sure they do this. In addition, anyone using PPE should be aware of why it is needed, when to be used, repaired or replaced and its limitations. Employees should be checked regularly that PPE is being used. Safety signs can be useful reminder to wear PPE. The Regulations also require that PPE: properly assessed before use to ensure it is suitable; maintained and stored properly; provided with instructions on how to use it safely; and used correctly by employees (HSE, 2005, ^b).

Chapter 3: Methodology

This chapter presents the study methodology; demonstrates the study design, study population and ethical issues that were considered. In addition, it presents the instruments, which were used in the study, its validity, data collection process, data process and analysis, in addition to the limitations of the study.

3.1 Study Design

We are conducting a descriptive study to determine the occupational safety and health standards, which should be available in the vocational training centers in Gaza Strip. A checklist constructed to assess the levels of application of the occupational standards in the vocational training centers included in the study. A questionnaire also constructed to assess the level of knowledge of the trainers in these vocational centers regarding the occupational safety and health standards in centers.

3.2 Study Setting:

All the workshops in the vocational training centers in Gaza Governorates that meet the operational definition, these centers are two UNRWA centers and four centers belong to the Ministry of Labor, two NGO centers, and five centers belong to the Ministry of welfare.

3.3 Study Population:

All the trainers of the vocational training centers in Gaza Governorates who meet the operational definition were included in the population sample. The Ministry of Labor centers has total number 34 trainers in four centers. The UNRWA centers have total number of 40 trainers in two centers. The NGO centers have total number of 10 trainers in two centers. The ministry of welfare has 25 trainers in five centers.

3.4 Sample Population:

Trainers: Since the number of the trainers is small, all the trainers were selected in the study.

Workshops: All the workshops of the vocational centers.

3.5 Eligibility Criteria

3.5.1 Inclusion Criteria

All the vocational training centers in Gaza governorates that provide vocational training and are not considered high education institution.

Trainers who have more than one year experience.

3.5.2 Exclusion Criteria

The vocational training centers that considered high education institution.

Trainers who have less than one year experience.

3.6 Study Tools

In this study three study instruments used. These instruments are:

- 1- Questionnaire to assess the skill level of the trainers regarding the occupational safety and health.
- 2- Check list to assess the occupational safety and health standards in each workshop.
- 3- Different measurement instruments used to measure and assess the physical environment of the workshops as heat, noise, and illumination.

3.6.1 Questionnaire:

A self well constructed questionnaire, easy to read, containing questions covering all the dimensions of the occupational safety and health standards of the workplace and dimensions of the vocational training and factors related to the topic will be used.

Generally, it divided to:

- General personal data.
- Knowledge of the subjects about effect of exposure to the occupational hazards.
- Knowledge of the subjects regarding the occupational hazards.
- Questions regarding any history of any injuries or physical signs and symptoms.

3.6.2 Checklist:

A checklist constructed after reviewing different workplace checklists. The various occupational safety and health standards were included in the checklist. The checklist has several dimensions. Each one has several checkpoints. The dimensions are: fire hazards, electrical hazards, physical hazards, chemical hazards, first aid, floor of the workshop, machines and equipment, waste disposal, indoor environment, personal protective equipment, store, hand tools, emergency plan, workplace, and hazardous materials.

3.6.3 Instruments:

Three measurement instruments were used. These instruments measure the physical conditions in the workshop such as the temperature, noise, and illumination. The instrument that measures the temperature is called hygrometer. The instrument measures the noise is called sound level meter. Finally, the instrument measures the illumination is called luxmeter. These instruments were taken from UNRWA Gaza training center.

3.7 Reliability of the Research:

To increase the reliability in this research the following were done:

- Training the data collectors. Three occupational safety and health technicians were trained on data collection and how to fill the questionnaire and the checklist.

-Standardization of the tools. The questionnaire and checklist were sent to few experts. Few changes were done.

-Unifying the implementation procedures.

-Re-collection of 5% of the study.

3.8 Validity:

Validity is defined as "the extent to which a measuring instrument measures what is supposed to measure" (Mark 1996,). In general, validity is an indication of how sound the research is. More specifically, validity applies to both the design and the methods of the research. Validity in data collection means that the findings truly represent the phenomenon that claimed to be measured. When the instruments measure what they designed for, this is being considered of great importance for their reliability (<http://linguistics.byu.edu>).

3.8.1 Content Validity:

Content validity is defined as "the extent to which a test reflects the variable it seeks to measure" (Holm and Liewehyn 1986,). It were conducted before data collection by the help of experts to ensure relevancy, clarity and completeness. Content validity is a subjective estimate of measurement based on judgment rather than statistical analysis. In order to validate the instruments used, the designed questionnaire with a covering letter, title and objectives of the study were sent to experts from different backgrounds including researchers, public health experts in environment field. The experts will be were asked to estimate the relevance, clarity and completeness of each item; some questions were modified with the help of the supervisor.

In this study, the researcher improved validity by reviewing the questionnaires with group of experts.

3.9 Data Collection:

The researcher completed the questionnaires, explained to each subject the purpose and objectives of the study, and answered his /her questions in relation to the study. Each person individually was given a questionnaire to fill without writing a name or a number. The researcher trained few of occupational safety and health technicians who helped in the filling of questionnaires with the subjects and filled the checklists for the different workshops in the vocational training centers of the study. The researcher reviewed over the completed questionnaires and checklists to ensure completion of all information needed. The process of data collection continued for about 10 weeks.

3.10 Data Analysis:

After over-viewing the questionnaire, each one was coded, and the usable number of questionnaires was determined. This step was followed by designing an entry model using the Statistical Package for Social Sciences (SPSS) program. The author using the computer software entered the coded questionnaire. Cleaning of data was done, the data analyzed; frequency tables conducted for the study variables. Means and standard deviation were computed for the continuous numeric variables, reliability and validity of the instrument was tested. The checklists reviewed and compared with the occupational standards of the workplace and each item evaluated by the rate of application and degree of competency in preventing and controlling workplace hazards.

3.11 Response Rate:

About 95% of surveyed people answered the questionnaire properly and returned it in due time.

3.12 Period of the Study:

The study will be conducted in the period between (1st of February to 1st July 2011).

3.13 Ethical Considerations:

An official letter of approval to conduct the study obtained from Helsinki Committee.

Every participant provided with an explanatory form about the study including the purpose of the study. Confidentiality of information insured. Consent form obtained from each participant in the study. All the ethical concepts were considered. Each participant's right to participate or not was addressed in the study.

3.14 Limitations of the Study:

Lack of resources and literature related to the study in Palestine.

- budget
- limited Local and regional Literature.
- Inadequate data on OSH issues.

Chapter 4 Results and Discussion

Descriptive Analysis

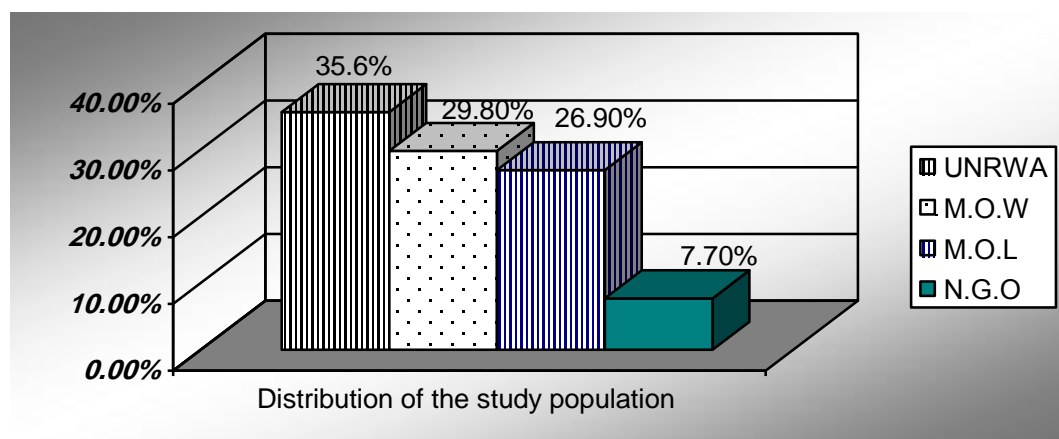
Self-administered Questionnaires

4.1 Distribution by the Provider:

Table 1: Distribution of the study population by provider of the service.

Provider	Center	No.	%
UNRWA	GTC	34	32.7
	KYTC	3	2.9
	Subtotal:	37	35.6
M.O.W	Gaza social center	8	7.7
	Khanyounis social center	2	1.9
	Dier el balah social center	7	6.7
	Rafah social center	4	3.8
	Biet lahia social center	10	9.6
	Subtotal:	31	29.8
M.O.L	Al Imam el shafie training center	10	9.6
	Khanyounis training center	7	6.7
	Dier el balah training center	6	5.8
	Rafah social center	5	4.8
	Subtotal:	28	26.9
N.G.O	Gaza training	5	4.8
	El Gararh	3	2.9
	Subtotal:	8	7.7
Grand Total:		104	100.0

The study results show that UNRWA is the vocational training, which has the highest number of trainers with percentage of 35.6%. There are two UNRWA centers one in Gaza city the other one is in the south in Khanyounis city. Ministry of welfare is next with percentage of 29.8%. MOW has five centers distributed in the strip from north to the south. It has one center in biet lahia, in Gaza city, in Dier el balah, in Khanyounis, and in Rafah. Next, comes the ministry of labor with percentage of 26.9% and four centers. One is in Gaza city, in Dier el balah, in Khanyounis, and in Rafah. The least percentage 7.7% goes for the NGOs with two centers one in Gaza city the other on in the south in el Gararh. Graph number 1 shows this distribution.



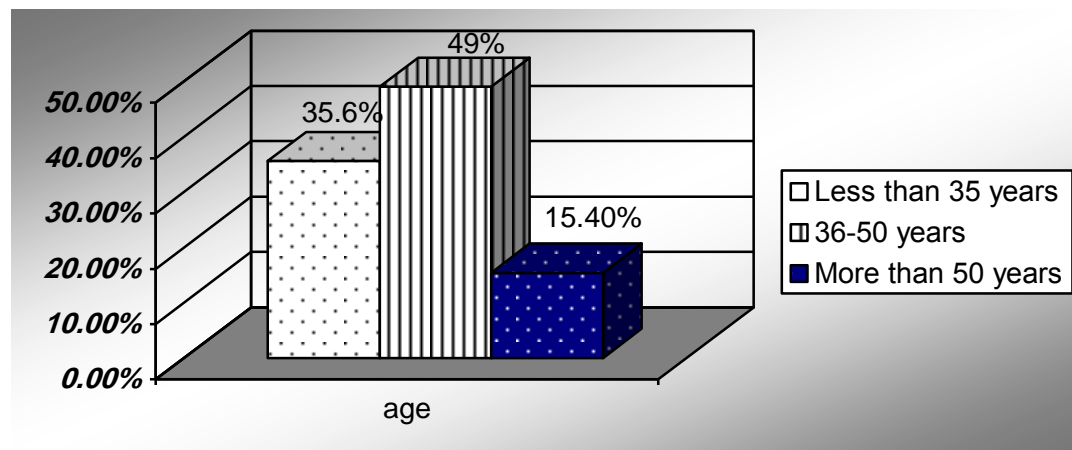
Graph 1: Distribution of the study population by provider

4. 2 Distribution By The Socio- demographic Variables:

Table 2: Distribution of the study population by the socio- demographic variables

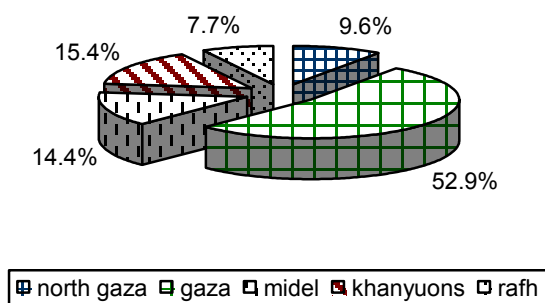
Distribution by area	Frequency	Percent
North Gaza	10	9.6
Gaza	55	52.9
Middle	15	14.4
Khanyounis	16	15.4
Rafah	8	7.7
Distribution by age		
Less than 35 years	37	35.6
36-50 years	51	49.0
More than 50 years	16	15.4
Distribution by sex		
Male	95	91.3
Female	9	8.7
Distribution by experience years		
1-5	27	26.0
6-10	21	20.2
11-15	19	18.3
More than 15	37	35.6
Distribution by area		
North Gaza	10	9.6
Gaza	55	52.9
Middle	15	14.4
Khanyounis	16	15.4
Rafah	8	7.7
Distribution by education years		
12 and less	32	30.8
13 and more	72	69.2
Total	104	100.0

Graph number 2 shows the distribution by age. The highest percentage goes for the Middle group by 49%, which is between 36 and 50 years. The study also shows that 33.6% of the trainers are less than 35 years old. Trainer more than 50 years old account only for 15.4% of the total number of the trainers.



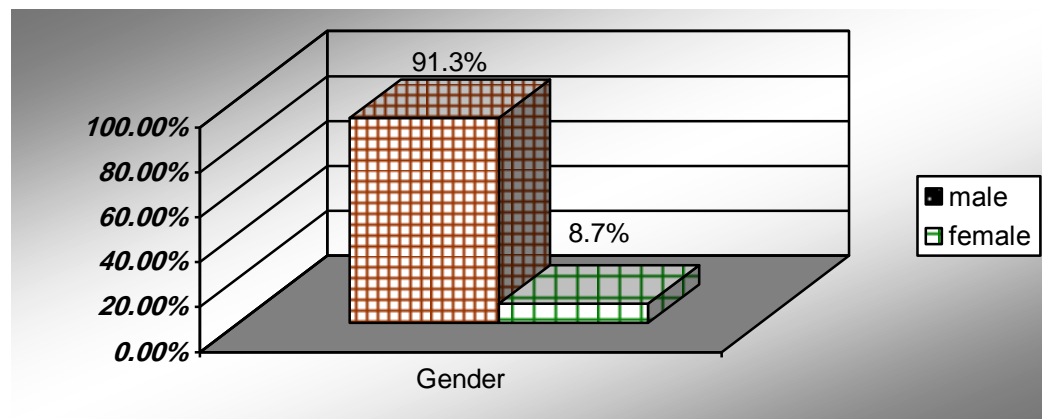
Graph 2: Distribution of study population by age

Graph 3 describes the distribution by Gaza governorates from north to south. Gaza governorate has the highest number of vocational training trainers with 50.9%. This percentage distributed in four centers. Theses centers are UNRWA Gaza training center, MOW Gaza social training center, MOL El imam El shafei training center, NGO Gaza training center. UNRWA Gaza training center has the highest number of vocational trainers. Khanyounis comes next with 15.4% of the total number of trainers. Third comes the Middle governorate with 14.4% of the total trainers. In the fourth place comes North Gaza governorate with 9.6%. Rafah comes last with 7.7%.



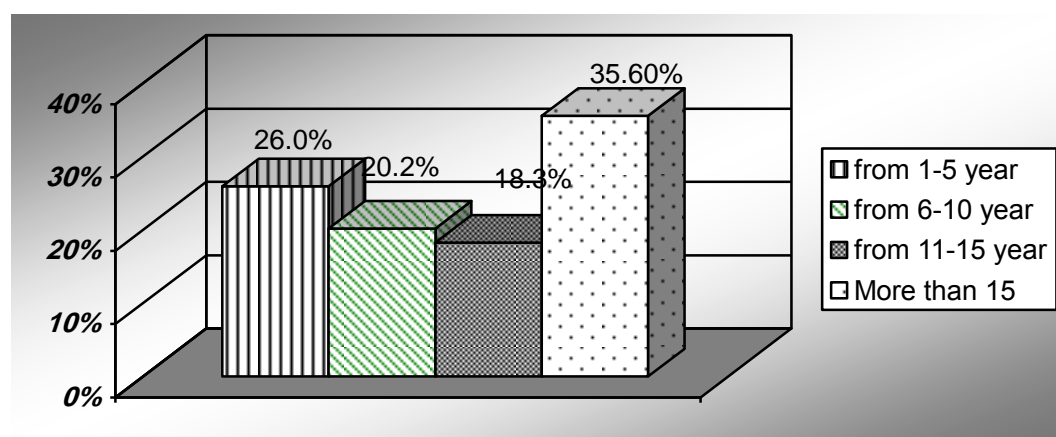
Graph 3: distribution of study population by the governorate

Graph 4 shows the distribution by gender. The males have percentage of 91.3% while the females have only 8.7%.



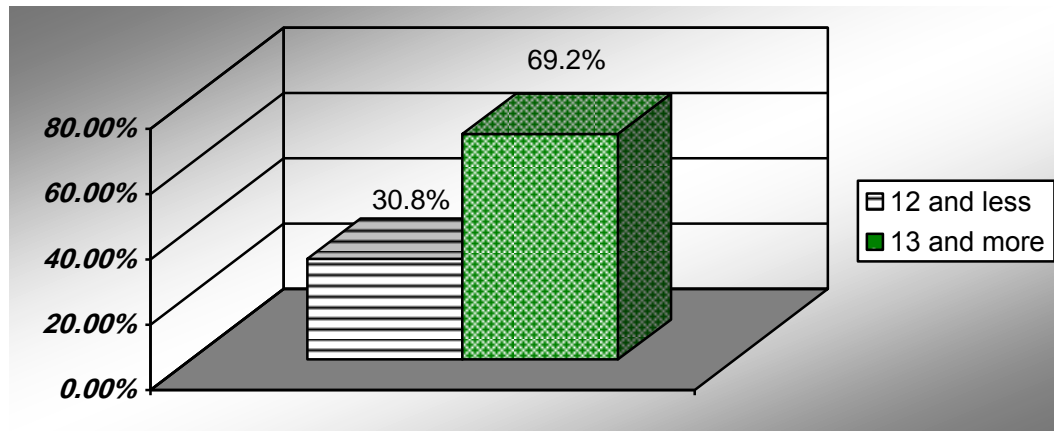
Graph 4: Distribution of the study population by gender

Graph 5 describes the distribution by experience years. 35.6% of the vocational trainers have experience years more than 15 years. In addition, 26% of the trainers have experience years five and less. These trainers need more training to fulfill their role as trainers including training on OSH related issues (Jaber, 2001, b). The trainer has the responsibility to train the topics of occupational safety and supervise his trainees on safe work practices (jubran, 2006). Trainers with 6 -10 years experience are 20.2%. Trainers with experience years 11- 15 are 18.3%.



Graph 5: Distribution of study population by experience years

The study results show that 69.2% of the vocational trainers have education years more than 12 years. Graph 6 shows this distribution.



Graph 6: Distribution of the study population by education years

4. 3 Distribution Of Study Population By The Parameters

4. 3.1 Training

Table 3: The first parameter "Training"

Items	Yes		No	
	No.	%	No.	%
Training on OSH	66	63.5	38	26.5
Training on Safe Work	73	70.2	31	29.8
Training on First Aid	70	67.3	34	22.7
Training on Fire Distinguishers	72	69.2	32	30.8

The study results show that more than halve of the vocational trainers had received training on occupational safety and health with 63.5%. The table shows that 70% of the trainers had

received training on safe work practices. However, the table shows that more than halve of the trainers had received training on safety related issues. In addition, this means that, about 30% of the trainers did not receive any training on OSH related issues. According to (Jaber, 2001, ^b) the trainers should have the complete knowledge of the occupational safety and health especially the recognition of the occupational hazards and their preventive measures. The trainer must be trained well regarding OSH issues because he is the responsible for train the trainees on OSH related issues. (Jubran, 2006)

4. 3.2 Personal Protective Equipment:

Table 4: Numbers & percentage of Personal Protective Equipment

Items	Yes		No	
	No.	%	No.	%
personal protective equipment (PPE) providing	82	78.8	22	21.2
Training of trainees on PPE	78	86.7	12	13.3
Regular use of PPE by trainees	68	75.6	22	24.5
follow up the trainees to use PPE	82	91.1	8	8.9
PPE appropriateness with training purpose	75	83.3	15	16.7

The study results show according to 80% of the vocational trainers, centers provide PPE to the trainees and the train them on its use. Also 91% of the trainers do follow up their trainees to use the PPE. 83.3% of the trainers believe that the PPE are appropriate to the training purpose. This is consistent with the OSHA regulations regarding the PPE, which, state that personal protective equipment is to be supplied and used at work wherever there are risks to health, and safety that cannot be adequately controlled in other ways. Anyone using PPE must be trained and instructed how to use it properly and employer makes sure

they doing this. In addition, anyone using PPE should be aware of why it is needed, when to be used, repaired or replaced and its limitations. Employees should be checked regularly that PPE is being used. Safety signs can be useful reminder to wear PPE. The Regulations also require that PPE: properly assessed before use to ensure it is suitable; maintained and stored properly; provided with instructions on how to use it safely; and used correctly by employees (HSE, 2005, ^b)

4. 3.3 The Institutional Characteristics:

Table 5: Numbers & percentage of Institutional Characteristics

Items	Yes		No	
	No.	%	No.	%
Provision of medical check up to the trainees	74	71.2	30	29.8
follow up medical check up to the trainees	26	25.0	78	75.0
Administration concern towards safety at work	95	91.3	9	8.7
Safety of work environment	90	86.5	14	13.5
Presence of OSH technician	27	26.0	77	74.0

According to more than 70% of the trainers, centers provide medical check up to the trainees prior to the training program, while only 25% of them provide follow up medical check up. This is inconsistent with the Palestinian act, which states that all the vocational trainees should be medically appropriate for the training type, so he or she should be checked medically prior to the training. In addition, it emphasizes on the necessity of the follow up medical check ups (pal. Act, 2000). Also according to more than 90% of the trainers, administrations in the centers show concern towards safety at work. The administration in the vocational training center is the employer. As all the OSH standards stated, the employer always has the responsibility to provide a safe work environment and carry on all

the necessary steps to prevent and control the occupational hazard in the workplace (pal, act, 2004). Eighty six percent of the trainers believe that their work environments are safe. Only 26% of the centers have special employee for safety and health.

4.3.4 The Training Environment:

4. 3.4.1 Machines and Equipment:

Table 6: Numbers & percentage of Machines and equipment

Items	Yes		No	
	No.	%	No.	%
Regular maintenance to equipment	84	80.8	20	19.2
Arrangement of machines and equipment	95	91.3	9	18.7
Protective barriers on machines	81	77.9	23	22.1
Use of barriers	75	83.3	15	16.7
Follow the trainees to use the protective barriers	82	91.1	8	8.9
Special store for the workshop	91	87.5	13	12.5
Supervision of trainees while working on machines	101	97.1	3	12.9
Safety of hand tools	102	98.1	2	1.9
Storage of hand tools	101	97.1	3	2.9

The study results show that according to more than 80% of the trainers, centers provide regular maintenance to the machines and equipment. This is consistent with the regulations in the Palestinian act regarding the machine hazards in the workplace (pal, act, 2004). OSHA regulations are also emphasis on the regular maintenance of the machines and equipment (OSHA, 2002). Machines and equipment arranged in the workshops in ways that prevent accidents according to 91% of the trainers. Palestinian act and OSHA regulation both highlighted the importance of appropriate arrangement of the machines and

equipment to prevent workplace accidents (pal, act, 2004) and (OSHA, 2002). Also according to more than 77% of the trainers, machines have protection barriers and only 83% of the trainers said that the barriers used. This means that more than 16% of the trainers do not care for the protection barriers. This is also consistent with the Palestinian act of OSH. It states on the use of safeguard on the machines with source of danger from movable parts and should be used all the time on the machine (pal, act, 2004). The table also shows that 91% of the trainers follow up their trainees on the use of the protective barriers and 97% of the trainers follow up their trainees while working with machines and equipment. According to 87.5% of the trainers, workshops have special stores and 97% of them said they have special safe store for the hand tools. Also 98% of the trainers think that the hand tools they use in the workshops are safe. The hand tools should be safe and appropriate for the work type (JMU, 2005).

4.3.4.2 Safety

Table 7: Numbers & percentage of safety

Items	Yes		No	
	No.	%	No.	%
Training on first aid skills for the trainees	40	38.5	64	62.5
First aid box with its materials in the workshop	86	82.7	18	17.3
Trainees training on the use of fire distinguishers	34	32.7	70	67.3
Workshop cleanness	104	100.0	-	-
Curriculum for occupational safety and health	91	87.5	13	22.5
Workshop changes regarding the occupational safety and health	79	76.0	25	24.0

In this table, we can see that only 38.5% of the trainers said that their centers provide training on first aid skills to the trainees and only 32.7% of them said that their centers provide training on the use of fire distinguishers to the trainees. All the workers especially the new ones should trained on fire distinguishers use (HSE, 2005, ^a) 82.7% of the workshops have first aid box with its materials. According to 100% of the trainers, workshops are clean. Regarding the curriculum of OSH in the training programs, 87.5% of the trainers said it is present in their training programs. The results show that 76% of the trainers believe that their workshops need changes regarding OSH.

4.3.4.3 Hygiene Conditions in the Center

Table 8: Numbers & percentage of Hygiene Conditions In The Center

Items	Yes		No	
	No.	%	No.	%
special place for cloths change	23	23.7	74	76.3
adequate rest periods	80	76.9	24	23.1
special places for trainees to rest	45	43.3	59	56.7
good quality drinking water	91	87.5	13	12.5
bathrooms enough for the trainees	61	58.7	43	41.3

Only 23.7% of the trainers said that the centers have special place for cloths change for trainees and according to 76.9% of them, the center provide enough rest periods to the trainees. Almost halve of the trainers said that the center has special places for the trainees to rest. Good quality drinking water is provided to the trainees according to 87.5% of the trainees but 58.7% of them said that there are enough bathrooms for the trainees. These hygiene conditions are required by the Palestinian act of OSH for the year 2000.

4.3.5 Understanding of Occupational Safety and Health Related Concepts:

Table 9: Percentage of Occupational Safety and Health related concepts

Items	Completely true	Partial True	false
	%	%	%
occupational safety and health	7.4	40.7	51.9
occupational disease	10.2	36.1	53.7
occupational hazard	0.9	16.7	82.4
safe work environment	14.8	44.4	40.7

Only 7.4% of the trainers completely knew the meaning of occupation safety and health while, 10% of them knew the concept of occupational disease. More than 82% of the trainers did not know the concept occupational hazard and less than one percent of them had complete true answer. About halve of the trainers knew what meant by safe work environment. This is inconsistent with the fact that about 70% of the trainers had received training on OSH as they mentioned in the first parameter of the questionnaire. This also could mean that their training is ineffective.

4.3.6 Accidents among Trainees:

Table 10: Percentage of accidents among trainees

Accident type	percentage
Cuts	38.67%
Burns	15.47%
Eye injuries	15.47%
Fracture	12.71%
Electric shock	9.39%
Suffocation	6.6%
Fall dawn	1.10%
Slipping	0.55%

This table shows the most frequent accidents among the trainees. Cuts has the highest percentage 38.6%, burns and eyes accidents come next with 15.4% then the fracture with 12.7%. These accidents are nonfatal but still considered dramatic events to the trainees. This result is consistent with the results of a review done on the accidents young workers experienced. The review results were that the accidents of the young workers were nonfatal but they are more susceptible to accidents than older workers (Salminen, 2004).

Checklist Results

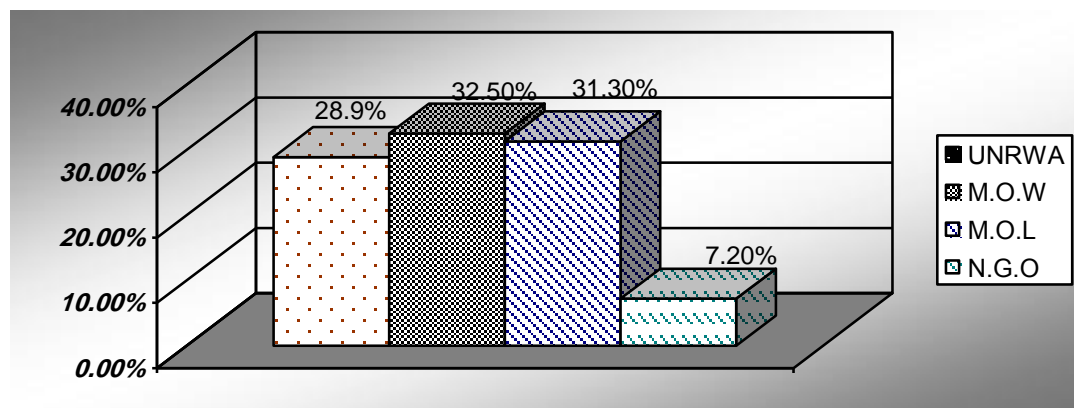
Description of the Sample:

Distribution of the Study Population by the Provider:

Table 11: Distribution of the study population by provider of the service.

Provider	Center	No.	%
UNRWA	GTC	22	26.5
	KYTC	2	2.4
	Subtotal:	24	28.9
M.O.W	Gaza social center	8	9.6
	Khanyounis social center	3	3.6
	Dier el balah social center	5	6.0
	Rafah social center	4	4.8
	Biet lahia social center	7	8.4
	Subtotal:	27	32.5%
M.O.L	Al Imam el shfie training center	10	12.0
	Khanyounis training center	6	7.2
	Dier el balah training center	5	6.0
	Rafah social center	5	6.0
	Subtotal:	26	31.3
L.N.G.O	Gaza training	4	4.8
	El Qararh	2	2.4
	Subtotal:	6	7.2
Grand Total:		83	100.0

The study results show that Ministry of welfare has the highest number of vocational training workshops with 32.5% of the total number of the workshops. This makes it the main provider of vocational training in Gaza strip. Ministry of labor comes next with 31.3%. UNRWA comes third with 28.9%. UNRWA Gaza training center has the highest number of workshops with 26.5% of total workshops. Local NGO has the lowest percentage of the vocational training workshops in Gaza strip 7.2%. Graph one show the distribution.



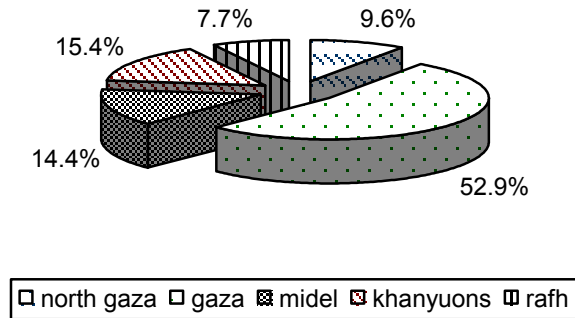
Graph 1: Distribution by provider

Distribution of the Study Population by the Governorate:

Table 12: Study distribution of population by governorate

Governorate	Frequency	Percent
North Gaza	7	8.4
Gaza	45	54.2
Middle	10	12.0
Khanyounis	13	15.7
Rafah	8	9.6
Total	83	100.0

The study results show that the highest percentage of the workshops is in Gaza governorate 54.2%. Khanyounis comes next with 15.7%. The lowest percentage is in North Gaza governorate 8.4%.



Graph 2 shows the distribution

Distribution of the Parameters among the Study Population

Fire Hazard

Table 13: Distribution of the first parameter " Fire hazard"

Items	NA	present		
		bad	accepted	good
Fire distinguishers in place and inspection	30.1	22.9	16.9	30.1
Clean signs of emergency doors	89.2	6.0	1.2	3.6
Emergency doors present	43.4	2.4	7.2	47.0
Emergency exits free of obstacles	43.4	3.6	14.5	38.9
Effective alarm system	72.3			27.7
Instructions in case of fire	80.7	1.2	6.0	12.0
Assembly areas well defined	80.7	1.2	4.8	13.3
Training on evacuation	96.2			4.8

According to the numbers in this table, more than 85% of the workshops have no precautions against fire hazards.

As mentioned in the literature review, fire hazards are conditions that favor fire development or growth. Three elements are required to start and sustain fire: oxygen, fuel, and heat. Fire or combustion is a chemical reaction between oxygen and a combustible fuel. All the workshops in the vocational training centers have all the three elements required to start and sustain fire. The OSH standards have highlighted the importance of the fire protection, employees training regarding fire safety, and presence of Emergency Action Plan (EAP) and Fire Prevention Plan (FPP). Businesses with more than ten employees must have written emergency action plan and written fire prevention plans. Businesses with less than ten employees, the elements of the plan can be communicated orally. An EAP details the actions employees are to take in the event of an emergency. An emergency may include bomb and violence threats, accidental releases of toxic vapors, chemical spills, fires, or explosions. The plan should address all potential emergencies that can be expected in the workplace. The primary objective of the EAP is to have all employees know how to: exit to safety, alert fellow employees, notify the appropriate emergency resource agency. The EAP must include, as a minimum, the following elements: Emergency escape procedures and procedures to be followed by employees who remain to perform critical plant operations. Also must include procedures to account for all employees after an emergency evacuation and rescue and medical duties for those employees who are to perform them. In addition to preferred means for reporting emergencies, and names or regular job titles of persons or departments to be contacted for further, information or explanation of duties under the plan. The Fire Prevention Plan (FPP) is a written plan intended to educate employees about specific hazards of their jobs. In essence, the FPP is an extension of the EAP. The FPP must include, as a minimum,

these elements: a list of the major workplace fire hazards and their proper handling and storage procedures, potential ignition sources and their control procedures, and the type of fire protection equipment or systems that protect against these hazards. In addition to names or regular job titles of personnel responsible for maintenance of equipment and systems installed to prevent or control ignitions or fires. Also must include names or regular job titles of personnel responsible for control of fuel source hazards and guidelines for proper housekeeping procedures. In addition to guidelines for training employees in the fire hazards of the materials and processes to which they are exposed plus procedures for preventive maintenance of equipment and systems installed on heat producing equipment (LCD, 1999)

Training: To minimize the risk to people in case of fire, it is essential that they all receive adequate fire safety training appropriate to their role. Fire safety training can be broadly divided into four types – induction, basic, refresher and training of key workers. Induction training should be given to all new staff before they start work and should include an explanation of evacuation procedures, method of raising the alarm and any rules concerning smoking. They should be made familiar with the escape routes from any place where they have to work to specified assembly points. This could be done by adequate signs and written information. Basic and refresher training should be given to all staff, preferably at least twice a year, but at least once a year. Training of key workers should apply to certain categories of staff. Every person identified in the emergency plan as a person responsible for supervising and controlling putting the emergency plan into effect and conducting fire drills should have access to the risk assessments and to the emergency plan. They should also be given additional instruction in matters that will be their particular responsibilities over the above basic training. Specific aspects of training will include the supervision of evacuation and roll-call procedures, the control of contractors

and the safety of visitors in the event of fire and liaison with the local authority fire brigade. These key personnel need to be clear how they fit into the overall emergency plan. Key personnel should receive refresher training at appropriate intervals. A practice fire drill should be carried out twice a year. It is a good exercise to simulate conditions in which one or more exits or escape routes from the building obstructed. During these drills a member of staff, who is told of a supposed outbreak of fire, should operate the fire alarm. The fire routine should then be followed as fully as circumstances permit. The practice fire drill should be part of management's consideration and scrutiny of the quality of training (HSE, 2005, ^a). In this case, the trainers are the key persons of the vocational centers and should receive all the training regarding fire hazards according to the recommendations of the OSH standards.

All the elements assessed in the fire hazards domain are part of the EAP and FPP. The results of the study showed that more than 50% of the workshops assessed in this study have no or poor fire distinguishers. In 89% of the workshops, have no clear signs for emergency doors and 6% of the workshops with signs, these signs are in bad condition. The emergency doors or exits are not present in 43.4% of the workshops and not free of obstacles in 43.4% of the workshops. There is no effective fire alarm system in 72% of the workshops. In 80.7% of the workshops there are no written emergency plan or defined assembly areas. In 96% of the workshops, no evacuation training has been done to the trainees or the employees.

The Electrical Hazard:

Table 14: Distribution of the second parameter " Electrical hazard"

Items	NA	present		
		bad	accepted	good
Condition of the wires	1.2	3.6	14.5	80.7
The switches and points		7.2	20.5	72.3
Mobile electrical devices in good condition	3.6	2.4	12.0	81.9
No wires on the floor	4.8	3.6	3.6	87.9
Emergency switch off	3.6		1.2	95.2

The Electrical Hazards: Electricity is often referred to as a “silent killer” because it cannot be tasted, seen, heard, or smelled. It is essentially invisible. Electricity has long been recognized as a serious workplace hazard, exposing employees to electrical shock; which can result in electrocution, serious burns, or falls that result in additional injuries or even death; as well as electrical arc-flash and electrical arc-blast. (Neitzel, 2005)

Reducing Electrical Hazards: the Palestinian act has many conditions ensure safety from electricity hazards as follow: first, general conditions: the electrical current must be shut off before any maintenance work or electrical work with precautions from turning the current accidentally during the work. When working with electrical equipment for maintenance the worker should wear special personal protective equipment from electricity. When working on high voltage source there should be two persons who have good knowledge of electrical safety and can perform cardio pulmonary resuscitation. Second, the dynamic electricity: all the electrical wires should be in the right thickness and from the appropriate material kind to tolerate the severity of the current passing into it, and

all of it should be isolated and protected from the sun, heat, or sharp objects. All the electrical wires should be secured in specific paths in safe method. The ground cables are covered and protected from water and sewage and should be painted. Every electrical circuit should have ground wire, and circuit breaking. The electricity control board should be outside especially outside the rooms with steams, gases, dusts, or any flammable materials, and should be in well closed cabinet with outside control handle. Third, the electrical equipment: these equipment should be in good safe condition. All of them should be grounded. Precaution signs should be nearby the equipment with high voltage current. All the persons maintaining the electrical equipment should be with high skill and good training, and no work done till electricity is off. Fourth, the control board: it should be in safe place, connected to the equipment or circuits in safe way, and easy to reach. All the wires attached to it are in good condition. Isolated surfaces should be around the control board. Fourth, the static electricity: the static electricity should be discharged in continuous bases especially from the places with gases, smokes, or flammable substances with one of the following methods: all the metal equipment which is around high voltage source should be grounded, humidity rates should be suitable, and using static electricity collectors. The workers wear shoes that discharge static electricity to the ground. (Pal, act, 2004)

OSHA's standards relating to electricity are divided into two categories: design of electrical systems and safety related work practices. These general precautions for electrical hazards: ensure that power has been disconnected from the system before working with it. Test the system for de-energization. Capacitors can store current after power has been shut off. Allow only fully authorized and trained people to work on electrical systems. Do not wear conductive material such as metal jewelry when working with electricity. Screw bulbs securely into their sockets. Ensure that bulbs are matched to the circuit by the correct voltage rating. Periodically inspect insulation. If working on a hot

circuit uses the buddy system and wears protective clothing, do not use fuse with a greater capacity than was prescribed for the circuit. Verify circuit voltage before performing work. Do not use water to put out an electrical fire. Check the entire length of electrical cord before using it. Use only explosion proof devices and nonsparking switches in flammable liquid storage areas. Discharge capacitors before working on the equipment. Enclose uninsulated conductors in protective areas. Use fuses and circuit breakers for protection against excessive current. Provide lighting protection on all structures. Train people working with electrical equipment on a routine basis in first aid and cardio pulmonary resuscitation (Chao and Hanshaw, 2002).

The study results regarding the electrical hazards showed that about 90% of the workshops have good and accepted conditions of the electrical net work. These results are consistent with the OSH local and international standards. This means that the workshops have control over the electrical hazards.

Illumination:

Table 15: Distribution of the third parameter " illumination "

Items	NA	present		
		bad	accepted	good
Lighting is suitable for the type of work		32.5	33.3	33.1
Nature lighting is good	1.2	32.5	20.5	32.5
Emergency lighting	33.7	9.6	6.0	7.2

Lighting: It defined as the quantity of light over specific area. The good lighting in the workplace has direct effect on the vision of the workers in both its weakness or over lighting. The quality of lighting on workplace is determined by several factors as follows:

the quantity, free from reflections, regular levels, continuity, and the right color (Helmi and El Afshouk, 2000).

OSH Standards of Lighting: The Palestinian act for physiological hazards regulations states the following regarding the lighting in workplace: the glass of windows should be clean all the time from inside and outside. This is to make use of natural lighting as much as possible. The light sources should be distributed all over the workplace so they give the same level of light all over the workplace. The light should be free from reflections. The color of the walls and ceiling is bright to give good lighting. Emergency lights are available in case of power off especially in the corridors and exits (pal. Act. 2004).

The Arab labor Organization's (ALO) Limitations for Light Are as Follow:

These limits should be appropriate for all workers from different age groups in the workplace and to the different types of activities. These general rules should be considered: The light must not reflected on the eyes directly either from the source or reflected from shiny surface. The eyes must not be exposed to sever light without protective equipment. The light in workplace should be indirect and meet the limits accepted according to the work activity. The light should be measured from above the work surface. The limits mentioned in the below table are the minimum levels which the light must not get below it in the workplace.

The threshold limits to the illumination in according to the work activities

	The activity		Minimum level/lux		Recommended lux
			from	to	
Activities need mild accuracy:	1- connection of large piece and construction		100	300	400
	2- works with machines or over the counter	○ activities need moderate accuracy	500	700	1000
		○ activities need high accuracy	700	1200	1500
		○ activities need extra accuracy	1500	2000	3000

Source: Arab labor organization 1999.

The activities in the workshops of this study come under the activities that need mild accuracy. These activities described in the previous table. These activities include connection of large pieces as in aluminum work, and construction works as in construction and décor work. Other activities, which include works with machines and need moderate to high accuracy as in the most of the workshops as welding, office tools maintenance, car repair and others.

In 32.5% of the workshops, the lighting level is not suitable to the type of work. Only in 33% of them, it is good and suitable for the work type. Nature lighting is used and effectively in about halve of the workshops. Emergency lighting is not present in 33.7% of the workshops and in bad conditions in 9.6% of them. These results are according to the recommended levels by the ALO.

The Chemical Hazards:

Table 16: Distribution of the forth parameter " Chemical hazard"

Items	NA	present		
		bad	accepted	good
Material safety data sheet	71.1	9.6	6.0	3.6
Special store for chemicals	83.1	3.6	3.6	3.6
Safe disposal of the chemical wastes	77.1	3.6	7.2	6.0

The Chemical Hazards: It is a type of occupational hazards includes mists, vapors, gases, dusts, and fumes. Chemical hazards are either inhaled, absorbed through the skin, or ingested (Goetsch, 2005).

OSH Standards Regarding the Chemical Hazards:

The Palestinian act for the chemical hazards control covers the following aspects related to the chemicals in workplace: the use and handling chemicals, storage of chemicals, and disposable of chemical waste. First, the use and handling of chemicals, MSDSs must be on all the chemical containers used by the workers and they should know it. The appropriate precautions should be done to prevent exposing workers to the hazard of mixture of chemicals with harmful effects. All the appropriate precautions to protect the workers from the hazards of chemical spills, hot chemicals, explosive substances, or any other harmful substances should be considered. All the residue of chemicals and the empty containers should be discarded appropriately. Empty containers should not be used as containers for food or drinks. First aid materials plus the eye and body washers should be available in the workplace. Appropriate precautions to prevent, remove, decrease the distribution, or decrease the concentration of the dangerous substances and harmful to health inside the

workplace by using the appropriate engineering methods. The accumulation of dusts should be prevented by using engineering methods. The occupational safety and health precautions should be taken in the transportation and handling the chemicals inside the work environment. Second, storage of the chemicals: MSDSs should be in all the chemical containers. Only the amount of chemicals needed for the work processes should be at work sites. All the chemicals should be stored in its original containers. The containers should be in good condition and arranged in good way with nothing on top of it or around it. The store area should be appropriately ventilated. The passages between the stored containers should be clear of any obstacles. The floor of the store smooth, easy to be cleaned, does not absorb liquids, and do not produce electrical sparkles. Explosive substances should not be stored near the oxidized substances, or store substances that react with each other near each other. The flammable substances have special storage conditions as follow. The flammable substances are to be stored in cold area with good ventilation away from flam resources. The store should be away from the work site, easy accessibility, good firefight system is available, the doors and cabinets of the store should be made of fire resistance material, and no smoking in the store or any source of open fire at least 6 meter away from the store. Third, disposal of chemical waste: the wastes should be removed from work site continuously and to be stored in special separated stores to be disposed later, the wastes should not be discarded in the sewage, and the wastes to be disposed according to the manufacture institution instructions. (Pal, act, 2004)

OSHA act for occupational safety and health has the following instructions regarding exposure to chemicals in workplace. If air borne impurities, such as dust, smoke, gas or vapor, occur in a workplace to a degree which is injurious or disturbing to the employees, their spreading shall, as far as possible, be prevented by isolating the source or by placing it in a closed space or equipment. The airborne impurities shall be collected and removed

to an adequate degree by means of appropriate ventilation. Employee's exposure to chemical agents that cause hazards or risks to safety and health shall be reduced to such level that no hazard or risk from these agents is caused to the employee's safety or health or reproductive health. Particularly, protective measures necessary for preventing poisoning, oxygen deficiency or other similar serious risks shall be ensured. Special caution shall be exercised when handling, storing or transferring explosive, flammable or corrosive substances or other substances involving similar hazards. The employees shall be given such information on dangerous substances that is necessary considering the working (OSH, act, 2002).

In the hazard communication guidelines for compliance of OSHA, the instructions for the employer regarding the chemicals in the workplace are the following. Should compile as complete a list as possible of the potentially hazardous chemicals in the workplace, MSDS of all these substances should be received by the employer, employees should not be allowed to use any chemicals with no MSDS, MSDSs must be readily accessible to employees when they are in their work areas during their work shifts. Each employee who may be "exposed" to hazardous chemicals when working, must be provided information and be trained prior to initial assignment to work with a hazardous chemical, and whenever the hazard changes. Information and training are a critical part of the hazard communication program. Workers obtain information regarding hazards and protective measures through written labels and material safety data sheets. It is through effective information and training, however, that workers will learn to read and understand such information, determine how to acquire and use it in their own workplace, and understand the risks of exposure to the chemical in their workplaces as well as the ways to protect themselves. The training shall include methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring

conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released). The physical and health hazards of chemicals in the work area. The measures employees can take to protect themselves from these hazards, including specific procedures, the employer has implemented to protect employees from exposure to hazardous chemicals. Such procedures as appropriate work practices, emergency procedures and personal protective equipment to be used; and the details of the hazard communication program developed by the employer, including an explanation of the labeling system and the MSDS, and how employees can obtain and use the appropriate hazard information. (OSHA, 2007)

Material safety data sheet MSDS is not present in 71% of the workshops. This is inconsistent with the OSH standards locally and internationally. The Palestinian act for OSH states that all the chemicals in workplace should have MSDS (pal. Act, 2000). The OSHA standards also emphasize that all the chemicals in workplace must have MSDS (OSHA, 2007). About 83% of the workshops do not have special store for the chemicals.

This is also inconsistent with the OSH standards regarding the chemicals in workplace. Chemical wastes are not safely disposed in 77% of the workshops. The Palestinian act for the year 2000 emphasizes on the importance of continuous disposal of the chemical wastes in the workplace. In addition to be separately stored until, be disposed.

First Aid:

Table 17: Distribution of the fifth parameter " First aid "

Items	NA	present		
		bad	accepted	good
First aid box and materials	34.9	15.7	20.5	28.9
Easy access to the first aid box	34.9	8.4	13.3	43.4
First aid box place is known to every one	34.9	6.0	7.2	86.7

First Aid in Workplace:

The Palestinian act number 17 for the year 2000 states that every employer has to provide first aid box or more with its materials in the workplace. The materials include medications and tools needed for first aid procedures. The first aid box should be away from any source of danger and reached easily. The materials which should be in the box are: gauze bandage, plaster roll, crepe bandage, cotton, sterile eye pads, triangular bandage, tourniquet, scissors, antiseptic solution, analgesic, burns ointment, first aid plaster, thermometer, and examination gloves (pal. Act, 2000)

First aid box with its materials is not available in 34.9% of the workshops. When it is available, in 53% of the workshops it is not easily reached. In about 35% of the workshops, not every one knows the place of the first box. All these results of the study are inconsistent with the Palestinian act regarding the first aid box in workplace.

The Floor:

Table 18: Distribution of the sixth parameter " The floor "

Items	NA	present		
		bad	accepted	good
Smooth without holes		6.0	7.2	86.7
Presence of oil or greases	1.2	4.8	10.8	83.1
Entrance and passage ways free of obstacles		19.3	33.7	47.0
Vision is clear at crossings			26.5	73.5

The condition of the floor is good or accepted in about 90% of the workshops. Clearance of vision at the crossing points is good and accepted in all the workshops. These results are consistent with the instructions of the Palestinian act regarding the OSH conditions of the workplace building as the following: The floor: to be made of strong material and has the ability to tolerate heavy machines and equipment. To be cleaned easily. Isolated from humidity and do not absorber liquids. To be straight free of holes or other obstacles, this can cause accidents, like falling, and should prevent slipping. The passages: the passages should be in adequate number with enough width to allow the passage of the workers and equipment and to have signs showing the emergency exits. The passages between the workplace should be straight smooth to prevent slipping and falling. In cases of sudden turns, mirrors should be placed at points of turns (Pal, act, 2004).

Machines and Equipment:

Table 19: Distribution of the seventh parameter " Machines and equipment "

Items	NA	present		
		bad	accepted	good
Clean	1.2	1.2	12.0	84.5
Safeguards present	19.3	4.8	36.3	38.6
Off Switches easily reached	2.4	1.2	2.4	94.0
Regular maintenance	2.4	6.0	34.9	45.8
Spaces around it good for work performance	1.2	18.1	34.9	45.8
Its noise is controlled	8.4	19.3	45.8	26.5
Lighting on it	2.4	2.4	26.5	68.7

The results show that in 96.5% of the workshops the machines and equipment are clean. About in 24% of the workshops, the machines and equipment do not have safeguards or the safeguards are in bad condition. Off switches of the machines are easily reached in 96.4% of the workshops. Regular maintenance of the machines and equipment is done in 80.7% of the workshops. There are good spaces around the machines for work performance in 80.7% of the workshops. These results show that 19.3% of the workshops do not do regular maintenance to machines and equipment and in 19.3% of the workshops, the machines and equipment do not have good spaces around it for work performance. The noise of the machines is well controlled in 72.3% of the workshops. However, it is not controlled in 27.7% of the workshops. There is a good lighting on the machines in 95.2% of the workshops. The elements studied in this domain are request of the OSH standards regarding safety of machines and equipment. The study results show that the conditions

regarding machines and equipment in the workshops of the study are consistent with the OSH regulations regarding safety of machines in workplace.

Only one big concern, 19.3% of the workshops do not use or do not have safeguards on its machines and do not have enough spaces around it for work performance. These conditions are accidents causing according to the theories of accident causing (Friend and Kohn, 2007).

Waste Disposal:

Table 20: Shows distribution of the eighth parameter " Waste disposal "

Items	NA	present		
		bad	acce	good
Waste baskets available and has sacs	8.4	14.5	30.1	47.0
Waste baskets emptied regularly	8.4	1.2	9.6	80.7
Socked cloths kept in closed containers	59.0	3.6	12.0	25.3

Regarding the cleanness in the workshops, the condition is accepted. More than 60% of the workshops are badly dispose the socked cloths.

Indoor Environment:**Table 21: Distribution of the ninth parameter " Indoor environment "**

Items	NA	present		
		bad	acce	good
Natural ventilation		8.4	15.4	75.9
Ventilation system	62.7	3.6	6.0	27.7
Temperature is comfortable	3.6	7.2	48.2	34.9
No smoking sign	91.6	2.4		3.6
Level of noise	2.4	31.3	41.0	19.3
Guidance and warning signs	69.9	3.6	18.1	8.4

Natural ventilation is good and accepted in more than 90% of the workshops. Effective ventilation system is not available in 62.7% of the workshops. Temperature is good and accepted in about 80% of the workshops. 91.6% of the workshops do not have, no smoking, sign. Noise levels are good and accepted in 60% of the workshops but bad in 31.3% of them. Warning and guidance signs are not available in 69.9% of the workshops.

Personal Protective Equipment:**Table 22: Distribution of the tenth parameter " Personal protective equipment "**

Items	NA	present		
		bad	acce.	good
Availability of PPE	31.3	2.4	19.3	47.0
PPE usage by the trainees	30.1	4.8	33.7	31.3
Trainees training on PPE usage	34.9	8.4	16.9	39.8
PPE maintained regularly	32.5	7.2	13.3	47.0
PPE suitable to the type of work	32.5		13.3	54.2

The PPE is available in more than 50% of the workshops and in good and accepted level. More than 50% of the workshops do not provide training on PPE usage to the trainees. Trainees do not use PPE in 30% of the workshops. In 32.5% of the workshops the PPE are not suitable to the type of work.

The Store:

Table 23: Distribution of the eleventh parameter " The stores "

Items	NA	present		
		bad	Acce.	good
MSDS on the stored chemicals	68.7	4.8	9.6	16.9
Place of the store is clear	14.5	2.4	7.2	75.9
Good ventilation of the store	12.0	19.3	36.1	32.5
Safe arrangement of stored materials	13.3	21.7	32.5	33.5
Isolation of the hazardous materials	44.6	13.3	12.0	25.3

The stored chemicals have no MSDS in 68.7% of the workshops. The store's place is clear and known in about 83% of the workshops. The ventilation in the stores is not available or bad in about 30% of the workshops. In 35% of the stores, the materials are not arranged in safe way that prevents accident. The hazardous materials are not isolated in 53.9% of the stores in the workshops.

Hand Tools:**Table 24: Distribution of the twelfth parameter " Hand tools "**

Items	NA	present		
		bad	Acce.	good
In good condition		6.0	21.7	72.3
Suitable to the work type			16.9	83.1
With high quality		3.6	26.9	69.9
Used for its purpose	1.2	-	13.3	85.5
Trainees training on it	1.2		7.2	91.6
Special store	7.2	2.4	13.3	77.1

In 94% of the workshops, the hand tools are in good and acceptable conditions. The hand tools are suitable to the type of work in all the workshops. In 96% of the workshops, the hand tools are with high quality. The trainees trained on the usage of hand tools in 98.8% of the workshops. There are special stores for hand tools in 90% of the workshops.

Emergency Plans:**Table 25: Distribution of the thirteenth parameter " Emergency plans"**

Items	NA	present		
		bad	Acce.	good
Availability of the emergency plans	84.3	2.4	2.4	10.8
Present in clear place	94.0	2.4		3.6
Evacuation plan present and training done	89.2	3.6	1.2	6.0
Emergency tools available	88.0	1.2	1.2	9.6
Alarm is present	71.1	2.4		6.5

The emergency plans are not available in 84.3% of the workshops. In 89% of the workshops, there is no evacuation plan. Emergency tools are not available in 88% of the workshops. There is no alarm in 71% of the workshops.

Workplace:

Table 26: Distribution of the fourteenth parameter " workplace "

Items	NA	present		
		bad	Acce.	good
The height is suitable	2.4	1.2	14.5	81.9
Workplace arranged in way prevents whickered positions	2.4	16.9	45.8	36.1
Heavy frequent used tools stored in suitable height	1.2		25.3	73.5
Trainees protected from sharp flying objects	6.0	1.2	34.9	57.8

The workplace here means the workshop where training takes place. According to the study results, the workplace conditions are in good and accepted levels.

Hazardous Materials:

Table 27: Distribution of the fifteenth parameter " Hazardous materials "

Items	NA	present		
		bad	Acce.	good
Hazardous materials known to the trainees	22.9	16.9	27.7	32.5
Trainees know its effects	21.7	19.3	21.7	37.3
Level of exposure	22.9	6.0	24.1	47.0
Emergency plan present	91.6			8.4

The trainees in about 40% of the workshops are not familiar with the hazardous materials in their workshops. Also in about 40% of the workshops, the trainees do not know the effects of the hazardous materials. There is a bad exposure to the hazardous materials in about 30% of the workshops. There are no emergency plans in cases of hazardous materials emergencies in 91.6% of the workshops.

4.2 Inferential Statistics

4.2.1 Self-administered questionnaire to the vocational trainers:

Table 28: Shows the differences between centers by the occupational safety and health standards by the view of the trainers

Dependent variables (OSH standards)	Independent variables (OSH status)	N	Mean	SD	F	P value
Domains extracted from the questionnaire						
Training	UNRWA	37	1.70	.337	4.24	.007
	Ministry of labor	28	1.52	.404		
	Ministry of social welfare	31	1.69	.330		
	NGOs	8	2.00	.000		
Institutional Characteristics	UNRWA	37	1.78	.241	22.46	.000
	Ministry of labor	28	1.45	.215		
	Ministry of social welfare	31	1.57	.179		
	NGOs	8	2.03	.198		
Training environment	UNRWA	37	1.96	.078	8.16	.000
	Ministry of labor	28	1.84	.179		
	Ministry of social welfare	31	1.85	.140		
	NGOs	8	2.00	.000		
Safety training of the trainees	UNRWA	37	2.06	.230	3.41	.020
	Ministry of labor	28	2.05	.238		
	Ministry of social welfare	31	1.99	.339		
	NGOs	8	2.32	.066		
Hygiene Conditions	UNRWA	37	2.03	.570	6.70	.000
	Ministry of labor	28	2.05	.515		
	Ministry of social welfare	31	2.22	.513		
	NGOs	8	2.90	.185		
Overall	UNRWA	37	1.91	.196	13.25	.000
	Ministry of labor	28	1.78	.187		
	Ministry of social welfare	31	1.86	.190		
	NGOs	8	2.24	.055		

ANOVA test used to compare the means of the five parameters of OSH standards in vocational training center type (Domains from the questionnaire) (Table x). The results showed that there were statistically significant differences between the vocational training center and OSH training requirements (p -value = 0.007), with higher mean score (2.0) for NGOs centers then the UNRWA centers (1.70) and ministry of social welfare (1.69) and ministry of labor (1.52) according to post hoc test (Scheffee test).

The results showed that the NGOs centers have good commitment to the OSH training to its trainers. UNRWA centers come next in this commitment. The MOW and MOL need more commitment to improve the requirements of their centers regarding the OSH training. In addition, need to improve their current performance as NGOs and UNRWA centers to achieve best OSH training to the trainers according to the guideline of trainer's training. "The trainer must trained well regarding OSH issues because he is the responsible to train the trainees on OSH related issues" (Jubran, 2006). In addition, in order for the trainer to fulfill his role as trainers, he should be able to train his trainees on OSH – related issues (Jaber, 2001, ^b)

Also the result showed that there were statistically significant differences between center type and the institutional characteristics regarding OSH (p -value =.000), with higher mean scores (2.03) for NGO centers than the UNRWA centers (1.78) , the MOW centers (1.57), and the MOL centers(1.45). Therefore, the policies in the NGO centers and the administration concerns regarding OSH in the centers are the best. The UNRWA centers come next. Again MOW and MOL centers come third and fourth. Therefore, the administrations in these centers need to pay more attention to the OSH in their centers and carry on all the needed policies regarding OSH. The administrations in theses centers are as the employer in the workplace. According to the OSH regulations and standards, locally or international, the employer has the responsibility to carry on every necessary step to eliminate and control the workplace hazards and adopt all the related OSH policies. Regarding the training environment" machine and equipment safety" the result showed that there were statistically significant differences between the centers type and the training environment (p -value = 0.000), with higher mean scores (2.00) for NGOs centers than the UNRWA centers (1.96), the MOW centers (1.85), and the MOL centers (1.84). This means that NGOs centers had better safety conditions regarding the machine and equipment

safety than the other centers, which need more attention to improve centers conditions regarding machine and equipment safety to meet the international standards to ensure high safety level for the trainers and trainees.

The results also showed that there were statistically significant differences between the center type and the safety training of the trainees (p -value = 0.020), with higher mean scores (2.32) for NGOs centers than the UNRWA centers (2.06), the MOL centers (2.05) and the MOW (1.99). From the results, it could be concluded that, MOW centers need to improve their safety training for the trainees. This training includes training on OSH, first aid skills, and training on fire distinguisher use plus the availability of first aid box and materials.

The results show that there were statistically significant variations in reference to center type and the hygiene conditions of the center (p -value = .000), with higher mean score (2.90) for NGOs centers than the MOW centers (2.22), the MOL centers (2.05) and the UNRWA centers (2.03). This means that the best conditions are in NGOs centers. Other centers could benchmark and learn from the experience of the NGOs.

Table 29: Differences between the governorates by the occupational safety and health standards by the view of the trainers

Independent variables (OSH status)	Dependent variables (OSH standards)	N	Mean	Std. Deviation	F	P value
Domains extracted from the questionnaire						
Training	North Gaza	10	7.4000	.84327	1.684	.160
	Gaza	55	6.6727	1.47892		
	Middle	15	6.0667	1.62422		
	Khanyuonis	16	7.0625	1.18145		
	Rafah	8	6.3750	1.76777		
Institutional Characteristics	North Gaza	10	7.4000	3.33999	6.157	.000
	Gaza	55	8.9273	2.21823		
	Middle	15	5.1333	3.92550		
	Khanyuonis	15	8.4667	3.09069		
	Rafah	8	8.8750	.83452		
Training environment	North Gaza	10	8.0000	.81650	3.018	.021
	Gaza	55	8.1818	1.05569		
	Middle	15	7.4000	1.12122		
	Khanyuonis	16	7.3750	1.31022		
	Rafah	8	7.5000	.75593		
Safety training of the trainees	North Gaza	10	15.9000	2.55821	.354	.841
	Gaza	55	16.4909	2.41042		
	Middle	15	17.3333	8.20859		
	Khanyuonis	16	16.5000	2.42212		
	Rafah	8	17.5000	.75593		
Hygiene Conditions	North Gaza	10	9.8000	1.39841	.863	.489
	Gaza	55	9.8727	1.52819		
	Middle	15	10.5333	.99043		
	Khanyuonis	16	9.8750	.80623		
	Rafah	8	10.2500	1.38873		
Overall	North Gaza	10	8.1000	1.10050	2.648	.038
	Gaza	54	7.5556	1.51305		
	Middle	15	8.0000	1.36277		
	Khanyuonis	16	8.6875	1.13835		
	Rafah	8	7.0000	2.07020		
Total	North Gaza	10	56.6000	8.03050	.487	.745
	Gaza	55	57.5636	6.95159		
	Middle	15	54.4667	11.16670		
	Khanyuonis	16	57.4375	8.09089		
	Rafah	8	57.5000	5.31843		

ANOVA test was used to compare the means of the five parameters of OSH standards in the governorates (Domains from the questionnaire) (Table x). The results showed that there were statistically significant differences only in the following domains: the institutional characteristics and the training environment. In the institutional characteristics domain (p -value = .000), the results show that there are difference in this domain and the different governorates in Gaza strip. The highest mean was for Gaza governorate (8.92). Rafah governorate comes next (8.87). The lowest mean goes for the Middle governorate, which has two government vocational centers. One belongs to the MOL and the other one belongs to the MOW.

The other domain is the training environment in the training centers (p -value = .021). The results show that there are differences between the governorates regarding the training environment in the centers. The highest mean goes also for Gaza governorate (8.18). North Gaza comes next (8.00). The lowest mean goes for Khanyounis (7.37).

4.2.2 The Checklist:

Table 30: Differences between the governorates regarding the occupational safety and health Standards:

		N	Mean	Std. Deviation	F	P-Value
Fire hazards	North Gaza	7	.0536	.14174	3.779	.007
	Gaza	44	1.0540	.88377		
	Middle	10	.8750	.33850		
	Khanyuonis	13	.5865	.39325		
	Rafah	9	.7083	.40505		
Electrical hazards	North Gaza	7	2.5286	.53763		
	Gaza	44	2.7625	.37169		
	Middle	10	2.8400	.29515		
	Khanyuonis	13	2.6308	.61561		
	Rafah	9	2.9111	.10541		
Illumination	North Gaza	7	1.7857	.80917	1.081	.372
	Gaza	39	1.5962	.78559		
	Middle	10	1.9500	.38730		
	Khanyuonis	13	1.8654	.79461		
	Rafah	9	2.0278	.31732		
Chemical hazards	North Gaza	7	.0000	.00000	.834	.508
	Gaza	41	1.1463	3.45129		
	Middle	10	.0333	.10541		
	Khanyuonis	12	.3333	.88763		
	Rafah	9	.0000	.00000		
First aid	North Gaza	7	.2500	.43301	3.375	.013
	Gaza	44	1.3011	.89990		
	Middle	10	1.5833	.87929		
	Khanyuonis	13	1.5577	.95281		
	Rafah	9	.8611	1.03916		
Floor	North Gaza	7	2.6786	.40089	2.642	.040
	Gaza	44	2.5871	.46449		
	Middle	10	2.5750	.33437		
	Khanyuonis	13	2.9615	.13868		
	Rafah	9	2.5278	.26352		
Machines	North Gaza	7	2.2245	.47278	.987	.420
	Gaza	44	2.4589	.38386		
	Middle	10	2.3143	.23133		
	Khanyuonis	13	2.5000	.77865		
	Rafah	9	2.2381	.24744		
Wastes	North Gaza	7	1.5238	.69007	6.779	.000
	Gaza	44	2.1591	.62872		
	Middle	10	1.5667	.83222		
	Khanyuonis	13	2.3077	.56865		
	Rafah	9	1.1111	.89753		
Training environment	North Gaza	7	1.5556	.41201	.493	.741
	Gaza	44	1.4555	.47834		
	Middle	10	1.4667	.49979		
	Khanyuonis	13	1.6303	.57525		
	Rafah	9	1.3642	.49854		

PPE	North Gaza	7	1.0857	1.13053	3.983	.005
	Gaza	43	2.0884	1.05947		
	Middle	10	1.2800	1.37986		
	Khanyuonis	13	2.0000	1.41421		
	Rafah	9	.6667	1.01980		
Store	North Gaza	7	1.7714	.58228	5.340	.001
	Gaza	43	1.7407	.66407		
	model	10	.7600	.84748		
	Khanyuonis	13	1.9538	.97691		
	Rafah	9	1.1333	.67823		
Hand tools	North Gaza	7	2.7619	.23288	4.531	.002
	Gaza	44	2.7311	.27892		
	Middle	10	2.6167	.19325		
	Khanyuonis	13	3.0000	.00000		
	Rafah	9	2.5926	.40062		
Emergency plan	North Gaza	7	.0000	.00000	3.800	.007
	Gaza	43	.6140	.85345		
	Middle	10	.0000	.00000		
	Khanyuonis	13	.1846	.45798		
	Rafah	9	.0000	.00000		
Workplace	North Gaza	7	2.3690	.42725	.680	.608
	Gaza	44	2.5701	.35353		
	Middle	10	2.3750	.29463		
	Khanyuonis	13	2.4615	.80910		
	Rafah	9	2.5833	.33072		
Hazardous substances	North Gaza	7	.4000	.72111	9.589	.000
	Gaza	44	1.4045	.65484		
	Middle	10	1.3200	.40222		
	Khanyuonis	13	.3692	.70638		
	Rafah	9	1.1778	.41767		
Total	North Gaza	7	1.3992	.09173	4.995	.001
	Gaza	44	1.8560	.42448		
	Middle	10	1.5704	.23158		
	Khanyuonis	13	1.7631	.26551		
	Rafah	9	1.4602	.15375		

ANOVA test used to compare the means of the parameters of OSH standards in the workshops of the vocational training centers by the governorate (Domains from the checklist) (Table 1). The results showed that there were statistically significant differences between the governorate and OSH fire hazards requirements (p -value = 0.007), with highest mean score (0.883) for Gaza governorate. Next with big difference come Rafah governorate (0.405) and khanyounis governorate (0.393) and the Middle governorate (0.338). the lowest mean score goes for North Gaza (0.141) according to post hoc test (Scheffee test). The results showed that the centers located in Gaza governorate have good

commitment to the OSH fire hazards requirements in their workshops. The centers of Rafah governorate come next in this commitment. The centers in the other governorates need more commitment to improve the requirements of their centers regarding the OSH fire hazards. In addition, need to improve their status to achieve best OSH fire hazards requirements to their workshops according to the OSHA standards as explained in the literature review.

In addition, the result showed that there were statistically significant differences between governorate and the first aid OSH requirements (p -value = .013), with highest mean score (1.03) for Rafah then the khanyounis (0.953), Gaza governorate (0.899), Middle governorate (0.879). The lowest mean score goes also for North Gaza governorate (0.433). Therefore, the first aid OSH requirements are available most in Rafah governorate. The conditions are close khanyounis, Gaza, and Middle governorates but it worse in North Gaza governorate. This is the second worse place for North Gaza governorate beside the fire hazards. The center in this governorate is MOW center. There were also statistically significant differences between the floor domain and the governorate (p -value = 0.040). the highest mean score goes for Gaza governorate (0.464). Next come North Gaza governorate (0.40). Then comes Middle governorate (0.334) and Rafah governorate (0.263). The lowest mean score goes for khanyounis governorate (0.138). Regarding the floor's OSH, requirements in workplace the centers need to improve the floor conditions as the Palestinian act states. The real conditions are present because most of the centers are old and some of it not designed as vocational training center. Regarding the waste management in the workshops, the result showed that there were statistically significant differences between the governorates (p -value = 0.000), with highest mean scores (0.897) for Rafah governorate then the Middle governorate (0.832), North Gaza (0.690), then Gaza (0.628).

The lowest mean score goes for khanyounis (0.568). This means that Rafah governorate had better waste management and this is the third domain Rafah comes first.

The results also showed that there were statistically significant differences between the governorate and the personal protective equipment OSH requirements (p -value = 0.005), with higher mean scores (1.41) for khanyounis than the Middle (1.37), North Gaza (1.13), Gaza (1.05). The lowest mean score goes for Rafah (1.01).

The results show that there were statistically significant variations in reference to the governorate and the store conditions in the workshops (p -value = .001), with higher mean score (0.97) for khanyounis governorate than the Middle governorate (0.84), Rafah governorate (0.67), Gaza governorate (0.66). The lowest mean score goes for North Gaza governorate (0.58). This means that the best conditions are in khanyounis governorate. Other governorate could benchmark and learn from the experience of the khanyounis governorate. The results show that there were statistically significant variations in reference to the governorate and the hand tools conditions in the workshops (p -value = .002), with higher mean score (0.40) for Rafah, than Gaza (0.27), North Gaza (0.23), and the Middle (0.19). The lowest mean score goes for khanyounis (0.00). The results also showed that there were statistically significant variations in reference to the governorate and the presence of emergency plan in the workshops (p -value = .007). The highest mean score goes for Gaza (0.85), then khanyounis (0.45). With (0.00) mean score comes the rest of the governorates. From this, we can conclude that the majority of the centers need and must have emergency plan as OSHA recommendations. The results also show that there were statistically significant variations in reference to the governorate and the hazardous substances (p -value = .000). The highest mean score goes for North Gaza (0.72) then khanyounis (0.70). Next comes Gaza (0.65), then Rafah (0.41), last comes the Middle governorate (0.40).

Table 31: Differences between the providers regarding the occupational safety and health Standards in the workshops:

		N	Mean	Std. Deviation	F	P-Value
Fire hazards	UNRWA	24	1.4844	.32479	51.302	.000
	Ministry of labor	26	.4519	.43600		
	Ministry of social welfare	27	.3519	.43028		
	NGOs	6	2.1042	.81936		
The electrical hazards	UNRWA	24	2.8729	.17630	1.284	.286
	Ministry of labor	26	2.6615	.48914		
	Ministry of social welfare	27	2.7444	.39256		
	NGOs	6	2.6333	.72019		
Illumination	UNRWA	23	1.7717	.77940	.980	.407
	Ministry of labor	26	1.6923	.67568		
	Ministry of social welfare	27	1.8519	.70799		
	NGOs	2	1.0000	.00000		
The chemical hazards	UNRWA	21	.9683	.95397	.854	.469
	Ministry of labor	25	1.0800	4.40252		
	Ministry of social welfare	27	.0494	.20051		
	NGOs	6	.4444	1.08866		
First aid	UNRWA	24	1.8438	.48237	12.485	.000
	Ministry of labor	26	1.3878	.86344		
	Ministry of social welfare	27	.5185	.86582		
	NGOs	6	1.4167	1.11430		
The floor	UNRWA	24	2.6354	.45432	1.163	.329
	Ministry of labor	26	2.6635	.41196		
	Ministry of social welfare	27	2.5772	.39286		
	NGOs	6	2.9167	.12910		
Machines and equipment	UNRWA	24	2.6567	.33992	7.055	.000
	Ministry of labor	26	2.2060	.55671		
	Ministry of social welfare	27	2.2963	.31679		
	NGOs	6	2.7381	.18988		
Waste management	UNRWA	24	2.2222	.67148	4.302	.007
	Ministry of labor	26	2.0385	.77360		
	Ministry of social welfare	27	1.5432	.75757		
	NGOs	6	2.2222	.62063		
Training environment	UNRWA	24	1.6256	.51464	2.639	.055
	Ministry of labor	26	1.3269	.43186		

	Ministry of social welfare	27	1.4357	.41630		
	NGOs	6	1.7989	.70800		
PPE	UNRWA	23	2.6261	.32082	14.885	.000
	Ministry of labor	26	.9615	1.27124		
	Ministry of social welfare	27	1.4370	1.19876		
	NGOs	6	3.0000	.00000		
The store	UNRWA	24	1.8875	.69113	2.479	.067
	Ministry of labor	26	1.5077	.82797		
	Ministry of social welfare	27	1.3389	.77761		
	NGOs	5	1.9600	1.15239		
	Total	82	1.5909	.81533		
Hand tools	UNRWA	24	2.7778	.25380	3.954	.011
	Ministry of labor	26	2.6218	.32509		
	Ministry of social welfare	27	2.7840	.24379		
	NGOs	6	3.0000	.00000		
Emergency plan	UNRWA	23	.6522	.56958	42.388	.000
	Ministry of labor	26	.0615	.22464		
	Ministry of social welfare	27	.0000	.00000		
	NGOs	6	2.0333	1.15528		
Workplace	UNRWA	24	2.5556	.32662	.185	.906
	Ministry of labor	26	2.4712	.33412		
	Ministry of social welfare	27	2.5309	.38616		
	NGOs	6	2.4583	1.20848		
Hazardous substances	UNRWA	24	1.2083	.77903	1.598	.196
	Ministry of labor	26	1.1385	.62423		
	Ministry of social welfare	27	.9259	.66135		
	NGOs	6	1.6000	1.23935		
Total	UNRWA	24	1.9954	.23862	17.146	.000
	Ministry of labor	26	1.6196	.40224		
	Ministry of social welfare	27	1.4923	.20783		
	NGOs	6	2.1550	.34928		

ANOVA test used to compare the means of the parameters of OSH standards in the workshops of the vocational training centers by the provider (Domains from the checklist) (Table 2). The results showed that there were statistically significant differences between the providers in the fire hazards domain (p -value = .000). The highest mean score goes for the NGO (0.81), then comes MOL (0.436), MOW (0.430). UNRWA comes last with mean score (0.32). Regarding the first aid domain the results showed that there were statistically significant differences between the providers (p -value = .000). The highest mean score goes for the NGO (1.11), next comes MOW and MOL (0.86). Again UNRWA has the lowest mean score (0.48). There were also statistically significant differences between the provider and the domain of machines and equipment (p -value = .000). The highest mean score for MOL (0.55), next UNRWA (0.33), and then comes MOW (0.31). Last come NGO (0.18). The study results showed also that there were statistically significant differences between the provider and waste management domain (p -value = .007). The highest mean score for MOL (0.77), next MOW (0.75), and then UNRWA (0.67). The lowest mean score for NGO (0.62). There were also statistically significant differences between the providers regarding the training environment domain (p -value = .055). The highest mean score for NGO (0.70), next for UNRWA (0.51), then MOL (0.43), and last MOW (0.41). Regarding the personal protective equipment domain the results showed statistically significant differences between the providers (p -value = .000). The highest mean score for MOL (1.27), next MOL (1.19), then UNRWA (0.32) and the lowest score (0.00) for NGO. There were also statistically significant differences between the providers in regarding to the store conditions domain (p -value = .067). The highest mean score was for NGO (1.15), next was MOL (0.82), and then was MOW (0.77). The lowest mean score was for UNRWA (0.69). The study results showed also statistically significant differences between the providers and the hand tools domain (p -value = .011). The highest mean score

goes for MOL (0.32), next come UNRWA (0.25), and then MOW (0.24). The lowest mean score for NGO (0.00). There were also statistically significant differences between the providers regarding the emergency plan domain (p -value = 0.00). The highest mean score for NGO (1.15), next come UNRWA (0.56), and then MOL (0.22). the lowest mean score goes for MOW (0.00).

Chapter 5

Conclusions and Recommendations

5.1 Conclusions

Vocational training centers in Gaza strip are a very important resource of workers in the local market. The graduates of these centers are considered very large part of the working force. These graduates should be familiar with the occupational safety and health (OSH) in their training environment, so they can reflect this on the local market and to the safety and health of the working force. The providers of the vocational training in Gaza strip are very important providers such as UNRWA, MOL, MOW, and the NGO. Most of the centers provide vocational training for decays. The vocational trainers are well qualified, about 54% of them have experience years more than 10 years. Yet more than 30% of the trainers did not receive training on occupational safety and health issues. The study results showed that about 70% of the trainers had received training on OSH issues but more than 80% of them did not know the concepts of OSH asked in the study.

According to more than 80% of the trainers, the centers provide appropriate personal protective equipment (PPE), train the trainees on the use of PPE, and follow them up while using it. However, according to the results of the checklist used in this study, in about 50% of the workshops there were no PPE neither provided to the trainees nor training on the use of PPE. In addition to the fact that in more than 30% of the workshops the PPE are not suitable to the type of training.

Medical check up prior to the training is provided to the trainees according to 71% of the trainers and follow up medical check up is provided only according to 25% of the trainers. The administrations according to the trainers show concern towards safety at work and that the training environments are safe but only 26% of the trainers said that their centers have

special OSH technician. In addition, 76% of the trainers think that their workshops need changes regarding occupational safety and health. Curriculum of occupational safety and health is available in the centers according to the statement of 87% of the trainers.

Emergency plans are not available in 84% of the workshops. Alarm system is not available in 71% of the workshops. Neither evacuation plan is available or training on evacuation done in 89% of the workshops.

The hygiene conditions such as special place for cloths change, rest periods, rest places, good quality drinking water, and bathrooms for trainees are satisfactory.

The machines and equipment in the workshops according to the trainers are in very good condition and maintained regularly. Moreover, regarding the OSH standards, the machines and equipment are in acceptable conditions but still about 20% of them are in bad conditions. This makes them sources of hazards to the trainers and trainees.

Regarding the occupational hazards in the workshops, 85% of the workshops do not have any precautions against fire hazards. More than 90% of the workshops have good and accepted electrical hazards precautions. The physiological hazards were as following, the illumination was poor in about third of the workshops. Natural ventilation is accepted but more than 60% of the workshops have no ventilation system. Heat levels were comfortable in more than 80% of the workshops. Noise levels were unacceptable in more than 70% of the workshops. The conditions regarding the chemical hazards in the workshops are very poor. The chemicals used in the workshops do not have MSDS or special store. The chemical wastes are not disposed properly. About halve of the trainees are not familiar with the hazardous materials they are using or know the dangerous side effects of it. The stores in the workshops are in poor condition as the chemicals stored have no MSDS and not isolated from the other stored materials. The stored materials are not arranged in safe

way in about 50% of the stores. The ventilation is poor in more than 30% of the stores. The hand tools used by the trainees are in good condition and suitable for the type of work. The trainees are trained on the use of the hand tools in more than 90% of the workshops. The height of the workshops is suitable in more than 95% of them. The workplace is arranged in a way that prevents whickered positions in about 80% of the workshops. In about 80% of the workshops, there are special baskets with sac for wastes and disposed in regular bases. However, more than 60% of the workshops do not have special closed containers for the socked cloths, which are source of hazard to the trainees and their trainers as they are socked with flammable materials. In about 40% of the workshops, there are no first aid boxes or if found they do not have all the materials of the first aid or their place are not known to everyone. The conditions of the floor are good more than 90% of the workshops as they are smooth without holes and free of oil or greases. However, in about 20% of the workshops the entrances and passages are not free of obstacles, which can be source of injuries and accidents. The study results showed that the most common injuries among the trainees were the cuts (38%), burns and eye injuries (15%), fractures (12%) and electric shock (9%).

5.2 Recommendations

From the self-administered questionnaire and the view of the trainers in the vocational training centers, the subjects of this study, and the checklist we can conclude the following:

- 1- The vocational trainers need more effective training program on OSH.
- 2- The vocational centers need to adopt and develop OSH training programs to the trainees and to be part of the training curriculum.
- 3- All the vocational centers need more compliance to the OSH standards in the workshops especially the domains examined in this study.
- 4- Emergency plans have to be developed in the centers and to be known the trainers and trainees.
- 5- Future studies on the OSH training programs delivered to the vocational trainers and trainees.

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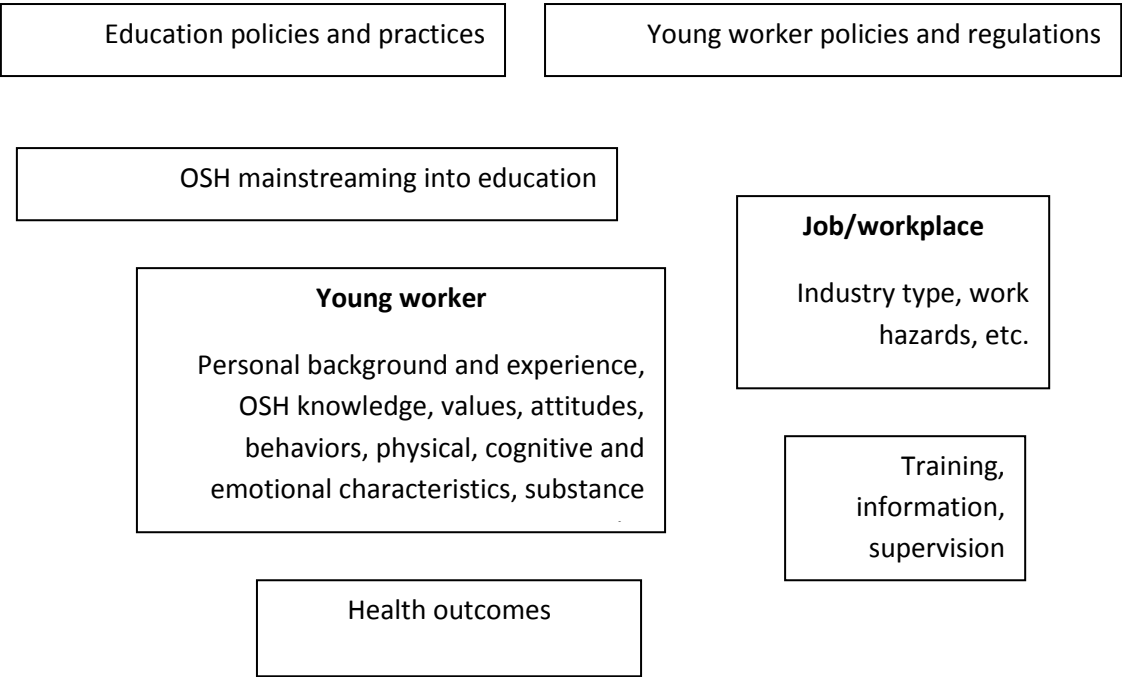
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Annexes

Annex 1

Model of (OSH) two-way strategy.



(EASHW, 2009).

Annex 2

The Arab labor organization's guideline for occupational exposure limits and standards regarding heat stress in workplace.

Work / rest	Effective Temperature/ type of work		
	Mild work	Moderate work	Hard work
Continues work-no rest	30.0c	26.7c	25.0c
75% work- 25% rest	30.6c	28.0c	25.9c
50% work- 50% rest	31.4c	29.4c	27.9c
25% work- 75% rest	32.2c	31.1c	30.0c

Source: Arab labor organization 1999.

Annex 3

The recommended temperature according to the work type by occupational safety and health institution in Amman Jordan.

Work type	Temperature c
Cognitive work in setting position most of the time	21- 23
Light work in setting position most of the time	19
Light work with standing most of the time	18
Heavy work with standing most of the time	17
Heavy labor	15 - 16

Source (Awad, and El Jundi, 2003).

Annex 4

Threshold limits To the Illumination In according to the work activities

	The activity		Minimum level/lux		Recommended lux
			from	to	
Activities need mild accuracy:	1- connection of large piece and construction		100	300	400
	2- works with machines or over the counter	○ activities need moderate accuracy	500	700	1000
		○ activities need high accuracy	700	1200	1500
		○ activities need extra accuracy	1500	2000	3000

Source: Arab labor organization 1999.

Annex 5

Threshold limit values for continuous noise

Noise level db	80	85	90	95	100	105	110	115
Daily exposure period in hours	16	8	4	2	1	1/2	1/4	1/8

Source: Arab labor organization 1999.

Threshold limit values for impact noise.

Noise level dB	150	145	140	135	130	125	120	115
Total Frequency of exposure per day	10	30	100	300	1000	3000	10000	30000

Source: Arab labor organization 1999.

Annex 6

Electrical Hazards to Humans

Probable Effect on Human Body	Current Level (In milliamperes)
Perception level. Slight tingling sensation. Still dangerous under certain conditions. (Water/wet conditions)	1 mA
Slight shock felt; not painful but disturbing. Average person can let go. However, strong involuntary reactions to shocks in this range may lead to injuries. (Muscular contraction can prevent the victim from getting free)	5 mA
Painful shock, muscular control is lost. This is called the freezing current or “let-go” range.	6-30 mA
Extreme pain, respiratory arrest, severe muscular contractions. Individual cannot let go. Death is possible.	50-150 mA
Ventricular fibrillation (the rhythmic pumping action of the heart ceases.) Muscular contraction and nerve damage occur. Death is most likely.	1000-4300 mA
Cardiac arrest, severe burns and probable death.	10,000 mA

(OSHA, 2009)

Annex 7

Fire Extinguisher Characteristics

Fire class	Extinguisher contents	Mechanism	Disadvantages
A	Foam, water, dry chemical	Chain breaking cooling, smothering, and diluting	Freezing if not kept heated
B	Dry chemical, bromotrifluoromethane, an other halogenated compounds, foam, co2,	Smothering, cooling, and shielding	Halogenated compounds are toxic
C	bromotrifluoromethane, co2, dry chemical	Chain breaking, smothering, cooling, and shielding	Halogenated compounds are toxic, fires may ignite after co2 dissipates.
D	Specialized powders such as graphite, sand, limestone, soda ash, sodium chloride	Cooling, smothering	Expensive cover of powder may be broken with resultant reignition.

(HSE, 2005)

Annex 8

Map of Palestine



Source: MOH, 2000

Annex 9

Map of Gaza Strip



Source: [www. Islamonline.net](http://www.Islamonline.net)

Annex 10

4

Palestinian National Authority
Ministry of Health
Helsinki Committee



السلطة الوطنية الفلسطينية
وزارة الصحة
لجنة هلسنكي

التاريخ 7/6/2010

Name:

الاسم: منار أحمد حمد

I would like to inform you that the committee
has discussed your application about:

نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم
حول:-

**Assessment of the occupational health
standards in vocational training centers-Gaza
Governorates.**

In its meeting on June 2010
and decided the Following:-

و ذلك في جلستها المنعقدة لشهر 6 2010

و قد قررت ما يلي:-

To approve the above mention research study.

الموافقة على البحث المذكور عاليه.



Signature
توقيع

Member

Member

Chairperson

عضو

عضو

Conditions:-

- ❖ Valid for 2 years from the date of approval to start.
- ❖ It is necessary to notify the committee in any change in the admitted study protocol.
- ❖ The committee appreciate receiving one copy of your final research when it is completed.

موافقة لاجراء بحث

المشارك / والمشاركة.....المحترم/ة

اقوم بدراسة حول تقييم معايير السلامة و الصحة المهنية في مراكز التدريب المهني في محافظات قطاع غزة والتي تهدف الى تحسين نوعية الخدمة المقدمة و المحافظة على سلامة المتدربين و مدربينهم. مع العلم أن هذه الدراسة هي متطلب للحصول على درجة الماجستير في الصحة العامة من جامعة القدس _ ابو ديس.

اتطلع لمشاركتكم في اتمام هذه الدراسة الغير ممولة من أي جهة كانت ولن يترتب على مشاركتكم فيها أي التزامات أكثر من الوقت اللازم لتعبئة الاستبيان.

وأود إعلامكم انه في حال موافقتكم على تعبئة الاستبيان من حقكم عدم اجابة اي سؤال لا تريدون الاجابة عنه و ستكون جميع المعلومات سرية لان الاهتمام فقط من الناحية البحثية فقط.

شاكرا لكم حسن تعاونكم

الباحثة

منار أحمد حمد

0598927865

manarasamra@hotmail.com

Annex 12

Self-Administered Questionnaire (Arabic Copy)

الرقم المتسلسل.....	المحافظة..... المركز.....	التاريخ.....
البيانات الشخصية		
1- الجنس	<input type="checkbox"/> ذكر <input type="checkbox"/> انثى	2- العمر
3- سنوات الخبرة	<input type="checkbox"/> 1-5 <input type="checkbox"/> 6-10 <input type="checkbox"/> 11-15 <input type="checkbox"/> أكثر من 15	
4- الحالة الاجتماعية	<input type="checkbox"/> متزوج <input type="checkbox"/> أعزب <input type="checkbox"/> مطلق <input type="checkbox"/> أرمل	
5- المهنة السابقة.....	6- المهنة الحالية.....	
7- المؤسسة	<input type="checkbox"/> وكالة <input type="checkbox"/> وزارة العمل <input type="checkbox"/> وزارة الشؤون الاجتماعية <input type="checkbox"/> مؤسسة غير حكومية	
8- سنوات التعليم		
التدريب		
9- هل تلقيت أي تدريب على السلامة المهنية في المركز؟	<input type="checkbox"/> نعم <input type="checkbox"/> نوعاً ما <input type="checkbox"/> لا	
10- هل تلقيت تدريب حول ممارسات العمل الآمنة؟	<input type="checkbox"/> نعم <input type="checkbox"/> نوعاً ما <input type="checkbox"/> لا	
11- هل تلقيت تدريب على مهارات الإسعاف الأولي؟	<input type="checkbox"/> نعم <input type="checkbox"/> نوعاً ما <input type="checkbox"/> لا	
12- هل تلقيت تدريب على استعمال طفاية الحريق؟	<input type="checkbox"/> نعم <input type="checkbox"/> نوعاً ما <input type="checkbox"/> لا	
معدات الوقاية الشخصية		
13- هل يوفر المركز معدات الوقاية الشخصية للمتدربين؟	<input type="checkbox"/> نعم <input type="checkbox"/> نوعاً ما <input type="checkbox"/> لا	
إذا نعم	إذا لا اذهب لسؤال رقم (18)	

14- هل تدرب المتدربين على استعمال معدات الوقاية الشخصية؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
15- هل يتم صيانة هذه المعدات بشكل منتظم؟	<input type="checkbox"/> نعم		<input type="checkbox"/> لا
16- هل تتابع المتدربين على استعمال معدات الوقاية الشخصية؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
17- هل تعتقد أن معدات الوقاية المستخدمة مناسبة لطبيعة التدريب؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
مواصفات المؤسسة			
18- هل يوفر المركز فحص طبي للمتدربين قبل بدء برنامج التدريب؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
19- هل يوفر المركز فحص طبي للمتدربين أثناء فترة التدريب؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
20- هل تظهر الإدارة أي اهتمام نحو السلامة في العمل؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
21- هل تعتقد أن بيئة العمل لديك آمنة؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
22- هل لدى المركز موظف متخصص في الصحة و السلامة المهنية؟	<input type="checkbox"/> نعم		<input type="checkbox"/> لا
بيئة التدريب			
23- هل يتم صيانة معدات التدريب بشكل منتظم؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
24- هل آلات و ماكينات التدريب مرتبة بشكل يسهل الحركة في الورشة؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
25- هل ماكينات التدريب عليها حاجز واقٍ؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
إذا نعم	إذا لا اذهب لسؤال (28)		
26- هل تستخدم الحواجز أثناء العمل على الماكينة؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
27- هل تتابع المتدربين ليستخدموا الحواجز الواقية؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
28- هل في الورشة مكان خاص للتخزين؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا

29- هل تتابع المتدربين أثناء عملهم على الماكينات و الآلات؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
30- هل المعدات اليدوية المستخدمة آمنة للاستعمال؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
31- هل يوجد مكان خاص لحفظ المعدات اليدوية و ترتيبها بشكل آمن؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
32- هل يتلقى المتدربين تدريباً على مهارات الإسعاف الأولي؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
33- هل يوجد في الورشة صندوق إسعاف أولي بالمواد اللازمة؟	<input type="checkbox"/> نعم		<input type="checkbox"/> لا
34- هل يتلقى المتدربين تدريب على استعمال طفايات الحريق؟	<input type="checkbox"/> نعم		<input type="checkbox"/> لا
35- هل تحافظ على نظافة الورشة؟	<input type="checkbox"/> نعم		<input type="checkbox"/> لا
36- هل يحتوي برنامج التدريب على مساق السلامة والصحة المهنية؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
37- هل تعتقد أن الورشة تحتاج إلى تغييرات فيما يخص السلامة والصحة المهنية؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
إذا نعم أو نوعاً ما	إذا لا اذهب لسؤال(38)		
الشروط الصحية في المركز			
38- هل يوجد في الورشة مكان خاص لتغيير الملابس؟	<input type="checkbox"/> نعم		<input type="checkbox"/> لا
39- هل يحصل المتدربين على فترات راحة مناسبة؟	<input type="checkbox"/> نعم	<input type="checkbox"/> نوعاً ما	<input type="checkbox"/> لا
40- هل يوجد أماكن خاصة للراحة للمتدربين؟	<input type="checkbox"/> نعم		<input type="checkbox"/> لا
41- هل يوفر المركز مياه شرب ذات جودة عالية؟	<input type="checkbox"/> نعم		<input type="checkbox"/> لا
42- هل الحمامات عددها كافي للمتدربين؟	<input type="checkbox"/> نعم		<input type="checkbox"/> لا

الرجاء أجب عن الأسئلة التالية:

- 1- ما هو المقصود بالصحة و السلامة المهنية؟
- 2- ما المقصود بالمرض المهني؟
- 3- ما هو الخطر المهني؟
- 4- ما المقصود ببيئة العمل الآمنة؟
- 5- ما نوع الإصابات التي يتعرض لها المتدربين في المركز؟

Annex 13

Checklist (Arabic Copy)

صحيفة تقييم للورش في مراكز التدريب المهني لم محافظات غزة

المركز :				المحافظة: الجهة:
طبيعة العمل في الورشة				التاريخ:
موجود			غير موجود	
سيء	مقبول	جيد		
				الحريق
				1- الطفايات في المكان المناسب و محدد عليها نوع الاستعمال و فحصت منذ وقت قريب
				2- العلامات التي تدل على مخرج الطوارئ واضحة
				3- وجود مخارج الطوارئ و تفتح بسهولة من الداخل
				4- مخارج الطوارئ خالية من المعيقات
				5- نظام إنذار يعمل بكفاءة
				6- التعليمات في حالة الحريق موجودة
				7- نقاط التجمع في حال الحريق معروفة و موضحة
				8- التدريب على الإخلاء في الحريق يطبق
				الكهرباء
				9- عدم وجود أي قطع في الأسلاك و الوصلات الكهربائية
				10- لا يوجد تلف في المفاتيح أو المآخذ
				11- الأدوات الكهربائية المتحركة بحالة جيدة
				12- لا يوجد أسلاك على الأرض
				13- وجود أجهزة لقطع التيار الكهربائي في حالة الطوارئ
				الإضاءة
				14- الإضاءة ملائمة لطبيعة العمل
				15- الإضاءة الطبيعية جيدة
				16- عدم وجود توهج أو انعكاس
				17- إضاءة الطوارئ متوفرة
				المواد الكيميائية في الموقع
				18- جميع عبوات المواد الكيميائية عليها رقعة توضح محتوياتها و الاستعمال الآمن
				19- وجود محزن خاص للمواد الكيميائية
				20- يتم التخلص منها بطريقة آمنة
				الإسعاف الأولي

				21- صندوق الإسعافات متوفر بجميع محتوياته
				22- سهولة الوصول لصندوق الإسعافات
				24- الجميع يعرف مكان الصندوق
				الأرضية
				25- ملساء و بدون حفر أو شقوق
				26- عدم وجود زيوت أو مواد لزجة
				27- المدخل و الممرات خالية من المعوقات
				28- الرؤية واضحة في التقاطعات
				الماكينات و الأدوات
				29- نظيفة
				30- الحواجز الواقية متوفرة
				31- مفتاح التشغيل و الإغلاق سهل الوصول
				32- صيانة منتظمة و مجدولة
				33- المساحات حول الماكينات كافية للعمل عليها
				34- التحكم في الضوضاء الصادرة عنها
				35- الإضاءة على الماكينات كافية
				التخلص من النفايات
				36- سلال النفايات متوفرة و بها كيس نايلون
				37- يتم تفريغ السلال بشكل منتظم
				38- الخرق المبللة بالزيوت و الشحوم توضع في حاويات مغلقة
				البيئة الداخلية
				39- التهوية الطبيعية
				40- نظام التهوية
				أ- خالي من الأغبرة الأتربة
				ب- النظام يتحكم في الدخان و الغبار
				ج- الشفط لخارج الورشة
				41- درجات الحرارة مريحة
				42- إشارة ممنوع التدخين في الورشة
				43- مستوى الضوضاء حسب المعايير المسموح بها
				44- لوحات إرشادية
				معدات الوقاية الشخصية
				45- المعدات متوفرة و بحسب طبيعة العمل
				46- المتدربين يستخدمون معدات الوقاية الشخصية
				47- تم تدريبهم على استخدام المعدات
				47- يتم صيانة المعدات بشكل منتظم
				49- المعدات تطابق المعايير المطلوبة
				المخازن

				50- المواد الخطرة المخزنة عليها رقعة التعريف
				51- مكان المخزن واضح و معرف
				52- التهوية في المخزن
				53- المواد المخزنة مرتبة بطريقة سليمة تمنع الحوادث
				54- المواد الخطرة معزولة
				الأدوات و المعدات اليدوية
				55- في حالة جيدة
				56- تلاءم طبيعة العمل
				57- ذات نوعية جيدة
				57- تستخدم لنفس الهدف
				59- تم تدريب المتدربين على استعمالها
				60- لها مكان مخصص للتخزين و بشكل مرتب
				خطة طوارئ
				61- خطة طوارئ متوفرة
				62- خطة الطوارئ معلقة في مكان يراه الجميع
				63- خطة إخلاء جاهزة و يتم التدريب عليها مرة في السنة على الأقل
				64- معدات الطوارئ في المتناول
				65- صفاة إنذار متوفرة
				مكان العمل
				66- ارتفاع سطح العمل مناسب لأداء العمل
				67- ترتيب مكان العمل يمنع الأوضاع المجهدة لجسم المتدرب
				67- المعدات الثقيلة أو التي تستخدم بشكل متكرر تخزن على ارتفاع مناسب
				69- المتدربين محميون من الأجسام الحادة و المتطايرة
				المواد الخطرة
				70- تم تعريف المواد الخطرة للمتدربين
				71- المتدربين يعرفون التأثيرات الضارة لها
				72- مستوى التعرض لها
				73- خطة الطوارئ في الموقع

Explanatory Letter

Self-administered Questionnaire

Dear Participant

Thank you for your participation in this research; you were selected because you met the selection criteria of participation.

This study is carried out as a part of the requirements for the master degree in Public Health/Environment Health at Al Quds University-Palestine.

This study aims to assess the occupational safety and health in the vocational training centers in Gaza Governorates.

Your participation is voluntary, and you have the right to withdraw at any time during data collection. Your answers will be kept confidential and only it is requested from you to answer the questionnaire that may not take more than 15 minutes of your time.

If you have any inquiry about the questionnaire, don't hesitate to call (0598927865).

Researcher: Manar Hamad

Annex 15

Questionnaire (English copy)

Trainers Questionnaire - English Version

Serial number.....	Governorate..... Center	Date.....
Personal Characteristics		
1. Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female
2. Age.....		
3. Experience years	<input type="checkbox"/> 1-5	<input type="checkbox"/> 6-10
	<input type="checkbox"/> 11-15	<input type="checkbox"/> more than 15
4. Social status	<input type="checkbox"/> Married	<input type="checkbox"/> Single
	<input type="checkbox"/> Divorced	<input type="checkbox"/> Widow
5. Previous occupation.....	6. Current Occupation	
7. Center	<input type="checkbox"/> UNRWA <input type="checkbox"/> Ministry of labor <input type="checkbox"/> Ministry of social welfare <input type="checkbox"/> NGOs	
8. years of education	
Training		
9. Have you received training on occupational safety in the center?	<input type="checkbox"/> Yes <input type="checkbox"/> To some extent <input type="checkbox"/> No	
10. Did you receive training on safe work practices?	<input type="checkbox"/> Yes <input type="checkbox"/> To some extent <input type="checkbox"/> No	
11. Did you receive training on first aid skills?	<input type="checkbox"/> Yes <input type="checkbox"/> To some extent <input type="checkbox"/> No	
12. Did you receive training on use of fire distinguishers ?	<input type="checkbox"/> Yes <input type="checkbox"/> To some extent <input type="checkbox"/> No	
Personal Protective Equipments (PPE)		
13. Does the center provide personal protective equipment (PPE) to the trainees?	<input type="checkbox"/> Yes <input type="checkbox"/> To some extent <input type="checkbox"/> No	
If yes	If No go to question (18)	
14. Do you provide training on use of PPE to the trainees?	<input type="checkbox"/> Yes <input type="checkbox"/> To some extent <input type="checkbox"/> No	

15. Do the trainees use the PPE regularly?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
16. Do you follow up the trainees to use PPE?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
17. Do you think the PPEs appropriate for the training purposes?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
Institutional Characteristics		
18. Does the center provide medical check up to the trainees prior to the training program?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
19. Does the center provide follow up medical check up to the trainees during the training program?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
20. Does the administration show any concern towards safety at work?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
21. Do you think that your work environment is safe?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
22. Does the center have special employer responsible for safety and hygiene at work?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Training environment		
23. Do you do regular maintenance to the training equipments?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
24. Do the training machines and equipments are arranged in way that makes movement easy in the workshop?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
25. Do the training machines have protective barriers ?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
If yes	If No go to question(28)	
26. Are they used during the work on the machines?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
27. do you follow the trainees to use the protective barriers?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
28. Do you have special store for the workshop?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
29. Do you supervise your trainees during the work with machines and equipments?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
30. Are the hand tools used by the trainees safe to use?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
31- Do you have special place to keep and safely arrange the hand tools?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
32. Do the trainees receive training on first aid skills?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
33. Does your workshop have first aid box with its materials?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

34. Do trainees receive training on the use of fire distinguishers?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
35. Do you keep the workshop clean?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
36. Does the training program have special curriculum for occupational safety and health?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
37. Do you think your workshop needs changes regarding the occupational safety and hygiene?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
If yes or to some extent	If No go to question(38)	
Hygiene Conditions In The Center		
38. Does your workshop have special place for cloths change?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
39. Do the trainees have adequate rest periods?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
40. Are there special places for trainees to rest ?	<input type="checkbox"/> Yes	<input type="checkbox"/> To some extent <input type="checkbox"/> No
41. Does the center provide good quality drinking water?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
42. Are the bathrooms enough for the trainees?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

Please answer these questions :

- 1- What is meant by occupational safety and hygiene?
- 2- What is meant by occupational disease?
- 3- What is the occupational hazard?
- 4- What is meant by safe work environment?
- 5- What are the accidents your trainees have during training?

Thank you

Annex 16

Checklist English copy

Fire hazard	NA	present		
		bad	accepted	good
Fire distinguishers in place and inspection				
Clean signs of emergency doors				
Emergency doors present				
Emergency exits free of obstacles				
Effective alarm system				
Instructions in case of fire				
Assembly areas well defined				
Training on evacuation				
Electrical hazard				
Condition of the wires				
The switches and points				
Mobile electrical devices in good condition				
No wires on the floor				
Emergency switch off				
illumination				
Lighting is suitable for the type of work				
Nature lighting is good				
Emergency lighting				
Chemical hazard				
Material safety data sheet				
Special store for chemicals				
Safe disposal of the chemical wastes				
First aid				
First aid box and materials				
Easy access to the first aid box				
First aid box place is known to every one				
The floor				
Smooth without holes				

Presence of oil or greases				
Entrance and passage ways free of obstacles				
Vision is clear at crossings				
Machines and equipment				
Clean				
Safeguards present				
Off Switches easily reached				
Regular maintenance				
Spaces around it good for work performance				
Its noise is controlled				
Lighting on it				
Waste disposal				
Waste baskets available and has sacs				
Waste baskets emptied regularly				
Socked cloths kept in closed containers				
Indoor environment				
Natural ventilation				
Ventilation system				
Temperature is comfortable				
No smoking sign				
Level of noise				
Guidance and warning signs				
Personal protective equipment				
Availability of PPE				
PPE usage by the trainees				
Trainees training on PPE usage				
PPE maintained regularly				
PPE suitable to the type of work				
The stores				
MSDS on the stored chemicals				
Place of the store is clear				
Good ventilation of the store				
Safe arrangement of stored materials				
Isolation of the hazardous materials				

Hand tools				
In good condition				
Suitable to the work type				
With high quality				
Used for its purpose				
Trainees training on it				
Special store				
Emergency plans				
Availability of the emergency plans				
Present in clear place				
Evacuation plan present and training done				
Emergency tools available				
Alarm is present				
Workplace				
The height is suitable				
Workplace arranged in way prevents whickered positions				
Heavy frequent used tools stored in suitable height				
Trainees protected from sharp flying objects				
Hazardous materials				
Hazardous materials known to the trainees				
Trainees know its effects				
Level of exposure				
Emergency plan present				

Annex 17

Names of experts

- ❖ Dr. Zakary El Assar.
- ❖ Dr. Faraj Abu Shamala.
- ❖ Dr. Abed El-Shukry.
- ❖ Dr. Mohammed EL-Aila
- ❖ Dr. Ayman Abu Samra.
- ❖ Dr. Ahmed Juda
- ❖ Dr. Saied Al Mudallal.
- ❖ Mr. Abed El-fatah El Dugi
- ❖ Mr. Jamiel Hamad.
- ❖ Mr. Nabil Salha.

Annex 18

ملخص الدراسة:

يعتبر التدريب المهني أداة فاعلة في تنمية و تطوير المجتمعات. المتدربين المهنيين هم إنتاج التدريب المهني و أدواته في التطوير. سلامة وصحة هذه الفئة عنصر أساسي حتى تتم هذه التنمية.

أهداف الدراسة:

تهدف هذه الدراسة لتحقيق الأهداف التالية:

- تقييم مستوى تطبيق معايير السلامة و الصحة المهنية في مراكز التدريب المهني في محافظات قطاع غزة
- تحديد معايير السلامة و الصحة المهنية التي يجب تطبيقها في مراكز التدريب المهني
- التعرف على نقاط الضعف لدى المدربين في مراكز التدريب المهني فيما يخص السلامة و الصحة المهنية
- تقديم توصيات لتحسين بيئة التدريب في مراكز التدريب المهني في قطاع غزة

منهجية الدراسة:

لقد استخدمت الدراسة الوصفية لتحديد معايير السلامة والصحة المهنية الواجب توافرها في مراكز التدريب المهني. العينة اشتملت عينة الدراسة على جميع المدربين المهنيين في مراكز التدريب المهني في قطاع غزة و كان إجمالي العدد 104 مركز وجميع ورش التدريب في هذه المراكز. بلغ نسبة الاستجابة 95% من المدربين. تم جمع المعلومات باستخدام استبانة بعد أن تم فحصها من الناحية العلمية من قبل محكمين بالإضافة لاجراء دراسة تجريبية قبل البدء بالبحث وتم استخدام صحيفة تقييم للورش. و لقد تمت الدراسة في أبريل 2011. و تم تحليل الاستبانة و صحيفة التقييم باستخدام وبرنامج احصائي SPSS

نتائج الدراسة:

أظهرت الدراسة أن المدربين في هذه المراكز هم مؤهلون حيث أن 54% منهم لديه سنوات خبرة أكثر من 10 سنوات. و أن 70% من المدربين تلقوا تدريباً حول السلامة والصحة المهنية و لكن أكثر من 80% من المدربين لم يعرفا مفاهيم السلامة و الصحة المهنية التي تم السؤال عنها في الدراسة. و بحسب 80% من المدربين فإن المراكز تزود المتدربين بمعدات الوقاية الشخصية. و لكن نتائج تحليل صحيفة التقييم أظهرت أن 50% من الورش لا يوجد معدات وقاية شخصية . فقط بحسب 26% من المدربين يوجد لديهم في المراكز مشرف سلامة وصحة مهنية. 76% من المدربين يعتقدون أن الورش لديهم تحتاج لتغييرات فيما يخص السلامة و الصحة المهنية. يوجد منهاج خاص للصحة و السلامة المهنية في البرامج التدريبية و ذلك بحسب 87% من المدربين. و أظهرت الدراسة أيضاً أن 84% من الورش ليس لديهم خطة للطوارئ و أن 71% من الورش ليس لديهم جهاز إنذار فعال. 85% من الورش ليس لديها أي احتياطات فيما يخص خطر الحرائق. في 90% من الورش مخاطر الكهرباء مسيطر عليها, الإضاءة سيئة و لا تلائم طبيعة العمل في ثلث الورش, أكثر من 60% من الورش ليس لديها نظام تهوية. لا يوجد صندوق إسعاف أولي و بالمحتويات الخاصة في 40% من الورش. كما أظهرت الدراسة أن الإصابات الأكثر شيوعاً بين المتدربين هي الجروح 38% الحروق و إصابات العيون 15% الكسور 12% الصدمة الكهربائية 9%.

التوصيات:

- ضرورة الإهتمام بفاعلية برامج التدريب الخاص بالسلامة و الصحة المهنية المقدم للمدربين
- ضرورة تطبيق معايير السلامة و الصحة المهنية في ورش مراكز التدريب المهني
- ضرورة أن تتبنى مراكز التدريب المهني برامج تدريب للسلامة و الصحة المهنية للمتدربين كجزء من التدريب المهني
- ضرورة وضع خطط للطوارئ في المراكز و تكون معروفة للمدربين و المتدربين
- ضرورة إجراء دراسات مستقبلية حول فعالية برامج التدريب الخاصة بالسلامة و الصحة المهنية المقدمة للمدربين و المتدربين