

An-Najah National University
Faculty of Graduate Studies

Development of a Conceptual Framework for Occupational Safety and Health in Palestinian Manufacturing Industries

By
Hanan Saleem Tuhul

Supervisor
Prof. Amer El-Hamouz

**This Thesis is Submitted in Partial Fulfillment of the Requirements for
the Degree of Master of Engineering Management, Faculty of Graduate
Studies, An-Najah National University, Nablus, Palestine.**

2018

Development of a Conceptual Framework for Occupational Safety and Health in Palestinian Manufacturing Industries

**By
Hanan Saleem Tuhul**

This Thesis was defended successfully on 23/12/2018 and approved by

Defense Committee Members

Signature

1. Prof. Amer El-Hamouz / Supervisor

2. Prof. Issam Al-Khatib / External Examiner

3. Dr. Abdel-Fattah Al-Mallah / Internal Examiner

Dedication

To my father, Saleem Mohammed Tuhul, my first love, the man who gave me my name as a piece of his heart, whose heart was always my ever support, whose sweat, labor, tenderness, and strength gave me the power of this universe, and paved the way for me to be what I am now.

For my mother, who saw me with her heart before her eyes, and who never hesitated to support me and stand by my side.

For my brother, Khalid, my great wall and fort, my crown, and my pride.

For my sister, Kholood, for her heart, love, and support.

For my sister, Ohood, my second half, my soul mate, my happiness and madness, the one who always believed in me, and who shared with me the happiest and saddest moments

To the spirit of my heart's half, my brother "Ahmed", the light that left my life, to the smile I miss, to his morning's kiss, to his hugs, to him, may his soul rest in peace.

For my small and big family, for everyone who believes in me and in my abilities, thank you for everything, thank you for being part of my life.

Your daughter and sister, Hanan Saleem Tuhul.

Acknowledgment

After,

(الحمد لله الذي بعثني تيمنا صالحا)

First and foremost, my praise and thank are to Allah, the Almighty, who has completed His grace on me to accomplish my thesis, who gave me strength, patience, knowledge, and faith to fulfill this research and achieve this achievement, May Allah benefit me and the society from this research.

This thesis would never see the light without the guidance, supervision, encouragement, motivation, patience, and care of my supervisor prof. Amer El-Hamouz, I owe him heartfelt thanks, and great gratitude for his infinite support, great effort, valuable advice, and time, that he provided me through this research.

Also, I would like to express my gratitude and appreciation to all the academic staff of the Engineering Management Program in An-Najah National University for every single help, knowledge, guidance, and experience they gave me through the study courses and enriched my background to fulfill this research.

Great thanks to the thesis committee members for the time and efforts in reviewing this study and enriching it with their advice and experiences.

Special thanks to Mr. Hani Tareq Al Ahmad, the Director of economic statistics at the Palestinian Central Bureau of Statistics, the lecturer at Al Quds Open University, and the Regional Coordinator for transport statistics for the

Mediterranean States of the European Union, MEDSTAT program, for his great efforts, advice, and guidance through the questionnaires' analysis phase.

Other special thanks to both Dr. Bashar Abu Zaarour, the Director General of the Public Administration for Studies and Development in the Palestinian Capital Market Authority, and Mr. Amjad Jaddou, the Secretary-General of the Palestinian Federation of Insurance Companies, for the priceless information, advice, and help they added to this thesis.

My friends and colleagues, thousands of thanks for giving me unforgettable happy times and moments both inside and outside the university, you made my Master journey more valuable, and I am really proud to share these study years with you all.

Again, to my family; my father, mother, brothers, sisters for their endless love, and encouragement.

Finally, thanks for the study participants who did their best to enrich this research with valuable information.

إقرار

أنا الموقعة أدناه، مقدمة الأطروحة التي تحمل عنوان:

Development of a Conceptual Framework for Occupational Safety and Health in Palestinian Manufacturing Industries

أقر بأن ما اشتملت عليه هذه الأطروحة إنما هو نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيثما ورد، وأن هذه الرسالة كاملة، أو أي جزء منها لم يقدم من قبل لنيل أية درجة علمية أو لقب علمي أو بحثي لدى أية مؤسسة تعليمية أو بحثية أخرى.

Declaration

The work provided in this thesis, unless otherwise referenced, is the researcher's own work and has not been submitted by others, elsewhere for any other degree or qualification.

Students' Name:

اسم الطالبة: حنان سليم محمد طحل

Signature:

التوقيع:

Date:

التاريخ:

Table of Content

DEDICATION	III
ACKNOWLEDGMENT	IV
DECLARATION	VI
TABLE OF CONTENT	VII
LIST OF TABLES	XIV
LIST OF FIGURES	XVI
LIST OF APPENDICES	XVIII
LIST OF ABBREVIATIONS	XIX
GLOSSARY	XXII
ABSTRACT	XXV
CHAPTER ONE	1
INTRODUCTION	2
1.1 CHAPTER OVERVIEW	2
1.2 INTRODUCTION	2
1.3 THESIS PROBLEM	5
1.4 THESIS SCOPE	6
1.4.1 SCOPE JUSTIFICATION	8
1.5 THESIS AIM AND OBJECTIVES	9
1.6 THESIS QUESTIONS AND HYPOTHESES	10

1.8 THESIS SIGNIFICANCE	11
1.9 THESIS JUSTIFICATION AND MOTIVATION.....	12
1.9.1 THESIS JUSTIFICATION.....	12
1.9.2 THESIS MOTIVATION	13
1.10 THESIS ORIGINALITY	15
1.11 THESIS CONTRIBUTION	16
1.12 THESIS STRUCTURE.....	16
CHAPTER TWO.....	19
LITERATURE REVIEW.....	20
2.1 CHAPTER OVERVIEW	20
2.2 BACKGROUND.....	20
2.3 OCCUPATIONAL SAFETY AND HEALTH (OSH)	23
2.3.1 OCCUPATIONAL ACCIDENTS AND DISEASES.....	23
2.3.2 OSH STATISTICS AND RATES	25
2.3.2.1 OSH Calculations Formula	26
2.3.3 OSH REALITY IN DEVELOPING COUNTRIES	28
2.4 OSH AND DANGEROUS INDUSTRIES	34
2.5 OSH AND MANUFACTURING INDUSTRIES	37
2.5.1 MANUFACTURING IN THE DEVELOPED COUNTRIES	37
2.5.2 MANUFACTURING IN THE DEVELOPING COUNTRIES AND ME	40
2.6 OSH IN PALESTINIAN MANUFACTURING INDUSTRIES.....	43

CHAPTER THREE.....	54
THESIS METHODOLOGY	55
3.1 CHAPTER OVERVIEW	55
3.2 RESEARCH TYPE	55
3.3 RESEARCH METHODOLOGY	56
3.3.1 RESEARCH METHODOLOGY FLOW CHART	57
3.4 RESEARCH POPULATION AND SAMPLE	59
3.4.1 SAMPLING TECHNIQUE	60
3.5 DATA COLLECTION TECHNIQUES	64
3. 6 QUESTIONNAIRES	67
3.6.1 QUESTIONNAIRES DESIGNS	67
3.6.2 QUESTIONNAIRES VALIDITY.....	70
3.7 DATA COLLECTION.....	70
3.8 DATA ANALYSIS TECHNIQUES.....	75
3.8.1 QUALITATIVE DATA ANALYSIS	76
3.8.2 QUANTITATIVE DATA ANALYSIS.....	76
3.9 SAFETY CALCULATION PROCESSES	77
3.9.1 CATEGORIZED DATA	77
3.9.2 SAFETY CALCULATIONS	79
3.9.2.1 OSHA Formulas	79
CHAPTER FOUR.....	82

RESULTS' ANALYSIS AND DISCUSSION.....	83
4.1 CHAPTER OVERVIEW	83
4.2 QUALITATIVE DATA ANALYSIS	83
4.2.1 INTERVIEWS' ANALYSIS.....	84
4.2.1.1. <i>OSH System Development</i>	88
4.2.1.2. <i>Individuals Development</i>	88
4.2.1.3. <i>Stakeholders' Commitment</i>	89
4.2.1.4. <i>OSH Returns</i>	90
4.2.1.5. <i>OSH Challenges</i>	90
4.2.1.6. <i>OSH Success Factors</i>	91
4.3 QUANTITATIVE DATA ANALYSIS	91
4.3.1 SURVEYS' POPULATION	93
4.3.1.1 <i>Workplace Survey</i>	93
4.3.1.2 <i>Employees Sample</i>	98
4.3.2 OSH REQUIREMENTS	101
4.3.2.1 <i>OSH Requirements</i>	101
4.3.2.2 <i>OSH Tools</i>	101
4.3.2.3 <i>Health Services</i>	103
4.3.2.4 <i>Training Courses</i>	103
4.3.2.5 <i>OSH Insurance</i>	103
4.3.3 OCCUPATIONAL ACCIDENTS AND DISEASES.....	104
4.3.4 <i>OSH Awareness</i>	106
4.3.5 <i>Environmental Intentions</i>	110

4.3.6 External Correlation and Coordination	111
4.3.7 Testing Correlations among OSH Issues.....	112
4.4 OSH REALITY IN THE PALESTINIAN INDUSTRIES	112
4.4.1 THE OSH REQUIREMENTS.....	114
4.4.1.1 Basic Health and Safety Requirements	115
4.4.1.2 Personal Protective Health and Safety Requirements	124
4.4.2 OCCUPATIONAL ACCIDENTS AND DISEASES	127
4.4.2.1 The OSH Calculations Results.....	128
4.4.2.2 EU-OSHA Calculations	129
4.4.2.2 The Surveys' Results.....	143
4.5 RESULTS DISCUSSION.....	158
4.5.1 INTRODUCTION.....	158
4.5.2 SEVERITY OF INDUSTRIAL SECTORS	160
4.5.3 OSH CORRELATIONS.....	166
4.5.4 THE PALESTINIAN OSH REALITY AND SAFETY INGREDIENTS	184
4.5.4.1 System	187
4.5.4.2 Attitude	192
4.5.4.3 Fundamentals.....	194
4.5.4.4 Experience.....	195
4.5.4.5 Time.....	197
4.5.4.6 (YOU) Participants	198
4.5.4.7 Governments	208
CHAPTER FIVE.....	213

FRAMEWORK DEVELOPMENT	214
5.1 CHAPTER OVERVIEW	214
5.2 THE STATUS OF THE CURRENT OSH FRAMEWORK	214
5.3 OUTSTANDING OSH FRAMEWORK	218
5.3.1 OSH SYNDICATES	223
5.3.2 OSH FRAMEWORK TIME FRAME	225
CHAPTER SIX	228
CONCLUSIONS AND RECOMMENDATIONS	229
6.1 CHAPTER OVERVIEW	229
6.2 CONCLUSIONS	229
6.3 LIMITATIONS	231
6.4 RECOMMENDATIONS	234
6.5 FUTURE RESEARCH	235
REFERENCES	237
APPENDICES	256
APPENDIX (1): QUESTIONNAIRES	257
APPENDIX (1A)	258
APPENDIX (1B)	266
APPENDIX (1C)	275
APPENDIX (1D)	284
APPENDIX (1E)	293

APPENDIX (2): OSH STATISTICS	294
APPENDIX (2)	295
APPENDIX (3): OSHA RATES.....	298
APPENDIX (3)	299
APPENDIX (4): SPF & FSI.....	302
APPENDIX (4)	303
APPENDIX (5): SAFETY PILLARS	306
APPENDIX (5)	307
الملخص	ب

List of Tables

Table	Address	Page
Table (1-1)	The number of WB manufacturing establishments in the eight targeted manufacturing sectors, number of employees, and their GAV according to PSBC, 2016.	9
Table (2-1)	Some obstacles that hinder the development of OSH in the developing countries and ME.	29
Table (2-2)	Fatality Rates versus reporting percentages in Developed and Developing Areas.	32
Table (2-3)	Global estimates of the fatal occupational illnesses and the fatal occupational accidents.	33
Table (2-4)	Estimated number of deaths attributed to the most hazardous substances arranged in descending order.	33
Table (2-5)	Numbers and Rates of reported worker fatalities per Industry and Region between the years (2014-2016).	37
Table (2-6)	Occupational Fatality rates per 100,000 workers in the ME region.	43
Table (2-7)	The estimated percentage of the absence of the Basic Health and Safety Requirements (BHSR) according to Jaber et al., 2008; Zaghlool, 2008.	46
Table (2-8)	The main OSH statistics between the years (2009-2016) according to MOL.	49
Table (3-1)	The number of manufacturing establishments per industry according to the industries relative weight.	63
Table (3-2)	Distribution of manufacturing establishments and sample sizes regarding the years, relative weight, and obtained statistics.	64
Table (3-3)	Names of visited cities versus number of visited establishments.	71
Table (3-4)	Number of distributed and returned factories' questionnaires in relative to the industrial sector.	73
Table (3-5)	The number of employees' questionnaires in each industrial sector.	74
Table (3-6)	The number of final returned workplace questionnaires and filled out statistical tables by industrial sector.	78
Table (3-7)	The OSH statistics of each industrial sector between the years (2009-2016).	78
Table (4-1)	The interviewees' institutions and job positions.	86
Table (4-2)	The codes and the central themes developed regarding the discussed issues.	87
Table (4-3)	Cronbach Alpha values for employees' survey.	92
Table (4-4)	Cronbach Alpha values for employees' survey.	92
Table (4-5)	The percentages of employees' awareness to risk's sources.	107

Table (4-6)	The estimated percentages of the availability of the BHSR in the industrial establishments for the years; 2004, 2008, according to Jaber et al., 2008; Zaghlool, 2008, and the 2018 workplace questionnaire analysis.	116
Table (4-7)	The estimated percentages (%) of the BHSR in each industrial sector according to the employees and their employers.	118
Table (4-8)	The US-OSHA rates for each industrial sector and the entire industrial sector during the eight past years.	129
Table (4-9)	The EU-OSHA rates for each industrial sector and the entire industrial sector during the eight past years.	130
Table (4-10)	The Numbers of occupational accidents, injuries, fatalities, LWDs, and the financial losses in the Palestinian industrial manufacturing sectors in the last 8 years.	131
Table (4-11)	The workplace survey results for the occupational diseases types in the industrial sectors.	148
Table (4-12)	The industrial establishments' motivating incentives.	154
Table (4-13)	The inspectors' participation percentages.	157
Table (4-14)	Correlation Coefficients and hypotheses' testing decision for case correlation (1).	169
Table (4-15)	Correlation Coefficients and hypotheses' testing decision for case correlation (2).	172
Table (4-16)	Correlation Coefficients and hypotheses' testing decision for case correlation (3).	176
Table (4-17)	Correlation Coefficients and hypotheses' testing decision for case correlation (4).	178

List of Figures

Figure	Address	Page
Figure (1.1)	Thesis Aim, Objectives, and Expected Outcome.	10
Figure (1.2)	Thesis Challenges.	14
Figure (2.1)	Number and rate of fatal work injuries by industry sector, 2015.	34
Figure (2.2)	Number of manufacturing accidents of the total occupational accidents according to MOL and PICs reports (2015/2016).	51
Figure (3.1)	Research Methodology Flow Chart.	57
Figure (4.1)	Braun and Clarke, 2006 Thematic Analysis Approach Phases.	86
Figure (4.2)	The ranking of the responding sectors to workplace survey.	93
Figure (4.3)	The location of the workplace respondents.	94
Figure (4.4)	The Age of the responding establishments.	95
Figure (4.5)	The number of responding establishments per capital size.	96
Figure (4.6)	The responding establishments' size per sector.	96
Figure (4.7)	The workplace respondents' qualification level.	97
Figure (4.8)	The number of fixed/exposed employees in each industrial sector.	98
Figure (4.9)	The respondents' gender of the employees' survey.	98
Figure (4.10)	The distribution of the employees' age.	99
Figure (4.11)	The employees' respondents' qualification level.	100
Figure (4.12)	The employees' respondents' working experience.	100
Figure (4.13)	The percentages of the OSH tools' existence according to employees' survey analysis.	102
Figure (4.14)	The percentages of OSH tools' existence according to both employees' and workplace survey analysis.	102
Figure (4.15)	Percentages of insured industrial sectors according to workplace and employees' results.	104
Figure (4.16)	Estimated averages of exposed employees, occupational accidents, and lost working days per industrial sectors.	105
Figure (4.17)	Percentages of industrial wastes' disposing methods.	111
Figure (4.18)	The numbers of occupational accidents according to the MOL and PICs (2016-2017) reports (MOL, 2016), and those obtained from the industrial establishments during the research's survey.	113
Figure (4.19)	The sectors' ranking in providing BHSR.	126
Figure (4.20)	The sectors' ranking in providing PPHSR according to the employees and their employers.	127
Figure (4.21)	The ODIR/IR rates of the industrial sectors between the years (2009-2016).	135
Figure (4.22)	ASR/AFR rates of the industrial sectors between the years (2009-2016).	136
Figure (4.23)	The IR1 rates (per 100 full-time workers) for each industrial sector between the years (2009-2016).	142
Figure (4.24)	Departments' participation percentages in the employees' survey.	144

Figure (4.25)	General information of the exposed to risk employees in the industrial establishments.	145
Figure (4.26)	The OSH statistics in the industrial sectors between the years (2009-2016).	146
Figure (4.27)	The occupational diseases' percentages per industrial sectors according to the employees and their employers.	147
Figure (4.28)	The percentages of the occupational diseases types in the industrial sectors according to (a): Employees, (b): Workplace.	149
Figure (4.29)	The percentages of the industrial establishments' losses due to occupational accidents.	153
Figure (4.30)	The distribution of most rewarding sectors according to the employees and their employers.	154
Figure (4.31)	The percentages of OSH training courses in industrial establishments according to (a): Employees, (b): Workplace.	156
Figure (4.32)	Last time inspection processes for industrial sectors.	157
Figure (4.33)	The occupational injury rates (per 100,000) workers in Palestinian manufacturing industries compared to those of the number of national and international countries.	159
Figure (4.34)	The FSI indicators for the Palestinian industrial sectors between the years (2009-2016).	162
Figure (4.35)	The SPF indicators for the Palestinian industrial sectors between the years (2009-2016).	163
Figure (4.36)	The severity classification of the Palestinian industrial sectors according to the FSI indicator.	165
Figure (4.37)	The average number of working days lost per occupational accident in the Palestinian industrial sectors according to SPF indicator.	165
Figure (4.38)	The presentation of Case correlation (1) and its hypotheses testing.	170
Figure (4.39)	The presentation of Case correlation (2) and its hypotheses testing.	173
Figure (4.40)	The presentation of Case correlation (3) and its hypotheses testing.	177
Figure (4.41)	The presentation of Case correlation (4) and its hypotheses testing.	179
Figure (4.42)	The ingredients of a successful safety program according to Crawl and Louvar, 2002.	185
Figure (4.43)	The number of occupational accidents and injuries in the industrial establishments that claimed to develop OSH strategies between the years (2009-2016).	189
Figure (4.44)	The layers and responsibilities in the safety system.	199
Figure (5.1)	The Existing OSH Framework.	215
Figure (5.2)	The safety layers and OSH pillars.	218
Figure (5.3)	The structure of the proposed OSH syndicates.	225
Figure (5.4)	OSH Outstanding Conceptual framework.	227

List of Appendices

Appendix	Address	Page
Appendix (1): Questionnaires		257
Appendix (1A)	The English Version of the Workplace Questionnaire.	258
Appendix (1B)	The English Version of the Employees' Questionnaire.	266
Appendix (1C)	The Arabic Version of the Workplace Questionnaire.	275
Appendix (1D)	The Arabic Version of the Employees' Questionnaire.	284
Appendix (1E)	The List of the Questionnaires' Arbitrators.	293
Appendix (2): OSH Statistics		294
Appendix (2)	The Detailed OSH Statistics and Figures for the Entire and each Industrial Sector between the years (2009-2016).	295
Appendix (3): OSHA Rates		298
Appendix (3)	The Results of the US-OSHA & EU-OSHA Calculated Ratios for the Palestinian Industrial Sectors between the years (2009-2016) rounded to the Nearest Two Decimal Places.	299
Appendix (4): SPF & FSI		302
Appendix (4)	The Results of the Safety Performance Indicators for the Palestinian Industrial Sectors between (2009-2016) Rounded to the Nearest Two Decimal Places	303
Appendix (5): Safety Pillars		306
Appendix (5)	The OSH Pillars Connected to their Policies, Procedures, and Responsibilities.	307

List of Abbreviations

A

AFR: Accident Frequency Rate
 AFRO: Low- and middle-income countries of the African Region
 AMRO: Low- and middle-income countries of the Americas
 ASR: Accident Severity Rate

B

BLS: U.S. Bureau of Labor Statistics
 BHSR: Basic Health and Safety Requirements

C

CAPMAS: Central Agency for Public Mobilization and Statistics
 CBS: Statistics Netherlands
 CC: Capital Cost
 CD: Civil Defense
 COSHEP: The Palestinian National Center of Occupational Safety, Health,
 and Environmental Protection
 CPA: Consumer Protection Act

E

EMRO: Low- and middle-income countries of the Eastern Mediterranean
 Region
 EP: Egyptian Pound
 EU: European Union
 EURO: Low- and middle-income countries of the European Region

F

FAR: Fatality Accidents Rates
 F.E.Ms: Fire Extinguishing Means
 FR: Fatality Rate
 FSI: Frequency Severity Index

G

GAV: Gross Added Value
 GDP: Gross Domestic Product
 GFPTU: General Federation of Palestinian Trade Unions
 GOSI: Saudi General Organization for Social Insurance

H

HSE: Health and Safety Executives
 HIGH: High income countries

I

I.Es: Industrial Establishments

IL: Industrial Law

ILO: International Labor Organization

IR: Incident Rate / Workplace Injury Rate

IR1: OSHA Incident Rate (based on injuries and illnesses)

IR2: OSHA Incident Rate (based on lost workdays)

IS: Industrial Safety

ISIC: International Standard Industrial Classification

ISO: International Organization for Standardization

L

LL: Labor Law

LMIS: Labor Market Information System

LTC: Lost Time Case Rate

LWD: Lost Working Days

LWHs: Lost Working Hours

M

M.A: Manufacturing Accidents

ME: Middle East

MNE: Ministry of National Economy

MOE: Ministry of Environment

MOH: Ministry of Health

MOHE: Ministry of Education and Higher Education

MOL: Ministry of Labor

N

NII: The National Insurance Institute

NIS: New Israeli Shekel

NOSH / NOSHC: National Description of the Occupational Safety and Health

O

O.A: Occupational Accidents

O.D: Occupational Diseases

ODIR: Occupational Disease Incidents Rate

O.F: Occupational Fatalities

OHSAS 18001: Occupational Health and Safety Assessment Series

O.I: Occupational Injuries

OSH: Occupational Safety and Health

OSHA: Occupational Safety and Health Administration

OWD: Out of Work Days

P

Pal Trade: Palestinian Trade Centre
PCBS: Palestinian Central Bureau of Statistics
PCMA: Palestinian Capital Market Authority
P.D: Permanent Disabilities
PFI: Palestinian Federation of Industries
PGFTU: Palestinian General Federation of Trade Unions
PHL: Public Health Law
PICs: Palestinian Insurance Companies
PIF: Palestinian Insurance Federation
PLL: Palestinian labor law
PLIS: Palestinian Labor Inspection Services
PPHSR: Personal Protective Health and Safety Requirements
PSBC: Palestinian Standard Bureau of Statistics

S

SEARO: Low- and middle-income countries of the South-East Asia Region
SMEs: Small and Medium Enterprises
SPF: Safety Performance Factor
SPSS: Statistical Package for Social Sciences Program
SR: Severity Rate

T

TNO: Netherlands Organization for Applied Scientific Research
TWLH: Total Worked Labor Hours

W

WB: West Bank
WPRO: Low- and middle-income countries of the Western Pacific Region

Glossary

Accident: An unintentional, out of control bad event caused by error or by chance that leads to some damage or injury.

Accident frequency Rate: The indicator of how many injuries happened for every 1000000 hours worked over the past year which caused time lost.

Accident Severity Rate: The number of working days lost per 1000000 hours of work due to accidents.

Exploratory Research: A study that is conducted when not enough is known about a certain phenomenon, or when there is a little knowledge base which makes asking questions about what is happening is a necessity so as to seek new sights and familiarities to assess the phenomenon in a new light.

Fatal Accident Rate: The expected number of fatalities per 100 million exposure Hours of an activity.

Hazard: A chemical or physical condition that has the potential to cause damage to people, Property or the environment.

Incident: Any situation that unexpectedly arises in the workplace which has the potential to cause injury, damage or harm, caused by a miss or undesirable circumstances.

Incident Rate: Number of occupational injuries and/or illnesses or lost workdays per 100 full-time employees.

Inspection: Activities such as measuring, examining, testing, gauging one or more characteristics of a product or service, and comparing these with specified requirements to determine conformity.

Lost Work Days: Number of days (consecutive or not) after but not including the day of injury or illness during which the employee would have worked but could not do so, that is, during which the employee could not perform all or any part of his or her normal assignment during all or any part of the workday or shift because of the occupational injury or illness.

Lost Workday Rate: A mathematical calculation that describes the number of lost work days per 100 full-time employees in any given time frame.

Lost Time Case: Any occupational injury or illness which results in an employee being unable to work a full assigned work shift.

Lost Time Case Rate: A mathematical calculation that describes the number of lost time cases per 100 full-time employees in any given time frame.

Occupational Accident: Any occurring event arises during the working day leading to fatal or non-fatal injury.

Occupational Disease/illness: A chronic ailment or illness occurs as a result of a prolonged exposure to work hazards and work activities. Or, any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with employment. It includes acute and chronic illnesses or diseases that may be caused by inhalation, absorption, ingestion, or direct contact.

Occupational Diseases Incident Rate: Frequency of occupational diseases relative to the total time worked by all workers during the reporting period

Occupational Injury: Any injury such as a cut, sprain, or burn that results from a work accident or from a single instantaneous exposure in the work environment.

Occupational Safety and Health: The science of the anticipation, recognition, evaluation, and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment.

Research Methodology: The systematic rules and procedures in which the research-based and against which arguments of data and knowledge are assessed and evaluated. It is the general approach taken to carry out the research.

Risk: A measure of human injury, environmental damage, or economic loss in terms of both the incident likelihood and the magnitude of the loss or injury.

Severity: Seriousness of the consequences of an event expressed either as a financial value or as a category.

Severity Rate: A mathematical calculation that describes the number of lost days experienced as compared to the number of incidents experienced.

Stakeholders: People and organizations who may affect, be affected by, or perceive themselves to be affected by, a decision or an activity.

Total Incident Rate: A mathematical calculation that describes the number of the recordable incidents that a company experiences per 100 full-time employees in any given time frame.

Development of a Conceptual Framework for Occupational Safety and Health in Palestinian Manufacturing Industries

By

Hanan Saleem Tuhul

Supervisor

Prof. Amer El-Hamouz

Abstract

The annual increase in the number of occupational accidents and diseases in Palestinian manufacturing industries confirms a serious problem that threatens the safety and health of workers in the workplace. This study aims to analyze occupational safety and health (OSH) in the Palestinian industrial sectors in order to develop an OSH framework that is capable of effectively implementing the OSH law to reduce occupational accidents and diseases in the future. The study also aims at finding the different OSH rates using US-OSHA and EU-OSHA equations based on real statistics.

To achieve these goals and others, this thesis adopted the mixed method methodology, where seven semi-structured interviews were conducted and two structured questionnaires were designed. The results of the study revealed that about 61.0% of industry workers are exposed to work risk, 32.0% have experienced occupational accidents, while 9.0% suffer from occupational diseases. The average injury rate that amounted to (7,566) per 100,000 workers indicates a poor OSH level in the Palestinian manufacturing industries. On the other hand, the results of the Safety Performance Factor's (SPF) calculations confirmed that the leather sector is the most dangerous sector with an average of 145.6 off days/accident, while the Frequency Severity Index (FSI) stresses the seriousness of the metal industry sector with

respect to the severity and frequency of these accidents with an average of 3.8.

Accordingly, this thesis presents the development of an outstanding conceptual OSH framework based on safety and sustainable development pillars so as to; assure effective enforcement of the OSH law, and to prevent future occupational accidents and diseases.

Finally, this thesis is a great contribution to the OSH entities, literature reviews, and researchers. At the same time, this thesis provides important information and important results to support and promote essential future research in OSH disciplines.

Chapter One

Introduction

Chapter One

Introduction

1.1 Chapter Overview

This chapter provides a general overview of the thesis. It presents a brief introduction, thesis scope and scope justification, thesis problem, thesis aim and objectives, thesis questions and hypotheses, thesis significance, thesis motivation, thesis originality, thesis contribution, and finally thesis structure.

1.2 Introduction

For over a hundred years, the interest of developed and developing countries in the field of Occupational Safety and Health (OSH) has been significantly increasing. This is evident as it has become one of the most critical and distressful issues for the public and the private sectors, equally socially and economically. The complex contemporary economics are driven by various types of industries. One of the most dangerous industries in the world is known as (*Manufacturing Industries*) (Hämäläinen, 2007).

OSH is generally defined as; "the science of the anticipation, recognition, evaluation, and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment" (Alli, 2008). The OSH primary endeavor is to provide the highest physical, mental, and psychological protection, as well as social well-being for all working individuals wherever they work, and in every single occupation. Besides, it

stands to prevent the exposure of these workers to any kind of risks, injuries, and diseases resulting from the working conditions or work environment that could adversely affect their health and described as occupational accidents and occupational illnesses (OSHC, 2006).

Whilst the world is witnessing a technological development that enhances the workers' welfare and facilitates their work, it also poses an additional danger, a clear threat to human health and workplace safety (Baig & Narahari, 2011). No one denies that the industrial revolution and the shift of labor-oriented industries to more automated ones have helped to increase production and accelerate business.

The industrial accidents and diseases in the manufacturing industries are among the biggest dilemmas facing employees during their working life. The insertion of new materials, machines, equipment, and substances into the work process presents their users with new hazards that threaten the employees' health and well-being, the workplace safety, and the surrounding environment (Torun, 2014). The design of the new machinery or even the workplace environment was not focused on attaining safety. The lack of sufficient awareness by employees towards such automated environment exposed them to new OSH risks that were never known before (Baig & Narahari, 2011). In a way, "like an increase in the welfare returns as accidents at work, occupational illnesses and environmental pollution to humanity" (Torun, 2014), the economic development that built on the basis of weak OSH regulations is considered as an "invitation for accident" (Jilcha & Kitaw, 2017). The successive industrial accidents urged enterprises to put more importance on the OSH practices. Furthermore, the non-stopped

workplace accidents decisively contributed to reforming and evolving the OSH concept and scope (ILO, 2003). Industrial disasters that end with a large number of deaths, in particular, hit the global media. The safety and health of the workforce have recently attracted the attention of all; however, the fact is that there is a large number of people die every day all around the world while doing their jobs' activities. Much more, numerous daily fatalities are not reported but ignored (ILO, 2014).

Many countries began seriously to think about the OSH issues, problems, and their serious consequences for human and economic life as well.

In Palestine as in any other country, the Ministry of Labor (MOL) and other governmental and non-governmental institutions that concerned in the OSH issues also try to put efforts to improve the OSH field in the manufacturing industries (Atturk and Abu-Arra, 2014; NOSHC, 2015; ILO, 2017). Despite these efforts, the desperate working environments and working conditions that employees live, the poor awareness regarding OSH make it a necessity to study, analyze, and understand the problems and obstacles that hinder the enhancement of the OSH in manufacturing industries.

This thesis ultimate endeavor is to develop a conceptual safety and health framework that ensures a best effective mechanism to activate the Palestinian labor law (PLL) enforcement aiming to reduce the occupational accidents and diseases in the *Palestinian Manufacturing Industries*.

1.3 Thesis Problem

The Palestinian industrial sector in general and the Palestinian manufacturing sector in particular witness a large number of occupational accidents and diseases every day (Atturk & Abu-Arra, 2014). Despite the existence of the LL and some OSH provisions, the PLL still lacks many other important and vital ones (ILO, 2017). The absence of reliable and accredited information on accidents needed for the calculations of the Injury Rates (IR) and the Fatality Rates (FR) in the Palestinian manufacturing industries is a clear problem. The importance of OSH rates' calculations and the OSH statistics in determining the danger's levels of the industries, classifying them, and developing ways to secure them is one of the main reasons that call to find them out. Also, the great advantages of such calculations to all concerned parties starting from workers, employers, as well as insurance companies, have made it necessary to study and compile all the needed OSH figures for conducting the calculations and clarifying them.

On the other hand, the continuous oscillation of the injuries and fatalities' numbers, the interesting dramatic contrast between different statistics' sources within the same period of time, and the annual growth in industrial accidents and diseases show that; there is a serious problem threatening the safety and health of workers in the workplace. Besides, they illustrate why the occupational injuries and diseases represent a real challenge for the Palestinian manufacturing sector (Atturk & Abu-Arra, 2014). This fact was confirmed by the National Description of the Occupational Safety and Health (NOSH) which insisted that the published figures and statistics regarding

OSH are not 100% realistic and that the actual numbers in Palestinian manufacturing industries are undoubtedly much larger than reported (NOSHC, 2015). In spite of the great development in the labor market twenty years after the elimination of the Israeli sovereignty over Palestinian establishments, the spread of practical and theoretical awareness among the ranks of high academic workers, and the announcement of the PLL. Many and many problems threaten the workers' lives daily.

The various bad working conditions that employees live raise the possibility of exposure of the workers to accidents. Thus, the main concern of the thesis is to calculate the occupational injuries and fatality rates in Palestinian manufacturing industries and thus to develop a conceptual safety and health framework that reduces the occurrences of occupational accidents.

1.4 Thesis Scope

The scope of this research is the *Palestinian Manufacturing Industries*. This choice is not senseless or in vain at all, rather it is based on a prior long study. Despite the fact that the manufacturing sector is one of the most dangerous sectors around the world in terms of the occupational accidents and diseases, most of the studies that have been held in the OSH field in Palestine focused on the construction and quarries industries. The vision of this thesis is to highlight the manufacturing industries in Palestine on the one hand, and exceptionally try to choose the industrial establishments that have an active role in the manufacturing firstly, secondly include a large number of employees, and thirdly have a remarkable weight in the Palestinian economy.

According to NOSHC, 2015, manufacturing industries are considered among the most important industries in Palestine in terms of the number of employees and their impact on the Palestinian economy as well, making them a motivating and vital sector for research. It was reported by USAID and PFI, 2009 that the Palestinian industrial sectors employ about 13.00% of the total workforce and contribute 16.0% to the Gross Domestic Product (GDP). Moreover, the Palestinian industrial exports were (and still are) a good economic ambassador for the entire Palestinian cause.

According to the Palestinian Federation of Industries (PFI), the Palestinian manufacturing sector consists of 14 different industries. Refereeing to the Palestinian Central Bureau of Statistics (PCBS) the International Standard Industrial Classification (ISIC) Code for these industries is as follows:

1. The Garment Industries. (ISIC: C-14).
2. The Textile Industries. (ISIC: C-13).
3. The Metal and Engineering Industries. (ISIC: C-23).
4. The Paper Industries. (ISIC: C-17).
5. The Leather Industries. (ISIC: C-15).
6. The Precious Metals Industries. (ISIC: C-321).
7. The Food Industries. (ISIC: C-10).
8. The Renewable Energy Industries.
9. The Conventional Industries.
10. The Chemical Industries. (ISIC: C-20).
11. The Pharmaceutical Industries. (ISIC: C-21).
12. The Wood Industries. (ISIC: C-16).
13. The Plastic Industries. (ISIC: C-22).

14. The Aluminum Industries.

Where C; is the ISIC code for manufacturing.

1.4.1 Scope Justification

The targeted industries of this thesis are the following 8 manufacturing industries in West Bank (WB) region:

- The Metal and Engineering Industries.
- The Paper and Cartoon Industries.
- The Leather Industries.
- The Food and Beverages Industries.
- The Chemical Industries.
- The Wood and Furniture Industries.
- The Plastic Industries.
- The Aluminum Industries.

These manufacturing industries constitute 57.1% of the whole manufacturing sector in WB. Approximately 68.0% of the WB manufacturing establishments belong to these sectors. Furthermore, these manufacturing sectors contribute to about 640,218 thousand dollars of the total Gross Added Value (GAV) of the WB economy or about 56.0% of the total GAV. Besides, these sectors include more than 57.0% of the WB workforce.

Table (1-1) clarifies the number of WB manufacturing establishments in the eight targeted manufacturing sectors, number of employees, and their GAV according to PCBS reported statistics (PSBC, 2016).

Table (1-1): The number of WB manufacturing establishments in the eight targeted manufacturing sectors, number of employees, and their GAV according to PSBC, 2016.

ISIC	Manufacturing Sector	Number of Establishments	Number of Employees	GAV
10, 11	Food and Beverages	1,811	11,499	22.0%
15	Leather	434	3,549	2.5%
17, 18	Paper & Cartoon	343	2,308	3.3%
19, 20	Chemical	94	754	1.4%
22	Plastic	141	1,686	2.4%
16, 31	Wood & Furniture	2,875	10,958	14.3%
24, 25, 27, 28, 29	Aluminum & Metallurgical	3,250	8,595	10.0%
	Totals	8,948	39,346	55.9%

Respecting the Palestinian Trade Centre (Pal Trade), a notable percentage of the Palestinian top manufacturing exporters belong to these manufacturing sectors (Pal-Trade, 2015). This fact ensures again the vitality of these sectors, their economic importance equally to the country and to the people who work in them, and promotes the need to highlight OSH conditions there.

1.5 Thesis Aim and Objectives

Ensuring the OSH, as well as achieving the adequate level of reduction or elimination of risks in the workplace so as to protect human life, is now the biggest challenge for all practitioners, theorists, scientists, and institutions which are interested in OSH, and the primer aim of this research. The ultimate objective of this thesis is to achieve the expected outcome that represented in:

(Developing a conceptual safety and health framework that assures effective OSH law enforcement mechanism so as to reduce the occupational accidents).

Between the primary aim and the ultimate one, other detailed objectives are needed to be achieved. The primary aim, the detailed objectives, and the expected outcome of this thesis are all illustrated in Figure (1.1)

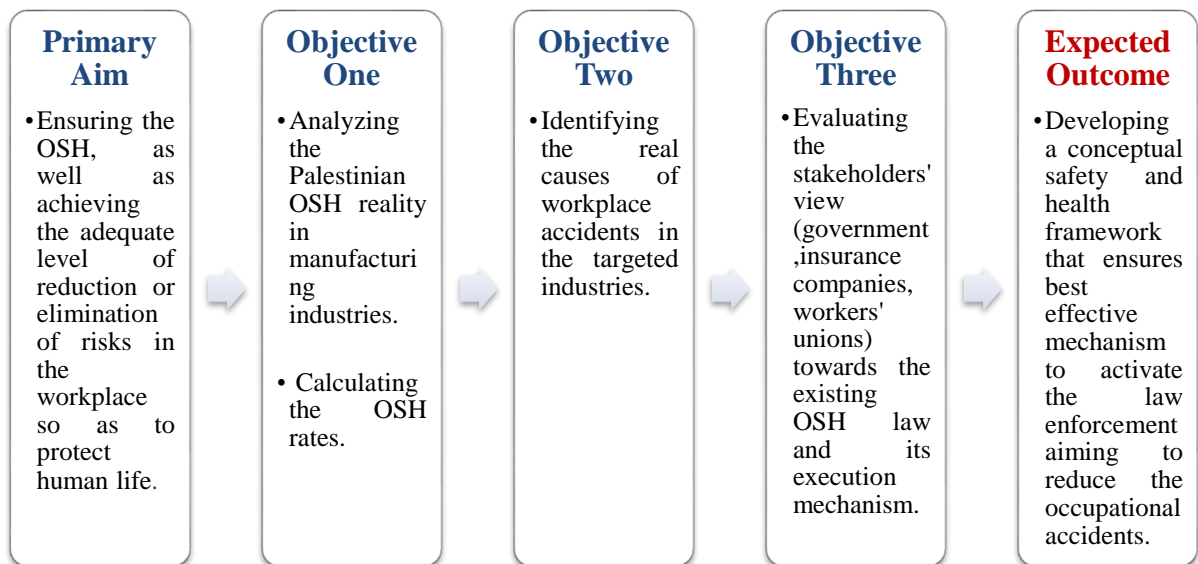


Figure (1.1): Thesis Aim, Objectives, and Expected Outcome.

1.6 Thesis Questions and Hypotheses

The main objective of this study is to develop a conceptual safety and health framework so as to reduce the probability of accidents' occurrence in the workplace. Based on this desire, studying the current OSH status in the Palestinian manufacturing sectors, calculating the OSH rates, perceiving the stakeholders' role in protecting workers and providing them a safe world of work is a necessity.

To reach this aim the following questions and hypotheses are postulated and examined:

❖ **Thesis Questions:**

Q1: Is the existence of the OSH law sufficient to mitigate and prevent accidents in the workplace?

Q2: Is the MOL solely responsible for ensuring the seriousness and effectiveness of law enforcement?

Q3: What components and ingredients are needed to develop an effective enforcement mechanism for the law to reduce accidents rates in the workplace?

❖ **Thesis Hypotheses:**

H1: There are substantial differences between the existing Palestinian OSH law and the OSHA standards.

H2: There is no significant impact of the Palestinian OSH law on the number of accidents in the workplace.

H3: There is no significant impact of different stakeholders' roles on the effective enforcement of the Palestinian OSH law.

1.8 Thesis Significance

Occupational health and the wellbeing of working people are crucial assets of individuals, communities, and countries. Workers represent half of the world's population and are the major contributors to economic and social development. Their health is determined not only by workplace accidents but also by social and individual factors and access to health services. Their work

sustains the economic and material basis of society which is critically dependent on their working capacity.

The importance of this research is manifested of promoting the concept of OSH of the owners of industrial establishments and increasing the level of awareness among employees towards their right to be safe in a secure working environment. Moreover, evaluating the role of the competent authorities in matters of occupational safety, the relations, and OSH law to preserve humanity and economic wealth is an unavoidable necessity.

1.9 Thesis Justification and Motivation

1.9.1 Thesis Justification

There is no doubt that the very real inducements and justifications mentioned in the previous section; (Thesis significance) are some of the most critical motivations for conducting this study. More than others, those which are fundamentally related to the individuals' health and lives who are working in these manufacturing sectors, and whose loss greatly means the collapse of the country and its economy. However, the main reasons for intentionally choosing manufacturing industries in this research are:

- i. The shocking numbers of occupational accidents and deaths that are reported daily through the country's media.
- ii. The repeated causes of occupational accidents without real solutions or future optimistic visions.
- iii. The ambiguity surrounding the impact of; law, officials, and those concerned with the OSH relating to the frightening announced statistics.

- iv. Features of conflict instead of cooperation between the different relevant parties; employers, employees, the right of law, insurance companies, and others.
- v. The Unawareness of individuals' rights or employees' rights. The lack of employees' perception about the seriousness of their right to be insured in a safe workplace, and a healthy work environment.
- vi. Lack and scarcity of national studies that deal with OSH issues in the manufacturing sector. (Most of the previously conducted studies focused on both Construction and Stone industries).
- vii. The false created picture of the OSH reality in the manufacturing sector. The manufacturing sector is described as problems-free sector despite its tough, poor, and negative OSH statistics, which is somehow equivalent to those in the two previously mentioned industries.

1.9.2 Thesis Motivation

All the justifications that were mentioned in the previous sub-section formulated the thesis actual motivation which is summarized in one single word (**Challenge**).

The OSH reality in the manufacturing sector generated three main dependent and independent challenges illustrated in Figure (1.2).

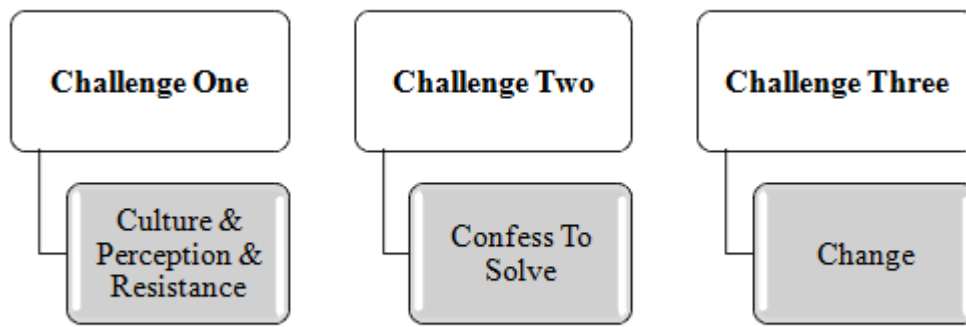


Figure (1.2): Thesis Challenges.

The first thesis challenge is to uncover the hidden problems and dangers surrounding employees and seriously threatening their lives, businesses, and exhausting the country's budget. The demonstration and clarification of the OSH reality in the Palestinian manufacturing sector and its potential hazards to the public are the first steps toward the change of the individuals' culture and awareness, and to curb their resistance to the transition from neglect to commitment as well. Besides, reflecting OSH facts forces officials to confess (the existence of a problem), and of course, once the problem is recognized, its solution can be found, this is the second challenge. The third challenge is the one that can be achieved as soon as both the first and second challenges are accomplished. Developing the OSH in the manufacturing industries, reducing the numbers of industrial accidents, promoting the roles of OSH stakeholders, and providing decision makers with an additional inductive power that justifies their valuation of the seriousness of the industrial sectors, is the thesis third and biggest challenge.

1.10 Thesis Originality

The study of developing an outstanding OSH framework in Palestine in general and in the manufacturing industrial sectors, in particular, is a novel study. Previous Palestinian studies such as Al Habeel and Aiesh, 2012; Mohammed, 2014; Abu Zeiter, 2018 were all discussing OSH procedures in general, except Al Moghny, 2006; Salem, 2009 who both discussed the OSH in the Manufacturing sector in Gaza strip and Tulkarm city respectively without trying to address the development of any system, modal, or framework to solve related safety problems. Besides them, Al-Khatib, et al., 2005 highlighted work injuries in Food and Metal shaping industries in Jericho city for comparison purposes. Recently, two ILO studies were conducted on Palestinian workplace, the first one discussed the situation of the Palestinian employees both in WB and the occupied Palestinian areas or the so-called (Israel) (ILO, 2017), while the second discussed the Palestinian unemployment problem (ILO, 2018a). Moreover, whilst some developing countries focused in their studies on the reality of OSH in the construction industries such as; Zekri, 2013, and Alhajeri, 2014, others gave a positive interest to the manufacturing sectors without also suggested solutions (Noweir et al., 2013).

In this study 8 Palestinian manufacturing sectors are targeted thoroughly to calculate for the first time; the OSH rates using the US-OSHA and EU-OSHA formulas so as to develop an OSH framework that reduces and prevents OSH accidents. These calculations are based on real data gathered from these sectors during field visits, interviews, and questionnaires.

1.11 Thesis Contribution

This study is the first in Palestine that applies the US-OSHA, and EU-OSHA equations to calculate missing Palestinian OSH rates. Therefore, this thesis contributes to; firstly, the Palestinian officials and entities that are concern about OSH issues; secondly, to the literature review which will be enriched with significant OSH data and information about a developing country that does not have such published information; thirdly, this study will definitely help in shortening the research's time and road for other researchers whose researches will be related to OSH in Palestine in general, and the targeted manufacturing industrial sectors in particular.

Finally, and most importantly, this study will help the OSH officials and stakeholders in realizing the current OSH status, determining their weaknesses and strengths, and understanding the importance of creating an OSH system so as to help them in enhancing the current OSH reality. Besides the theoretical and applied contribution of this research, this detailed study will definitely ring the bell to all OSH stakeholders to admit and confess the existence of the huge OSH dilemma.

1.12 Thesis Structure

The thesis is divided into six chapters. The first chapter "*Introduction*" introduces the thesis subject, as well as encompasses the thesis problem, scope, significance, originality, contribution, and the ultimate expected outcome. This is achieved by clarifying the research's objectives, questions, and hypotheses.

The second chapter "*Literature Review*" reviews previous studies, articles, and reports in relative with the OSH problem. It also summarizes international, national, and local figures and statistics for occupational accidents, injuries, and fatalities. Moreover, it discusses some real successful examples regarding reducing occupational losses and enhancing the safety and health of the working environment.

In the third chapter, the "*Methodology*" that adopted in the research is presented. It clarifies the techniques used for data collection, the sampling, and the data analysis. Furthermore, chapter three explains the safety calculations process where the OSHA formulas used in finding the OSH rates in the Palestinian manufacturing sector are presented. It also briefly shows the calculations results.

The fourth chapter "*Results Analysis & Discussion*" presents the findings and results of the quantitative and qualitative data. It illustrates the findings of interviews, questionnaires, as well as the OSH calculations. In addition, it reveals some important correlations between OSH variables. Besides that, this chapter discusses in details the research questions and hypotheses depending on; results, findings, and resulted correlations. The reality of the OSH in the Palestinian manufacturing industries in accordance with safety ingredients and the severity of the industrial sectors that are analyzed in this chapter.

The fifth chapter "*Framework Development*" represents the current OSH status in the Palestinian manufacturing sector in a framework. Then the same

chapter suggests an outstanding OSH framework on the basis of safety pillars and sustainable development.

The last chapter, the sixth chapter "*Conclusions & Recommendations*" summarizes the thesis conclusions, limitations, recommendations, and points out important suggestions for possible future researches.

Chapter Two

Literature Review

Chapter Two

Literature Review

2.1 Chapter Overview

This chapter presents a theoretical and statistical revision related to the Occupational Health and Safety (OSH) problem that derived from the literature. Besides, the chapter highlights the concepts of work-related accidents and diseases, their causes, accompanied with a detailed clarification to the OSH statistical differences locally and globally, both in the industry in general, and in manufacturing in particular. Furthermore, this chapter discusses the concepts of OSH statistics and OSH calculations. Finally, chapter two briefly describes the Palestinian OSH reality through some important figures.

2.2 Background

(Healthy and Safe) work is one of the most valuable assets and basis for individuals, communities and even countries (Onrec.com, 2017). Health and healthy workplace are kind of two terms that some people may consider as excessive social well-being that civilized countries seek to provide to their employees. Whereas the fact is that for workers and employers, they are not. Worldwide, occupational accidents and diseases continue to be the leading causes of work-related deaths. Annually, a substantial amount of people dies or become disabled due to occupational accidents or diseases (Fidanc & Ozturk, 2015). According to the U.S. Bureau of Labor Statistics (BLS) and

the ILO websites, a worker dies from a work-related accident or disease, as well as 153 workers are exposed to work accidents every 15 seconds (Low et al., 2017).

Every day, 6,300 people die because of different occupational accidents or diseases. More than 2.3 million deaths with 317 million accidents occur on the job annually, 438,000 workers die because of toxic materials and 10.0% of the skin cancers in the world (Fidanc & Ozturk, 2015). A more recent statistics showed that globally occupational diseases like cancers (666,000 deaths) and cardiovascular diseases (827,000 deaths) kill much more workers than occupational accidents do (353,000 deaths) (Takala, et al., 2017).

Away from the value of human lives, the workplace accidents highly sound economic sense. Worldwide, there are 313 million nonfatal occupational injuries each year requiring at least 4 days of absence from work (Rommel et al., 2016). Businesses spend \$170 billion a year on costs associated with occupational injuries and illnesses (Osha.gov, 2017). About 4.0% of the world's Gross Domestic Product (GDP) or about \$2.8 trillion, is swallowed up by the direct and indirect costs of occupational accidents and diseases. That adds up to about \$1.3 trillion a year (ILO, 2013). This percentage may vary widely among countries depending on many different factors. For example, UK estimates the financial total annual costs of work-related injuries to 14 billion Euros, about 0.8 % of the GDP (HSE, 2016). Occupational accidents and injuries cost American employers more than \$53 billion a year (DOL, 2016).

On the near side, and as mentioned above, many of the world occupational accidents and diseases are never notified which understate the problem. However, the magnitude of insufficient safety and health practices in workplaces becomes clear, as well as reducing work-related accidents and illnesses becomes a necessity, not only in financial terms but also to humanity. OSH is a human and worker right that cannot be neglected or denied, and the need for preventing occupational accidents and diseases is now both obvious and urgent (OSHC, 2006). After the industrial revolution and the technological advancement in various business sectors, the greatest concern of the industrialists was to achieve the greatest possible profit from this great development. They used to look to the OSH issues as unnecessary, expensive accessories.

The enormous human losses and the consequent economic ones could be substantial for any industry in the world. The workers' fear for their lives and their lack of confidence in work and employers often led to a total collapse of many establishments, especially the Small and Medium Enterprises (SMEs). The difficult to impossible compensation of some experts that lost due to occupational accidents or diseases, has many times damaged the reputation and fame of many large enterprises (Baig & Narahari, 2011).

All this and much more have awakened the institutional, national, and international responsibilities towards the OSH, so as to urgently address it as an extreme priority for their success, productivity, and sustainability.

2.3 Occupational Safety and Health (OSH)

In order to understand the main mean and purpose for OSH, and to illustrate this problem, larger explanations for special terms will be shed in the next sub-section.

2.3.1 Occupational Accidents and Diseases

In order to understand and absorb the concept of OSH, it is typically essential to address the most critical sources of risks that threaten the safety and health of individuals in the workplace, (Occupational accidents and Occupational diseases). However, and prior to talking about occupational accidents, their causes and consequences, two basic misunderstood terms must be clarified and distinguished. Recently, occupational accidents have become a common use than the word (incident) or vice versa in most OSH articles. Despite the semblance between the two words, the fact is that there is a big and clear difference in the meaning and content between both of them. The terms may appear to be interchangeable, nevertheless, they are not.

The Health and Safety Executives (HSE) define an incident as: "any situation that unexpectedly arises in the workplace which has the potential to cause injury, damage or harm, caused by a miss or undesirable circumstances". While an accident is "an unintentional, out of control bad event caused by error or by chance that leads to some damage or injury" (HSE, 2004).

Referring to their definitions, it is clear that accident is a more specified word that usually expresses almost any negative thing that happens by chance, without any prior intention.

On the contrary, an incident, which could be either positive or negative, is much more general and can be used to talk about any single event. In other words, every accident can be an incident. However, not all incidents can be termed as an accident (Ferrante, 2011). Hämäläinen et al., 2009 who defined occupational accidents as; any occurring event arises during the working day leading to fatal or non-fatal injury could better illustrate its scientific and practical concept. Occupational accidents divided into two parts; the first is the fatal occupational accidents, which ends the lives of individuals exposed to the accident. The other is the non-fatal occupational accidents, which end with at least four out of workdays. Lifting, hazardous materials, workplace violence, and fall are common causes of occupational accidents. Another important concept that is worth discussing is occupational diseases or illnesses. In spite of the fact that the concept of occupational diseases is largely different from occupational accidents by nature, timing, and consequences, occupational illnesses as a concept are much wider. It includes work related skin cancers, musculoskeletal disorders, and psychosocial problems. Besides all diseases that have been shown to have an association with work (Hämäläinen, 2007).

While occupational accidents may occur fast in a moment and without pre-notifying warning, occupational diseases, on the other hand, need a long time to show their symptoms or their final impacts. Scientifically, an occupational disease can be defined as: "a chronic ailment or illness occurs as a result of a prolonged exposure to work hazards and work activities" (Burton, 2015). These illnesses can be caused by poor air quality, exposure to chemicals, lack of sanitation and a number of other hazards.

Despite their different nature and causes, both occupational accidents, as well as the occupational diseases, may meet at one inevitable end, which is Death.

2.3.2 OSH Statistics and Rates

There is a real agreement around the world that the OSH greatly suffers in the developing countries. The OSH status of SMEs there, the Underreporting of occupational accidents, the lack of documents, and the credibility absence, are definitely the main reasons in such dilemma (Hamalainen et al.,2006). The other dark side of the OSH dilemma is the institutional side of occupational safety. Therefore, the inefficiency of OSH regulations, the poor enforcement of OSH laws, as well as the continuous occurrences of occupational accidents make it much more difficult and surely much more challenging to develop OSH strategies that could help in improving the OSH (Umeokafor, et al., 2014).

Understanding the status quo of OSH in the developing countries in general, and in Palestine and the Palestinian industrial sectors, in particular, is almost impossible without a deep reading, and a comprehensive study for these areas and their OSH statistics using the US-OSHA and EU-OSHA safety formulas. In other words, it is impossible to realize and perceive the OSH reality and specifically the Palestinian industrial OSH reality without defining it in relation with terms like; incident rates, fatality rate, occupational diseases rate, and so on.

Up to the researcher's knowledge, there are no previous studies or statistics calculations related to OSH for the Palestinian industrial sectors in the open

literature. Hence, the following sections use the OSH statistical and figures obtained by -the researcher- on the Palestinian industrial sector to explore the OSH status. Generally speaking, finding and calculating the OSH statistics in each country and for each industry are as important as adopting the OSH regulations and provisions. Moreover, these statistics are already included in the provision of the Labor Statistics Convention (No. 160) and Recommendation (No. 170), 1985 (Laurie, 1998). Such statistics are included so as to encourage countries to publish their figures alongside their recommendations to lower occupational accidents. So, OSH statistics are somehow part of the LL. The significance of OSH calculations lies in the fact that these statistics evidently reflect the requirements needed to improve the OSH. They directly determine all institutional gaps related to updating laws, regulations, and enforcement of safety rules. Hence, the OSH statistics are very important in the decision-making process as they can be considered as the best dependable tool to set strategies and goals including monitoring performances.

No denying that, the OSH statistics are the effective reliable tool that national and international comparisons could be built around them (WSH, 2014). Based on all of that, safety calculations are of significant values and importance as they give an overall picture of the working conditions with regard to health and safety at work.

2.3.2.1 OSH Calculations Formula

There are different formulas used around the world to calculate and compute the OSH statistics based on; the country, the national or international safety

regulations, and association that the country follows (Crowl & Louvar, 2002). Saying this, the most popular and used formulas are those developed by OSHA and ILO/HSE (Osha.europa.eu, 2018). In Europe and ME countries, ILO/HSE or as known the EU-OSHA is "the leader promoting healthy and safe workplaces in Europe" as stated in its vision. In the American continent, OSHA or US-OSHA aims to assure safe and healthful working conditions for all people (Crowl and Louvar, 2002; Ellis, 2017).

2.3.2.1.1 (US VS EU) OSHA

US-OSHA became a law by the end of 1970. It controls all private and governmental sectors in 50 US states and territories, covers both employers as well as employees. US-OSHA strategies according to Ellis, 2017 are "strong, fair, and effective enforcement, education and compliance assistance, partnerships and alliances with local governments and private sector".

While US-OSHA has as power as an authoritative agency to set and enforce law, EU-OSHA which was founded in 1994 and aims only to gather, analyze, and share the OSH information to their clients all over the world, works like a provider for empowerment and education to assure successful safety programs, but not enforcement which comes on a country-by-country basis. The goals of both associations are very close despite their different strategies. Their terms and formulas also are somehow neither complicated nor substantially different (Ellis, 2017). The main fundamental difference between both formulas is that the US-OSHA rates are calculated on the basis of 100 employees who work 2000 hours per year, for a sum of 200,000

working hours through which they exposed to risk. On the other hand, the EU-OSHA formulas rates are calculated on the basis of 100,000 working exposed to risk employees while FAR rates are based on the number of fatalities for 1000 employees working their entire life or about 50 years. This ends up with a (10^8) working hours through which employees exposed to risk (Crowl & Louvar, 2002).

2.3.3 OSH Reality in Developing Countries

When reading the international and national published figures and statistics of OSH for the first time, it may be noticed the decline of these figures for the benefit of developing countries over the developed ones, although the reality has nothing to do with that. Indeed, these figures are misleading ones, as the real data seems to be different and very large. While the developed countries are working to cooperate internationally and sign new agreements in the field of health and occupational safety in order to achieve zero accident policy, most developing countries, especially in the Arab region, have not signed any of these agreements yet.

Developing countries, which characterized in high growth rates, large population density, low cost low knowledge workers, and poor awareness of OSH necessity, bear more than 80.0% of the global burden of occupational disease and injury, and suffer from many various problems and difficulties that hinder the development of the OSH and the Industrial Safety (IS) fields. Table (2-1) summarizes some of the obstacles that negatively affect the OSH reality in the developing countries and ME.

Table (2-1): Some obstacles that hinder the development of OSH in the developing countries and ME.

The Obstacle	Description	Reference
Political	- Transferring dangerous industries from developed countries to developing countries.	(Takala, et al., 2017)
Governmental	<ul style="list-style-type: none"> - Delayed Ratification of ILO conventions of OSH. - Lack of comprehensive and detailed OSH provisions in domestic legislation. - The absence of national OSH policies and programs. - Weak enforcement of OSH regulations. - Delayed update of OSH regulations in line with the development of industry and technology. - A serious gap in OSH mechanisms and performance. - The weakness of the supervisory role of those concerned with OSH. - Credibility. 	(Alli, 2008).
Economic	- Compensation Coverage	
Institutional	<ul style="list-style-type: none"> - Weak commitment of the administrative departments to OSH. - Inadequate reporting to occupational accidents. - Lack of comprehensive and accurate data of the occupational injuries and deaths. - Failure to involve tripartite health and safety advisory bodies in decision-making on related issues. 	
Organizational	<ul style="list-style-type: none"> - Lack of local OSH experience. - The inefficiency of training in this aspect. - Building Capacity. - Organization Size. - The low number of experts in the OSH field. - Discrete direct supervision on workers. 	(Habib, 2007; Alli, 2008; Al Fadhooley, 2017)
Ideological	<ul style="list-style-type: none"> - Adoption of new technologies, systems, or materials and ignorance of their effects on suitability and on producing new possible hazards. - Lack of safety measures and negligence by the individual during work. - Lack of OSH knowledge and training. 	(Habib, 2007; Alli, 2008; Awadh, 2017)

Other realistic reasons for the obvious significant differences in the OSH statistics of the different industrial sectors between the developed and the

developing countries could be mainly summarized into two separate points; the first is the Size of the industrial establishments, whilst the second is Credibility.

❖ Regarding the establishments' **Size**

The developing countries appear currently to experience rapid globalization, modernization, and urbanization, particularly in Asia, occupational accidents and work-related illnesses, are on the rise. Researchers suggested that the extensive industrialization in developing countries contributed to the increase in occupational accidents especially in SMEs; companies employing (10-49) people or even less than 9 (Low et al., 2017).

On the contrary, large industry sectors that have higher jurisdiction and stronger enforcement by OSHA do enjoy a safer work environment leading to much stronger decreases in workplace injuries and fatalities according to BLS. SMEs are those types of sectors where OSHA does not really make its presence felt. The hazardous working environment, the adverse working conditions, and the lack of practical interventions and policies in these enterprises have a significant impact on the likelihood of an increased accident rate (Berryman, 2017).

As the majority of companies particularly in the developing countries are SMEs, it is reasonably expected to witness higher estimated accidents rates.

❖ Respecting **Credibility**

The main significant difference between the published figures in the developed countries and those of developing countries is the Credibility. In most developing countries, the documentation process of accidents in the workplace has been largely absent, which reduces the credibility of the figures and ratios mentioned in researches somehow (Hamalainen et al., 2006).

Figures of accidents in developing countries are not based on proper accident recording and notification systems. Global figures for occupational accidents are missing. Global estimates by ILO showed that there is a real great underestimation in figures of occupational fatal and non-fatal accidents in developing countries as occupational problems are bigger than earlier believed. The process of obtaining accurate statistics and figures regarding the number of occupational accidents or fatalities in the ME is as difficult as almost impossible.

Most of the ME countries do not have any valid record system that specialized in documenting data and facts (Habib, 2007). The majority also do not even publish any precise or forecasted figures, exacerbating the problem rather than helping to effectively solve it. A US research study showed that between (33.0%-69.0%) of all-occupational injuries were missed of the reported injuries (Leigh et al., 2004), ensuring again the reason for the huge remarkable difference in credibility compared to developed countries.

Table (2-2) shows the fatal rates against the reporting percentages in the developed and developing countries.

Table (2-2): Fatality Rates versus reporting percentages in Developed and Developing Areas (Hamalainen et al., 2006; Mekkodathil et al., 2016).

Region	Fatality Rate	Reporting Percentage
UK	1.4	43.0%
Denmark	1.6	46.0%
Sweden	1.6	52.0%
India & China	10.5	0.0% India, 1.0% China
Asia & Islands	21.5	0.0% Almost All, 7.0% Malaysia
Middle East	20.0	0.9%
Sub-Sahara Africa	21.0	0.0%
Latin America & Caribbean	24.9	7.6%

Figures and statistics of occupational diseases are not less serious than those of occupational accidents are. On the contrary, it has been explained previously that and according to global statistics, the number of deaths resulting from occupational diseases is much more compared to those resulting from occupational accidents. This fact stands out a greater riskier problem threatening the lives of individuals.

Table (2-3) highlights the huge difference in the global figures between fatal occupational illnesses and fatal occupational accidents.

Table (2-3): Global estimates of the fatal occupational illnesses and fatal occupational accidents (ILO, 2014).

Region	Estimates of Fatal Occupational Illnesses	Estimates of Fatal Occupational Accidents
HIGH	387,482	11,396
AFRO	186,549	59,301
AMRO	111,749	18,433
EMRO	105,692	19,229
EURO	210,216	14,609
SEARO	494,474	114,732
WPRO	483,100	115,069
All over the World	1,979,262	352,769

Where: **HIGH:** High income countries, **AFRO:** Low- and middle-income countries of the African Region, **AMRO:** Low- and middle-income countries of the Americas, **EMRO:** Low- and middle-income countries of the Eastern Mediterranean Region, **EURO:** Low- and middle-income countries of the European Region, **SEARO:** Low- and middle-income countries of the South-East Asia Region, **WPRO:** Low- and middle-income countries of the Western Pacific Region.

As for the most common occupational diseases causing death around the world, Table (2-4) numerically illustrates the number of deaths resulting from occupational diseases according to their most serious hazardous substances.

Table (2-4): Estimated number of deaths attributed to the most hazardous substances arranged in descending order (ILO, 2014).

Occupational Diseases	Total Number of Deaths
Chronic obstructive pulmonary disease	374,128
Cancers	361,109
Cardiovascular diseases	75,470
Asthma	61,911
Genitourinary diseases	10,186
Other respiratory diseases	4,977
Neuropsychiatric conditions	1,112

2.4 OSH and Dangerous Industries

In spite of the great efforts of the Occupational Safety and Health Administration (OSHA) standards and ILO's regulations in different work fields, including; construction, general industry, maritime and agriculture standards in preventing countless work-related injuries, illnesses, and deaths, as well as protected workers from a wide range of serious hazards. Far, too many preventable injuries and fatalities continue to occur (Cioni and Savioli, 2015; Kim et al., 2016; Cdc.gov, 2017). According to the last U.S OSHA statistics, the census of fatal occupational injuries increased from (4,693) in 2011 to (4,836) in 2015. While the major rise in fatal work injuries was in transportation, the private agriculture, forestry, fishing, and hunting sector had the highest fatal work injury rate, and private construction had the highest count of fatal injuries as shown in Figure (2.1).

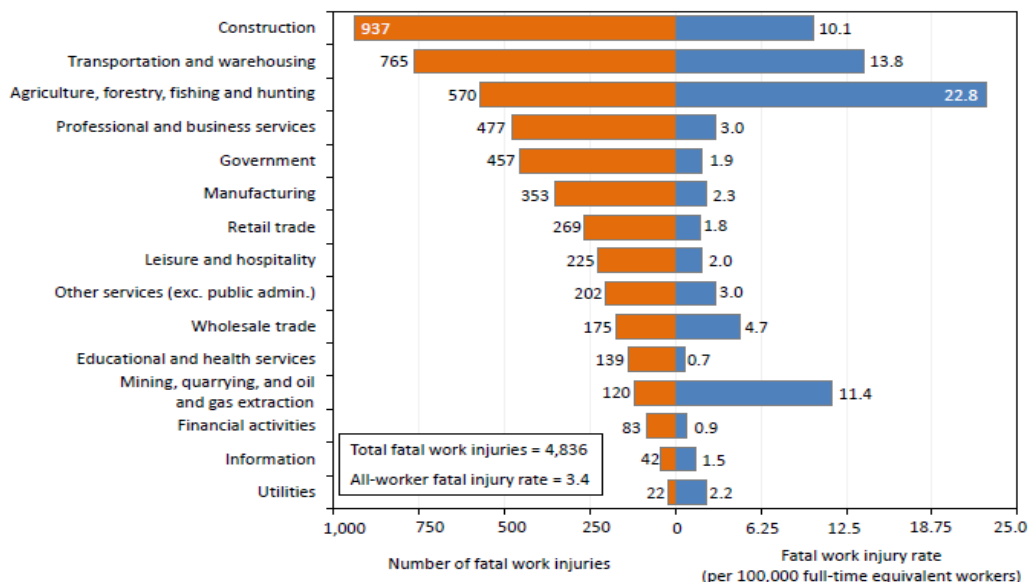


Figure (2.1): Numbers and rates of fatal work injuries by industry sector, 2015. **Source:** U.S. Bureau of Labor Statistics, Current Population Survey, Census of Fatal Occupational Injuries, 2016.

The previous figure can effectively explain why the construction industry is classified as one of the deadliest in the US. However, the same look more dangerous when highlighted in UK, which is ranked as one of the safest regions to work in Europe ahead of Germany, Spain, France, and Italy for preventing fatal workplace accidents (HSE News, 2017).

Construction is not the only dangerous industry in this world, nor is its danger exclusive to the developed countries. Quite the opposite, many developing countries that have a much like reality like ME and the Arab world in the OSH field (Zekri, 2013), almost rely on the construction industry as an economic pillar, such figures can be easily found with much higher rates than even probably may appear more serious for those interested in the OSH issues. One of the most problematic examples regarding occupational accidents in the world in general and in the ME, in particular, is the construction sector in the occupied territories of Palestine or the so-called (Israel). Construction industries there are classified as one of the most dangerous industries around the world. The rate of workers' deaths is doubled that of the European Union (EU) average, which makes it one of the highest in the west and east according to the latest report of The National Insurance Institute (NII) and the Ministry of Economy which admitted paying over 4.5 billion New Israeli Shekel (NIS) in 2015 for workers' compensation due to injury, amounting to over 2 million workdays and at the expense of billions to the national economy (Staff, 2016). Perhaps one of the most striking things is that most of those killed and wounded were never Israeli, but Palestinian and foreign workers, reinforcing doubts about

employers' compliance with OSH requirements for their employees according to their nationalities and the nature of their contracts.

The problem does not end there; the worse is that the number of deaths in this sector is increasing annually. With a fatality rate of 13.2 which exceeds the deaths rates in USA and EU in full. The total number of fatalities that resulted from occupational accidents in 2015 was estimated to be 54 deaths; where 34 of them occurred in the construction sector. Another rise in occupational fatalities recorded in 2016 with 62 deaths; where by only the end of the first quarter, 15 of them were in the construction sector also. By the beginning of 2017 and the end of July, 23 of the same year, additional deaths were documented in the same sector (Staff, 2016; Eldar, 2017). Away from Construction, the ME and Africa have the highest road traffic fatality rate in the world leading to annual loss of 1.2 million people which can not in any way be classified as an acceptable or a reasonable loss (Lboro.ac.uk, 2017).

In the same vein, these critical figures can be found equally true and serious but in totally different industries, exactly in **Manufacturing**.

While officials are investigating and documenting an accident in the construction sector, many manufacturing factory workers are taken to hospitals in serious conditions after industrial accidents. Of course, not to mention the number of occupational diseases resulted from manufacturing activities that pose a real danger to both workers and the public as well. In short, the determination of the seriousness of the industry primarily depends on its importance to the country, its economic impact, the country's economic status, and finally its commitment to the enforcement of the OSH laws and

regulations. Table (2-5) presents some dangerous industries regarding their located countries and the number of fatalities in them.

Table (2-5): Numbers and Rates of reported worker fatalities per Industry and Region between the years (2014-2016).

Region	Industry	Fatality Rate	Reference
USA	Construction	10.1	(Bls.gov, 2017)
UK	Construction	1.4	(HSE, 2017)
Australia	Agriculture	27.0	(SWA, 2015)
Ireland	Agriculture	23.9	(HSA, 2018)
Singapore	Construction	2.2	(OSHD, 2014)
Malaysia	Construction	4.7	(Idris, 2017)
Turkey	Construction	30.8	(Bilir, 2016)
KSA	Construction	7.9	(Zekri, 2013),
Egypt	Manufacturing	7.0	(Shareki, 2017)

2.5 OSH and Manufacturing Industries

2.5.1 Manufacturing in the Developed Countries

An accident is an unplanned event, which may occur at any moment and in a completely sudden manner, causing injuries, out of workdays, disabilities, or even death (Dhanasekar et al., 2014). The manufacturing sector is almost the most dangerous sector in which such accidents may continue to occur. How it is not, and the continuous technological and scientific development in this vital sector contributes in one way or another in the rising numbers of serious accidents. According to Moatari-Kazerouni et al., 2014; Dhanasekar et al., 2014; Kim et al., 2016, that despite all the safety practices and preventive health programs adopted to reduce risks in this sector, as well as

to provide the adequate OSH for its all working individuals, especially in the developed countries, the nature of manufacturing systems and their dependence on machinery, equipment, complex materials, hazardous substances, as well as the need for large numbers and capacities of labors, promote the probability of the continuous creation of daily innovative risks, so as to jeopardize the employees' lives, health and safety.

Globally, about 4.5% of the workers employed in manufacturing businesses faced accidents at work in a 12-month period causing harmful economic and human losses (Dhanasekar et al., 2014). An accident in a manufacturing facility can quickly change a worker's life, even in the most developed countries like USA or EU. In US North Carolina, an intense study clarified that workers in manufacturing and production include packaging food, clothing, pressing metals, forging steel, processing meat, as well as on particular, workers in Finnish Furniture Industry which is the leading industry there, face serious environmental hazards (Aaltonen, 1996; Hardison and Cochran, 2017).

Undoubtedly, such hazards are the primer reasons for occupational accidents and diseases. Nevertheless, occupational accidents and diseases do not result from physical and environmental hazards only, many accidents and diseases may be a result of psychological and neurological factors experienced by the worker in the workplace. Fatigue, discomfort, stress, routine, and tasks' repetition have made the US meatpacking industry counts for a large percentage of workers' compensation costs (Kim, 2016).

One of the most important proven evidence on the seriousness of the OSH issues is the global documented statistics, which and despite its distancing

from credibility, it summarizes the difficult reality of the working lives of workers and the workplace conditions. A recent OSHA report that summarized the workplace accidents in 26 high safety standard states showed that, there were 10,388 severe injuries resulted in 7,636 hospitalizations and 2,644 amputations. 57.0% of all amputations and 26.0% of hospitalizations were results of manufacturing accidents (Gillespie, 2016). Such large percentages reflect the serious reality of the OSH in manufacturing all over the world. These logical findings were almost confirmed through another similar study that was conducted in the opposite continent, in Europe, when Statistics Netherlands (CBS) and the Netherlands Organization for Applied Scientific Research (TNO) showed that manufacturing workers have the highest work-related accidents rates and ensuring absence. These rates were calculated for 10 different manufacturing sectors, and they showed seriousness in; metal industries with the highest accidents rate 5.1, 3.9 for food processing industries, 3.2 for operators' vehicles and mobile machines, and 2.6 for operator production machinery (Cbs.nl, 2016).

Regarding the manufacturing sector, chemical and pharmaceutical industries had the highest occupational illnesses percentage (38.0%). Whilst 15.0% of all occupational illnesses were due to food and drink industries, 14.0% of them caused by metallic industries, and 21.0% were results of other non-metallic industries (HSE, 2015). Despite the fact that companies are primarily seeking to eliminate occupational accidents, especially those that cause chronic illness or death, and in spite of the fact that some have already succeeded in achieving that goal, the fluctuation of statistics between

declining and rising gives a clear indication of how difficult the OSH issue is for the multiplicity of interrelated and overlapped factors (Çolak & Palaz, 2017). Also, an important alarming sign should be mentioned that the reduction in the number of accidents has never meant a reduction in the number of deaths.

The adverse effects that accompanied the industrial revolution imposed many economic, political, social, and health damages. Furthermore, these effects vary from continent to another, as from state to state. In more a specific expression, they are completely different between civilized and developing countries. The establishment of OSH institutions and the development of OSH regulations, standards, and procedures are the first and most important steps in the prediction, prevention, and mitigation of painful effects of the industrial growth (Arasto et al., 2015).

2.5.2 Manufacturing in the Developing Countries and ME

While the developed countries were doing well in the last decades regarding increasing the importance of the OSH issues, as well as reducing occupational accidents through reducing the number of workers working in hazardous environments and industries, hazardous and labor intensive workplaces, such as those in manufacturing have taken place in other locations, in particular, in Asia (Takala, et al., 2017).

Nowadays about two third of all workers in the advanced world are working in services, whereas, half of all labor force in developing countries, and especially in the ME is employed in manufacturing. This shift towards automation, mechanisms, and processing has already raised the occurrence's

probabilities of occupational accidents and diseases in developing countries where most of such countries suffer from bad OSH services at the national, local, and facility levels (Zaki et al., 2012).

Recently, the countries that exploited the industrialization to revive their markets, reduce unemployment, and build a solid economic base among the global economy, have given the OSH issues additional interests. The enormous impact of OSH on the economy in general, and on lives, deaths, absence, and productivity in specific, forced the authorities to put such necessary case in consideration, or more, to make it a priority (Çolak & Palaz, 2017). However, their efforts seem to be inadequate to ensure the OSH.

The Social Security Corporation in Jordan reported 13,345 work-related accidents in 2016, in an average of an accident every 39 minutes and a work-related death every two days. The manufacturing sector accounted for the highest number of injuries with 3,784 injuries, 34.2% of all occupational injuries (Al Fadhooley, 2017). In the same year, the annual report of the Saudi General Organization for Social Insurance (GOSI) recorded 8,589 occupational injuries in manufacturing industries, accounting for 16.1% of total occupational injuries (GOSI, 2016).

On the same context and according to the Central Agency for Public Mobilization and Statistics (CAPMAS), the occupational accidents in Egypt reached 16,902 accidents in 2015; about 10,630 of them were due to manufacturing activities. The Egyptian CAPMAS pointed out that Egypt suffers annual losses of around 1.6 billion Egyptian Pounds (EP) due to

occupational accidents. In addition, there are approximately 2 million factories that are not subjected to OSH standards, and violate IS conditions leading to 20,000 fires a year (Awadh, 2017).

As in these countries, Turkey also suffers a lot from occupational accidents. Every year, nearly 1,150 deaths and 1,900 injuries occurred in different workplaces. Most of these injuries lead to permanent disabilities. Analysis showed that 46,4% of the accidents and 41,1% of the deaths in Turkey occurred only in manufacturing, in particular, in mining, metal, and construction sectors (Ceylan, 2012).

The OSH accidents have never been confined to tough, hard, and harsh manufacturing industries. On the contrary, some of the worst-ever industrial accidents may occur in completely different industrial sectors. For instance, the apparel, or readymade garment manufacturing in Bangladesh only in the last 4 years has been plagued by several catastrophic accidents and caused more than 7,215 worker injuries and 1,300 worker deaths. Given the figures and statistics related to OSH in developing countries and the difficulty of obtaining them, gives a clear indication in advance of those in the Arab region and the ME countries. The process of obtaining accurate statistics and figures regarding the number of occupational accidents or fatalities in the ME is as difficult as almost impossible. Most of the ME countries do not have any valid, and updated record system that specialized in documenting data and facts (Habib, 2007).

Therefore, Table (2-6) shows the occupational accidents and fatality rates in general, in some of these countries.

Table (2-6): Occupational Fatality rates per 100,000 workers in the ME region (Hamalainen et al., 2006).

Country	Accidents Rate	Estimated number of Fatal Accidents	Fatality Rate
KSA	11,948	1,096	15.7
UAE	12,149	283	15.9
Egypt	18,317	3,884	24.0
Jordan	11,881	179	15.6
Turkey	14,567	4,122	19.1
Morocco	36,492	1,993	47.8
Israel	11,142	257	14.6

Nevertheless, Hamalainen et al., 2006 argue that the manufacturing fatality rate in the ME was 21.2 compared to other Asia Islands, India, and China, which were 21.0, 13.4, and 26.4 respectively.

2.6 OSH in Palestinian Manufacturing Industries

Over more than 40 years, specifically until 1994, the Palestinian economy was subjected to the laws of the Israeli occupation that controlled the sovereignty of most of the Palestinian areas. During these years, the occupation authorities have paid little attention to the issues of occupational safety and health, whether in Palestinian installations or even concerning Palestinian workers in the 48 areas. With the transfer of the sovereignty of the territories to the Palestinian Authority, it has become its primary responsibility to protect workers, ensure its duties towards them, and admit their rights (Jaber et al., 2008).

In 2000, the Palestinian Authority was able to issue the first Palestinian labor law (PLL), followed by many other legislations related to the safety of the Palestinian establishments, the licensing of crafts and industries, the law of crafts and industries, and the law on the treatment of harmful health in the

workplace. In spite of the Palestinian Authority's approval of the MOL as the main entity in the application of the Labor Law (LL) and its legislation to all Palestinian establishments and their cadres, the emergence of governmental and other non-governmental organizations concerned with OSH, Labor protection, trade unions, and others continued (Jaber et al., 2008; Zaghlool, 2008).

Four years later, MOL issued the Public Health Law (PHL), which deals with occupational health, monitors the application of health conditions in establishments, and identifies risks that negatively affect public health. This continued attention to safety and health led to launching the Consumer Protection Act (CPA) in 2005, which guarantees the rights of the consumer to ensure that he is not exposed to any health risks or economic losses. Finally, the Industrial Law (IL) of 2011, which compels industrialists to conform to specifications, control products and stocks, apply the terms of industrial licensing, industrial safety, health and safety, and comply with environmental conditions.

According to the International Labor Office (ILO) ILO, 2017, it was expected that the MOL and the social partners would be committed to advance reform for the labor law during 2017. A number of technical tripartite committees have been established to deal with key aspects of the reform, such as labor conditions, occupational safety and health, and labor inspection. Efforts are made with ILO support to bring the draft law into full compliance with relevant international labor standards. Furthermore, the MOL could finally approve the minimum wages in Palestine to stand at NIS 1,450 (\$375) per month after a five-year delay (Abu Amer, 2017). From

2016, the Palestinian labor inspection services (PLIS) have progressed, increasing the number of inspectors from 42 in 2016 to 57 in 2017. In addition to developing the staff, a new Information System should have been integrated into the Labor Market Information System (LMIS) of MOL. The Cabinet approved a new national policy and program for OSH in 2016, but without any financial commitments yet.

Despite the existence of some Palestinian regulations and legislations to prevent occupational injuries and accidents, and to protect and promote health at the workplace, still, a large number of accidents occur every single day leading seriously to social and economic problems. Comparing the statistics related to the Basic Health and Safety Requirements (BHSR) obtained from several studies between the years (2004-2008), it was found that the establishments' commitment to laws is much lower than expected. Additionally, there is an obvious gap in statistics in the years 2005, 2006 due to employment strike and the political changes in the Gaza Strip (Jaber et al., 2008; Zaghlool, 2008).

Table (2-7) declares the establishments' commitment to Labor Laws (LLs) through the estimated percentage of *the absence* of the (BHSR) according to the survey of working conditions conducted by the Palestinian Central Bureau of Statistics in 2004, and Democracy Center for Workers' Rights study in 2008.

Table (2-7): The estimated percentages of the absence of the Basic Health and Safety Requirements (BHSR) according to Jaber et al., 2008; Zaghlool, 2008.

BHSR	2004	2008
Fire extinguishing means	30.5%	32.0%
First aid tools	72.1%	25.0%
Emergency exits	60.5%	44.0%
Awareness and guidance	16.3%	62.0%
Periodic examinations	-	90.0%
Reporting accidents	-	63.0%
Workers insurance	30.0%	42.0%

Note: There are no clear statistics for both (Periodic medical examinations and Reporting accidents) in 2004. However, these percentages tend to be very high in 2008 eight years after the law enactment.

Such percentages play a key role as an indicator of the reality of OSH in Palestine. Failure to comply with the most basic safety requirements is a major and dangerous indication of the continuation of accidents, injuries, and possibly deaths. This probability was confirmed in the recent National Description of the Occupational Safety and health (NOSHC) that relates to the OSH System in Palestine (NOSHC, 2015). PLL No. 7 of 2000 is the first Palestinian legislation issued by the Palestinian Legislative Authority, which laid down the rules of occupational injury and occupational diseases, approved the compensation act for those injured and affected by work-related accidents, and determined the scope of liability for both employers and insurance companies.

The PLL is also the founder of the Labor Inspectorate as the first supervisory body in the MOL that monitors the commitment of employers to the law's provisions, in particular, the rules of OSH and all related regulations. The

ILO is the primary reference to the PLL for the selection of laws and the adoption of labor rules. However, as mentioned earlier in the thesis problem (Chapter 1, Sec. 1.3), that in spite of the PLL's adoption of some OSH provisions, it still lacks many other important and vital ones. This fact shows why the occupational injuries and diseases represent a challenge for the Palestinian manufacturing sector in particular, that dominates the total occupational injuries and diseases with annual growth (Atturk & Abu-Arra, 2014).

The figures of occupational injuries and illnesses that documented by PLL show to a certain extent; the danger surrounding the various Palestinian industries and their workers, and stress once again that manufacturing is the greatest threat to these workers. The recent statistics regarding injuries in the workplace of (MOL) reports indicated a clear fluctuation in the number of injuries between the years, 2009 to 2017.

While discussing the MOL annual reports with the director of occupational safety and health department in the MOL, it was found that the total number of documented work-related injuries in 2009 was 444 injuries, of which 270 were in the manufacturing sector. Whereas in 2010, the number of recorded injuries rose to 549 injuries, 234 of them occurred in the manufacturing sector as well. Although the number of injured employees declined in this sector in 2011 to 175 occupational injuries, it clearly returned to rise again in the following year to reach 268 injuries. The following years, namely 2013 and 2014, showed almost consistent increases in the number of occupational accidents in the manufacturing sector to reach 269 and 278 injuries, respectively.

While it was expected that with the tightening of safety measures, the increase in the number of inspectors, and the intensification of field visits to industrial facilities, the number of occupational injuries and deaths would decrease, but this did not happen. In contrast, MOL recorded 664 cases in 2015, 39.0% of them in manufacturing, besides, 682 in 2016, 34.0% of them occurred in the same sector too.

The MOL report of the first half of 2017 reported about 370 notifications about occupational accidents, 135 of them were detected in manufacturing. Such figures and statistics help in giving a clear indication of the seriousness of this sector and the rate and number of occupational injuries and fatalities. These reports did not mention the number of accidents or injuries only, but, the number of deaths, absences due to these injuries, the injuries' severity, the accidents' causes, the location of injury from the body, and even the number of investigated accidents.

Table (2-8) below gives a brief summary to the main OSH statistics between the years (2009-2016) according to MOL.

Note that:

O.A: Occupational Accidents, **M.A:** Manufacturing Accidents, **P.D:** Permanent Disabilities, **O.F:** Occupational Fatalities, **O.D:** Occupational Diseases, **OWD:** Out of Work Days, **H1:** First Half.

Table (2-8): The main OSH statistics between the years (2009-2016) according to MOL.

Year	All O.A	M.A	P.D	O.F	O.D	OWD
2009	444	270	46	9	1	105
2010	549	234	54	14	2	107
2011	399	175	31	13	3	96
2012	715	268	64	12	-	-
2013	752	269	20	20	-	-
2014	650	278	79	12	1	245
2015	664	260	35	21	-	138
2016	682	233	20	15	-	-
2017; H1	369	135	19	3	-	171
TOTAL	5,224	2,122	368	119	7	862

It is important to note that the dash sign (-) appeared in some cells means that no clear statistics related to them have been received in the reports, from one hand. On the other hand, the most prominent issue that deserves to be highlighted here is the absence of any accurate statistics regarding occupational diseases within any of the MOL reports, especially since all the statistics recorded in some years, are provided by the Ministry of Health (MOH), which are also not considered accurate. This shocking fact raises questions about what Atturk and Abu-Arra, 2014 have reported in their recent study regarding work injuries and compensation in Palestine, that there is no mechanism for neither studying nor documenting cases related to occupational diseases.

The mechanism of investigating occupational accidents began to take a more serious course after the increase in accidents' occurrences in the industrial sectors. The MOL started taking many precautionary measures and

immediate sanctions against violators and those who do not comply with the OSH requirements. According to the 2014 report, the MOL investigated 437 accidents resulting in transferring four cases to the Public Prosecutor's Office, a total closure of 6 industrial establishments in return for a partial closure of only 1 establishment. While the number of investigated accidents dropped to 411 in 2015, the number of industrial establishments that have been totally closed increased to 33 compared to 5 partially closed establishments. By investigating 422 occupational accidents in 2016, 39 establishments were completely closed whilst 1 establishment was subjected to automation stop. The H1report of 2017 confirmed the total closure of about 90 industrial establishments until the end of June/2017 for failing to comply with OSH regulations.

The previous statistics are official statistics that were received from the MOL. However, and according to the same reports, a tremendous discrepancy between the occupational accidents statistics that documented by the MOL and those documented by the Palestinian insurance companies (PICs), the General Federation of Palestinian Trade Unions (GFPTU) and the MOH has been noticed. For example, by returning to the 2015 statistics, the number of occupational injuries registered by the PICs was 6,666 injuries, of which 3,500 injuries were in the industrial sector, which is classified by the PICs as a dangerous sector, whilst the GFPTU documented 3,587 work-related injuries, 25 of them were fatal. Close to the MOL statistics (664 injuries); the records of the MOH documented 667 work-related injuries. In the same context, the number of work-related injuries registered by the PICs in 2016 was 5,114 injuries, about 3,000 of them

occurred in the manufacturing sector compared to 682 occupational injuries documented in the MOL reports.

Figure (2.2) shows the number of manufacturing accidents of the total occupational accidents according to MOL and PICs reports (2015/2016).

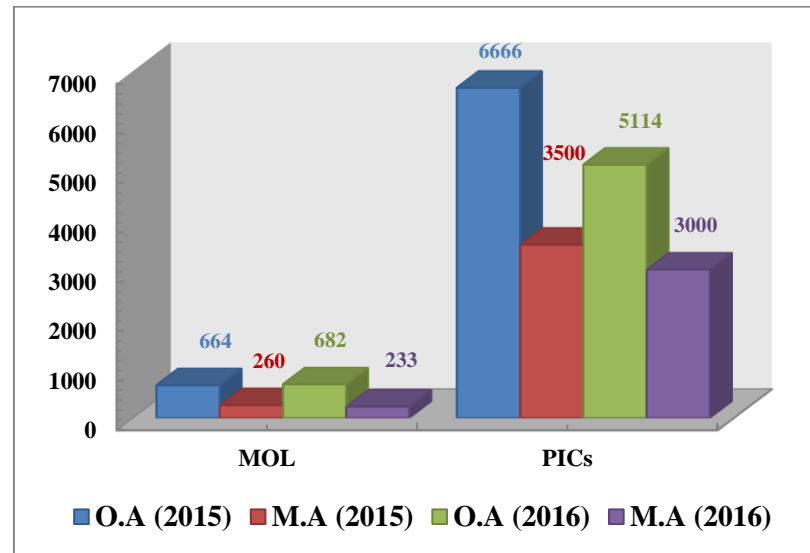


Figure (2.2): Number of manufacturing accidents of the total occupational accidents according to MOL and PICs reports (2015/2016).

In view of the figures that derived from the PICs and the GFPTU and their comparison with those from the Ministries of Health and Labor, it is noticed that there are considerable differences between them, which lights the red alert regarding occupational accidents, especially if it is known that the percentage of insured industrial establishments at the PICs amounts to only 20.0% of all the Palestinian industrial establishments.

Actually, this low percentage of the insured industrial establishments is a double-danger warning. It raises two important questions, which are:

Q1: What is the fate of the rights of non-insured employees that work in non-insured industrial establishments and exposed to occupational accidents?

Q2: How many occupational accidents would be recorded if the percentage of the insured industrial establishments exceeded 50.0%?

The intended idea in the second question was more clarified and confirmed again through NOSHC, which insists that not all the published or documented figures and statistics are 100% realistic and that the actual numbers in Palestine are undoubtedly much larger than reported (NOSHC, 2015). This detailed review of the OSH reality in the manufacturing industries reflects some global and local facts:

Respecting the Global fact:

Both, the minimal decrease in occupational accidents that associated with industrialization in the developed countries and the continuous increase in them in the developing countries suggested additional enhanced attention in OSH issues every day. The huge worldwide competition that built on manufacturing as a basis for the prosperity of all other industrial and service sectors forced many countries to specifically reconsider the manufacturing sector, and to find the best-developed methodologies to secure and improve it (Moatari-Kazerouni et al., 2015).

Respecting the Local fact:

The large numbers of manufacturing accidents shown in the different data sources, as well as the contradiction of deaths statistics in them, make the OSH issues in the manufacturing sectors of the highest priority In Palestine. Furthermore, they urge the need to study the OSH problem and work-related accidents from several other aspects like; non-compliance with laws, lack of emphasis on sanctions, the unavailability of many important laws and regulations, the lack of coordination and cooperation between the concerned parties, and many other aspects, so as to understand their causes and mitigate their dangerous consequences in such a vital sector.

Chapter Three

Thesis Methodology

Chapter Three

Thesis Methodology

3.1 Chapter Overview

Data collection, instrument development process, and the sampling process are the main three processes that fully specify any empirical research. In this chapter, clarifications of the research definition, the research type, and the research methodology are presented. Furthermore, this chapter gives detailed descriptions of the special characteristics of the methodological approach, data collection techniques, thesis scope, as well as the sampling technique and safety calculations and formulas used to achieve the thesis objectives, and investigate the thesis questions and hypothesis.

3.2 Research Type

The first step after identifying the main and sub-objectives of the study is to clarify the best possible methodology to guarantee a successful achievement of these objectives. This thesis aims to develop a conceptual framework that helps in reducing occupational diseases and accidents, as well as promotes the reality of OSH in the Palestinian manufacturing sector from one hand, and to calculate the required OSH statistics depending on the US-OSHA and EU-OSHA formulas in the same sector. In order to achieve these purposes, an exploratory research was conducted. Exploratory Research is a kind of study that is conducted when not enough is known about a certain phenomenon, or when there is a little knowledge base which makes asking

questions about what is happening is a necessity so as to seek new sights and familiarities to assess the phenomenon in a new light (Bhattacharjee, 2012).

3.3 Research Methodology

Research Methodology or strategy is the systematic rules and procedures in which the research based, and against which arguments of data and knowledge are assessed and evaluated. It is the general approach taken to carry out the research (Williams, 2007). According to Creswell, 2012, there are two types of research strategies; qualitative research strategy and the quantitative research strategy. Despite the strong connection between the two types of strategies, each of them represents a different ultimate outcome.

Therefore, choosing one of these two strategies depends merely on the nature of the research problem and questions. In this thesis, a mixed method methodology combines both quantitative and qualitative researches were used in data collection. The quantitative research was in the shape of; information research, and two pre-structured questionnaires that were carried out to collect data about OSH reality in the industrial sector, figures, and statistics. While the qualitative one was in the shape of open interviews that were conducted with the OSH stakeholders so as to explore their opinions, views, clarifications of the OSH state, and how their cooperation could affect them.

3.3.1 Research Methodology Flow Chart

Figure (3.1) illustrates the five-phase methodology flow chart of this research. After defining the research problem, questions, hypotheses, scope, and objectives, a theoretical data collection was carried out through a deep study and review for the literature in phase one.

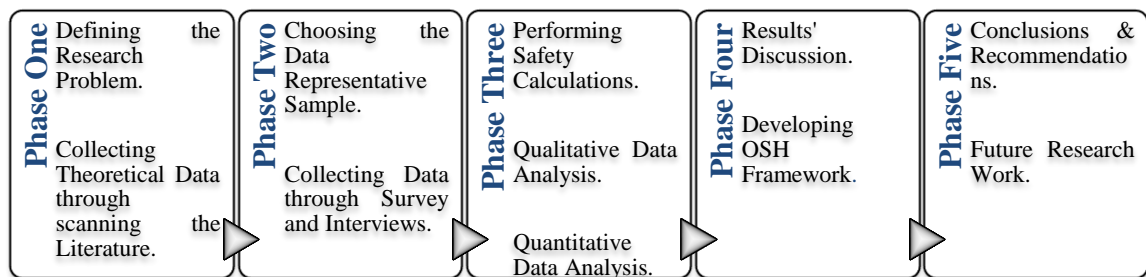


Figure (3.1): Research Methodology Flow Chart.

The second phase consists of data collection after choosing the representative sample. In this phase the data collection was carried out in four different ways;

- Documents, official reports, publications that used to understand the current reality of OSH in the Palestinian industrial sector, the core of this research. At the same time, these documents helped in determining the weakness' points, gaps, as well as the main difficulties that face stakeholders.
- The research information that was gathered alongside the questionnaires from the industrial establishments. This method aimed to calculate the US-OSHA and EU-OSHA OSH rates in the eight Palestinian manufacturing industries using the internationally recognized safety equations and formulas.

■ Meetings and interviews were held with the OSH stakeholders so as to explore their opinions, interpretations about the OSH reality, and also to discuss their cooperative role in enhancing it.

■ Two pre-structured questionnaires were conducted and distributed to assess firstly; the employees' perception of OSH through the (employees' questionnaire). Secondly, to evaluate the working conditions, working environment, and employers' commitment to OSH through the (workplace questionnaire).

The third phase of the thesis is the data analysis phase where according to its type and purpose three sets of data were analyzed:

- a. The qualitative data resulted from the interviews were analyzed using the (Thematic Analysis Approach) so as to create, organize, and describe the ideas and data sets in rich details.
- b. US-OSHA and EU-OSHA formulas were conducted to perform the safety calculations and find safety rates for the industrial sector in Palestine using the quantitative statistics gathered from the Palestinian industrial factories.
- c. A Descriptive Statistical Analysis Method was used to analyze and describe the sample's information using the Statistical Software (SPSS) Program. The purpose of this step is to illustrate the data and to explore the correlation between the questionnaires' variables.

The fourth phase is the framework development phase. Based on literature review, statistical calculations, and the mixed methodology's findings, a conceptual safety and health framework was developed.

The fifth and last phase in the research includes research limitations, conclusions, and recommendations for future work in OSH discipline.

3.4 Research Population and Sample

As mentioned in (Chapter 1, Sec. 1.4.1), the targeted population of this thesis is the Palestinian manufacturing industries in the WB, in particular, the metal, paper, leather, food, chemical, wood, and plastic industries.

According to PSBC, 2016, the number of industrial establishments in Palestine reached 18,056 industrial establishments in 2015, of which 13,218 located in the WB region.

The manufacturing industries contribute to 14.0% of the total Gross Added Value (GAV) of the WB economy compared to the rest economic sectors. The eight sectors control 56.0% of this ratio and 9.5% of the total GAV of all the WB economic sectors. The industrial establishments in the WB are divided between eleven main Palestinian cities which are; (Hebron, Jenin, Tulkarm, Nablus, Ramallah, Bethlehem, Jericho, Qalqilya, Salfeet, Tubas, and Jerusalem). Hebron and Nablus are considered as the beating heart of the Palestinian industry embracing the largest and most vital industrial establishments. In addition, these two cities dominate up to 45.0% of the total number of WB industrial establishments.

3.4.1 Sampling Technique

Referring to the total published numbers regarding the WB manufacturing sector statistics in 2015, the manufacturing industries and their establishments have witnessed an estimated increase of 1.01458% compared to 2012 bringing the total number of establishments in the eight sectors to a total of 8,948 industrial establishments (PCBS, 2013; PSBC, 2016). Several mechanisms for calculating the research sample were used in order to achieve reliable results. Before the application of the sampling equations, specific and intended conditions were set on the manufacturing establishments that have been chosen to study. The sampling process can be detailed in the following detailed points:

- ◆ Multi-Stage Stratified Sampling Technique: The **targeted population** regarding the eight manufacturing sectors is **(8,948)** establishments. These industrial establishments accounted for 9.5% of the WB GAV. Therefore, the initial research sample size was calculated as:

$$N = \mathcal{P}_T \times W_T \quad \text{..... Eq. (3.1)}$$

Where:

N : Initial sample size.

\mathcal{P}_T : Total target population.

W_T : Target population weight of WB GAV.

By applying Eq. (3.1), the required sample size was (850).

◆ Thompson Formula: this formula was applied so as to obtain the minimum required sample size that is needed for; the surveys, statistical analysis, and more, for generalizing the results on population (Saunders et al., 2009; Thompson, 2012).

$$n = \frac{N \times P (1-P)}{\left[(N-1) \times \left(\frac{d^2}{z^2} \right) \right] + P(1-P)} \quad \text{..... Eq. (3.2)}$$

Where:

n : The required sample size.

N : The initial sample size, 850.

d : The percentage error (0.05). {for 95% Confidence Interval}

Z : The upper $\alpha/2$ of the normal distribution (1.96).

P : The proportional probability of population (0.50).

By applying Eq. (3.2), the required sample size was (265).

◆ Calculating the number of establishments in each city depending on the calculated percentage of increase between 2012 and 2015 according to PCBS (1.01245%) using Eq. (3.3)

$$Ec(2015) = Ec(2012) \times 1.01458 \% \quad \text{..... Eq. (3.3)}$$

Where:

Ec : Number of establishments per city.

◆ Estimating the number of establishments required per each industrial sector and per each city, besides the relative weights for each industry and

for each city are illustrated in Table (3-1) and Table (3-2), Eq. (3.4), Eq. (3.5), Eq. (3.6), and Eq. (3.7) were respectively applied:

$$Rwi = Ei / N \quad \text{..... Eq. (3.4)}$$

$$Rwc = Ec / N \quad \text{..... Eq. (3.5)}$$

$$nc = n \times Rwc \quad \text{..... Eq. (3.6)}$$

$$ni = n \times Rwi \quad \text{..... Eq. (3.7)}$$

Where:

Ei: Number of establishments per industry.

Rwi: Relative weight of each industry.

Rwc: Relative weight of each city.

ni: Sample size per industry.

nc: Sample size per city.

◆ The final sample size per each city was chosen after comparing the numbers of establishments per city calculated with the number of best establishments per city obtained from:

- ◆ Palestine Trade Center (Pal Trade).
- ◆ Chambers of Commerce and Industry in (Hebron, Ramallah, Tulkarm, Nablus, Bethlehem).
- ◆ Federation of Palestinian Public Industries (PFI).

378 manufacturing establishments were highly advised by the previous bodies. These establishments mostly consist of the Palestinian top-exporters, the hugest investments in terms of industry, production, facilities, workforce, and innovation. To decide the final sample size per city from the calculated

sample size and the obtained sample, a simple ratio is taken by dividing $265/378 = 0.7$. So, the final sample size per city will be obtained by applying Eq. (3.8):

$$n\mathcal{F} = 0.7 \times n\mathcal{O} \quad \text{..... Eq. (3.8)}$$

Where:

$n\mathcal{O}$: The Obtained sample size per city.

$n\mathcal{F}$: The Final sample size per city.

Note: The selection criteria of the obtained establishments were developed to suit the study in terms of the establishments' size, number of employees, and the establishments' contribution to the GDP.

Table (3-1) below represents the number of manufacturing establishments per industry, and the relative weight for each sector, while Table (3-2) clarifies in details the chosen sample of each industrial sector per city.

Table (3-1): The number of manufacturing establishments per industry in accordance with the industries' relative weight.

Manufacturing Sector	Rwi (%)	ni
Food and beverages	20.2%	54
Leather	4.8%	13
Paper & Cartoon	3.8%	10
Chemical	1.1%	3
Plastic	1.6%	4
Wood & Furniture	32.2%	85
Aluminum & Metallurgical	36.3%	96

Table (3-2): Distribution of manufacturing establishments and sample sizes regarding; the years, relative weight, and obtained statistics.

Option City	E (2012)	E (2015)	E_c (2015)	<i>Rwc</i> (%)	<i>nc</i>	<i>nO</i>	<i>nF</i>
Hebron	3,151	3,197	2,146	24.2%	64	120	84
Jenin	1,366	1,386	938	10.5%	28	14	10
Tulkarm	860	873	591	6.6%	17	11	8
Nablus	2,534	2,571	1,741	19.5%	52	63	44
Ramallah	1,520	1,542	1,044	11.7%	31	109	76
Bethlehem	1,184	1,201	813	9.0%	24	38	26
Jerusalem	1,111	1,127	763	8.5%	23	8	6
Jericho	109	111	75	0.9%	2	7	5
Qalqilya	614	623	422	4.7%	13	4	3
Salfeet	411	417	282	3.2%	8	3	2
Tubas	168	170	115	1.2%	3	1	1

Note: E refers to the total number of all manufacturing establishments in the whole 14 sectors.

3.5 Data Collection Techniques

As was stated before, the data collection process of the thesis is based on four main different mechanisms:

- 1-** Documents, official reports, statistics, and publications.
- 2-** Meetings and interviews with the different relevant stakeholders.
- 3-** Pre-structured questionnaires.
- 4-** Research information for OSH calculations.

The first mechanism aims to determine and gather all the reports and previous researches that have already dealt with the issue of OSH in Palestine in general, and in the industrial sector in particular.

The sources of these reports are derived mainly from documents, records and annual reports of the MOL, PICs, the GUPTU, PCBS, and other press reports. On the other hand, the second mechanism has been targeting and interviewing officials in various positions, besides bodies who are closely related to OSH matter, such as: Deputy Minister of Labor, Director of General Inspection and Labor Protection Department., Director General of the Department of Studies and Development in the Palestinian Capital Market Authority (PCMA), Secretary General of the Palestinian Insurance Federation (PIF), journalists who are concerned with OSH and workers' issues, finally employers, as well as employees.

The main purposes of these interviews were harnessing efforts to understand the thorniest problems, and faults that are highly considered gaps-leading and accidents-causing in the industrial sector. Furthermore, to find the main common points between both views and reservations of all stakeholders so as to capture a starting promising point for a possible future solution. This phase was followed by an extensive study conducted through two detailed and comprehensive pre-structured questionnaires that were directed to both employers represented by the industrial establishments' management, as well as employees working in the same establishments.

The last section mechanism was the research information that distributed on the intended industrial establishments alongside the workplace questionnaire to pick up some important statistics related to OSH and belonging to these

establishments in order to conduct the OSH calculations and estimate the Palestinian industrial OSH rates.

Accomplishing these phases should result in the following objectives of both workplace and employees working conditions.

For the workplace side, the objectives of this study were:

- ◆ Identifying the establishments' conditions in terms of their: OSH requirements, OSH commitment, adoption and application of OSH conditions.
- ◆ Exploring the number of occupational accidents and injuries in industrial establishments during the last eight years, their causes, and the establishments' methods of dealing with them.
- ◆ Reconnaissance the authorities and officials' follow-up to OSH issues in the Palestinian industrial sector.

For the employees' side, the objectives were:

- ◆ Identifying the employees' working conditions in industrial establishments.
- ◆ Determining the probability of employees' exposure to risks, no matter what kind of risk it is.
- ◆ Assessing employees' awareness of risks, as well as their awareness of their safety and health.

3. 6 Questionnaires

Questionnaires prepared in this study were directed to:

1. The high-level managers of the targeted industrial establishments.
More specifically, the safety manager, the quality manager, or the human resources manager respectively.
2. The middle and low-level employees working in the same industrial establishments.

Both questionnaires were carefully designed according to some important points, figures, items, and pillars related to OSH that mentioned in the literature review. At the same time, questions were prepared to collect information in relative with the research's questions and hypothesis. Also, in essence, the questionnaires depended on the notes, highlights, and interests that were pointed to through the held interviews with the different OSH stakeholders, as well as specialists.

3.6.1 Questionnaires designs

● Workplace Questionnaire:

The establishments' questionnaire that appears in Appendix (1A) was divided into five main parts. Each part was designed to collect specific data that could serve the research in a definite area either through closed questions, semi-closed questions, or open-ended questions.

Part One: General information about the establishment, its industrial sector, the number of its exposed employees, and its insurance status.

Part Two: General information about the establishments' exposed employees; the age, the academic qualification, years of experience, the employment contract nature, as well as the number of working hours.

Part Three: Detailed information about; OSH requirements available in the establishment, OSH commitment, OSH preparations in the establishments' structure, policy, procedures as well.

Part Four: Detailed information about the occupational accidents, injuries, and fatalities in the establishment. This information included; the number of accidents, causes of occurrence, the number of resulting injuries or deaths, the number of occupational diseases, the number of lost workdays due to occupational accidents and diseases, the estimates of financial losses, the investigation and reporting processes, the inspection and cooperation.

Part Five: The last part of the workplace questionnaire was a separate part, which was directly related to the quantitative part of the research. It contained detailed statistics table from the targeted establishments about the number of occupational accidents and diseases between the years (2009-2016). The table consisted of eight columns that included; the number of fixed employees, the number of accidents, the number of injuries, the number of fatalities, the number of diseases, the number of lost working days, the kind of occupational disease, and finally, the estimated financial losses incurred by the establishment.

● **Employees Questionnaire:**

The employees' questionnaire that shown in Appendix (1B) was divided into four main parts, each part was also designed to serve the research in a definite area either through closed questions, or semi-closed questions.

Part One: General information about the employee and his establishment.

The sex, the age, the academic qualification, years of experience, years of work, the job title, the nature of job tasks, the job department, the working hours, and the nature of the employment contract.

Part Two: This part was divided into two main sections. The first contains detailed information about the OSH status. The insurance, accidents experienced, accidents' causes, the side paid for treatment, the side paid for compensation, exposure to occupational disease, and the availability of OSH requirements. The second section discussed the OSH requirements, types, designs, and the training to use.

Part Three: This part also was sectioned into two main sections. The first section discussed OSH training courses, whereas the second section discussed the employees' awareness to OSH issues like; types of risks, the nature of the safe working environment, and the establishment's concern to OSH. A three Likert Scale was used in the second section so as to measure the differences in the employees' answers.

Part Four: The last part was the one designed to evaluate the relationship between employees and trade unions, their roles toward employees and their OSH problems, and their abilities to help, support, and strengthen employees' side.

3.6.2 Questionnaires Validity

Both questionnaires were written using the Arabic language in order to enable both employers and employees to easily understand and answer them. The questionnaires' language, arrangement, sequence, and content were revised and judged by a group of academics, professors, as well as experts in the field of OSH to ensure the validity and the reliability of the collected data. Questionnaire validation is important to test whether the questions in both questionnaires are understandable, unambiguous, answerable, and comprehensive enough to cover the research questions as well as objectives. The revised edition of the questionnaires then distributed to three local industrial establishments so as to check the employers and employee's acceptance to fill out such long and comprehensive questionnaires, and to identify any possible problems that could emerge during the filling process. The previous step led to re-modify the questionnaires due to some comments, and ambiguity. After refinement, the questionnaires were distributed to more than 300 industrial establishments.

The distribution process was conditioned by the experts to be conducted in person for; more reliable results, a deeper and more realistic understanding of the state of industrial establishments and employees in terms of OSH, and to discover the extent of OSH awareness of both employers and employees.

3.7 Data collection

The distribution of the questionnaires took approximately 30 working days, distributed over eleven Palestinian cities and governorates, comprising more

than 360 industrial establishments to target the sample of 265 industrial establishments that was calculated earlier.

Table (3-3) shows the names of the cities, and the number of establishments visited in each city.

Table (3-3): The names of visited cities versus the number of visited establishments.

City	No. of Visited Establishments
Tulkarm	8
Salfeet	3
Tubas	1
Jenin	8
Qalqilya	4
Ramallah	60
Jericho	4
Nablus	50
Jerusalem	3
Hebron	75
Bethlehem	15
TOTAL	231

Due to some political, geographical factors, and most importantly because of obvious problems in the processes of monitoring, counting, and documenting of establishments' numbers, their sectors, their sizes, and their locations, there was a great difficulty in visiting the complete sample of establishments.

As a result of this, the distribution process was divided into two different strategies:

- **Direct distribution:** By visiting the establishments.
- **Indirect distribution:** Through a direct contact with the unreachable establishments by both telephone, and Email.

Based on the two strategies, 271 establishments were visited and other 97 establishments were contacted with. Of the 271 visits, 231 establishments' questionnaires were distributed, for the following reasons:

- i. More than (20) establishments that were mentioned in the top-exporters report, or other official records, were **not found** on the ground due to the termination of their industrial activities.
- ii. Approximately (8) of the establishments that were **also** mentioned in the report of the top-exporters establishments apologized for the cooperation as they **neither manufacturers nor exporters.**
- iii. More than (10) establishments denounced the cooperation as they were **mere workshops** or small plants that do not reach the level that qualifies them to be classified as industrial establishments. On the other hand, **they had no workforce.**
- iv. Some establishments that belong to a one whole working group managed by **one administration**, refused to fill out one separate questionnaire for each establishment. Otherwise, they filled out one questionnaire **on behalf of the group** as a whole.

As a result, the total number of distributed questionnaires was **265**, of which **175** were returned, **47** have not been responded to, and **43** have been immediately rejected to be filled out for reasons like; confidentiality, privacy, administrative policy, or availability.

Table (3-4) illustrates the total number of distributed workplace questionnaires, and the total number of returned ones according to the industrial sector.

Table (3-4): Number of distributed and returned workplace questionnaires in relative to the industrial sectors.

Industrial Sector	Total Distributed Workplace Questionnaires	Total Returned Workplace Questionnaires
Plastic Industries	25	20
Wood, Furniture, and mattresses Industries	42	27
Leather & Shoes Industries	26	22
Food & Beverages Industries	48	39
Chemical Industries	15	15
Paper & Cartoon Industries	18	14
Metal & Aluminum Industries	57	38
TOTAL	231	175

In terms of employees' questionnaires, the distribution mechanism was based on the workforce size in the visited establishments, as a proportion. (The workforce size related to the number of workers that are exposed to risk only). In more details, for each establishment with 15 employees and less, one employees' questionnaire was given, whilst those of more than 15 employees were given two or more employees' questionnaires. Finally, the total number of distributed employees' questionnaires was 199 questionnaires.

Table (3-5) shows the number of distributed employees' questionnaires in each industrial sector.

Table (3-5): The number of employees' questionnaires in each industrial sector.

Industrial Sector	Total Distributed Workers' Questionnaires
Plastic Industries	22
Wood, Furniture, and mattresses Industries	28
Leather & Shoes Industries	19
Food & Beverages Industries	46
Chemical Industries	16
Paper & Cartoon Industries	14
Metal & Aluminum Industries	54
TOTAL	199

It's obvious that the numbers of distributed questionnaires by sector have totally differed of those resulting from the sample calculation. Some were likely increased over some sectors, while others tend to be reduced for other industries. Several reasons were behind these differences:

- 1-** Some industries; such as the chemical industry, which is considered a very dangerous sector, has a significant number of establishments in the Palestinian industrial market. This made the selection of a very few samples of it unfair to the industry from one hand, and illogical at results' generalization on the whole sector.
- 2-** Many large establishments -that have heavyweight in the Palestinian market- in some definite sectors rejected to fill out questionnaires, both the workplace questionnaire and the employees' questionnaire which led to zero contribution from them to the sector.

3- Referring to the problems related to the establishment's classification and the industries' classification, many establishments of the metal and wood sectors specifically were found to be small workshops with workforce less than three, as they were mostly family business.

4- The large and growing establishments in other industrial sectors such as plastics, chemicals, and paper sectors, which entered the market with an interesting weight and work, as well as a great manpower size, made their neglect irrational.

5- The reality was completely different from figures. The presence among these establishments indisputably increased the awareness about the importance of some at the expense of others. This certainty changed somehow the establishments' selection criteria according to the sector's power, the establishments' size, the facilities' status on the ground, and their impact on the national economy as a whole.

3.8 Data Analysis Techniques

Based on choosing the mixed-method methodology for conducting this research, the data analysis technique should be mixed also. A mixed analysis approach was built on using quantitative data analysis techniques besides qualitative data analysis techniques. This section summarizes both techniques that used to analyze safety calculations and questionnaires as quantitative data and interviews as qualitative data.

3.8.1 Qualitative Data Analysis

Seven semi-structured interviews were conducted with seven officials from six different OSH stakeholders (MOL, CD, PIF, PICs, PCMA, and PGFTU) so as to explore and determine the critical issues related to OSH in Palestine in General, and in the industrial sector in particular. Interviews were transcribed and analyzed using the thematic analysis approach that was summarized in six phases by Braun and Clarke, 2006. These six phases are:

- ◇ Getting Familiar with Data.
- ◇ Generating Initial Codes.
- ◇ Searching for Themes.
- ◇ Reviewing Themes.
- ◇ Defining and Naming Themes.
- ◇ Validating Themes and Writing the Report.

Following these phases was the main approach to reach the needed themes.

3.8.2 Quantitative Data Analysis

This analysis technique was divided into two main processes. The first was the safety calculations process that was applied using OSHA-formulas to calculate the safety indices, rates, and statistics in the Palestinian industrial sector through the eight years study period. The second quantitative process aimed to analyze the quantitative data that resulted from the workplace and employees' questionnaires which were analyzed using (Statistical Package for Social Sciences (SPSS) Program) to illustrate the data collected, and test for possible correlations between the questionnaires' variables.

3.9 Safety Calculation Processes

To calculate the OSH rates in the Palestinian industrial sector, both the US and EU-OSHA formulas are applied. Although the PLL follows the ILO organization and apply its OSH standards and regulations, but, for the sake of comparison of Palestinian OSH position, and due to the huge importance of the US-OSHA which laws, regulations, and guidelines are used as information toolkits, and taught as a basic safety curriculum in schools and universities all over the world not only in the US.

3.9.1 Categorized Data

From 231 workplace questionnaires distributed, successfully 175 were returned. From the 175 returning questionnaires about 102 have filled out the table of statistics that attached to the questionnaire. Some establishments refused to fill it out as they do not have time to refer to previous records, some refused because they do not have any records, and others refused for privacy. At the end about 58.3% of the scope establishments accepted to share their OSH statistics and figures between the years (2009-2016).

Table (3-6) shows the exact number of the returned workplace questionnaires by sector and the exact number of establishments that filled out the statistical information table. On the other hand, Table (3-7) summarizes the OSH statistics of each industrial sector during the eight years study period that filled the statistics table.

Table (3-6): The number of final returned workplace questionnaires and filled out statistical tables by industrial sector.

Industrial Sector	No. of Returned Questionnaires	No. of Filled out Tables
Leather & Shoes Industries	22	11
Plastic Industries	20	15
Paper & Cartoon Industries	13	7
Chemical Industries	15	8
Wood & Furniture Industries	28	13
Food and beverages Industries	39	23
Aluminum & Metallurgical Industries	38	25
Entire Industrial Sector	175	102

Table (3-7): The OSH statistics of each industrial sector between the years (2009-2016).

Industrial Sector	Fixed Employees	O.A	O.I	O.F	O.D	LWH (Days)	Estimated Losses (USD/\$)
Leather & Shoes Industries	2,445	33	31	0	8	555	10,045
Plastic Industries	6,649	1,387	583	1	3	1,664	6,600
Paper & Cartoon Industries	1,989	184	186	0	3	521	49,150
Chemical Industries	1,737	51	46	0	11	194	1,850
Wood & Furniture Industries	2,266	138	109	0	0	907	137,800
Food and beverages Industries	6,669	376	262	2	26	2,041	50,190
Aluminum & Metallurgical Industries	6,273	941	896	1	1	3,002	66,020
Industrial Sector	28,028	3,110	2,113	4	52	8,884	321,655

Detailed OSH statistics and figures of the entire and each industrial sector can be found in Appendix (2).

As reported in the Table (3-6), the average occupational accidents cases in the targeted industrial sectors were nearly 389 accidents or cases per year, of which nearly 265 were non-fatal. In the same extent, an average of 7 occupational disease cases occurs yearly in these sectors. Nevertheless, the averages of fatal cases through these years were 0.5 cases per year. In order to get better reliable information regarding the Palestinian industrial OSH reality, OSHA calculations were used and applied.

3.9.2 Safety Calculations

3.9.2.1 OSHA Formulas

In this section, the main aim was to find the OSH rates and statistics for the eight targeted Palestinian industrial sectors and for the whole Palestinian industrial sector using the international US-OSHA and EU-OSHA formulas. The safety calculations were used to assess and evaluate the reality of the industrial sector compared to its relevance in other international and national countries. In the same extent, these calculations helped in comparing each sector of the eight industrial sectors with the other one so as to determine the most dangerous sector and the least dangerous one.

To conduct these calculations, the following formulas were applied:

☒ US-OSHA Formulas:

1. OSHA Incident Rate (*based on injuries and illnesses*): (Crowl & Louvar, 2002)

$$IR1 = \frac{\text{Number of injuries and illnesses}}{\text{Totally worked labor hours}} \times 200,000 \quad \dots \text{Eq. (3.1)}$$

2. OSHA Incident Rate (based *on lost workdays*): (Crowl & Louvar, 2002)

$$IR2 = \frac{\text{Number of lost workdays}}{\text{Totally worked labor hours}} \times 200,000 \quad \text{..... Eq. (3.2)}$$

3. Fatal Accident Rate: (Crowl & Louvar, 2002)

$$FAR = \frac{\text{Number of Fatalities}}{\text{Totally worked labor hours}} \times 10^8 \quad \text{..... Eq. (3.3)}$$

4. Lost Time Case Rate: (Close, 2010)

$$LTC = \frac{\text{Number of lost Time cases}}{\text{Totally worked labor hours}} \times 200,000 \quad \text{..... Eq. (3.4)}$$

5. Severity Rate: (Chacko & Gopinadhan, 2016)

$$SR = \frac{\text{Total number of lost workdays}}{\text{Total number of recordable incidents}} \quad \text{..... Eq. (3.5)}$$

EU-OSHA Formulas:

1. Fatality Rate: (Crowl & Louvar, 2002)

$$FR = \frac{\text{Number of Fatalities per Year}}{\text{Total number of Employees}} \quad \text{..... Eq. (3.6)}$$

2. Workplace Injury Rate: (WSH, 2016)

$$IR = \frac{\text{Number of Fatal \& Non-Fatal injuries}}{\text{Total number of Employees}} \times 100,000 \quad \text{..... Eq. (3.7)}$$

3. Accident Frequency Rate: (WSH, 2016)

$$AFR = \frac{\text{Number of workplace accidents}}{\text{Totally worked labor hours}} \times 1,000,000 \quad \text{.... Eq. (3.8)}$$

4. Accident Severity Rate: (WSH, 2016)

$$ASR = \frac{\text{Number of workdays lost to accidents}}{\text{Totally worked labor hours}} \times 1,000,000 \quad \text{..... Eq. (3.9)}$$

5. Occupational Disease Incidents Rate: (WSH, 2016)

$$ODIR = \frac{\text{Number of occupational diseases cases}}{\text{Total number of Employees}} \times 100,000 \quad \text{... Eq. (3.10)}$$

In both formulas, the Total Worked Labor Hours (TWLH) was calculated depending on the information and equations below:

Total Worked labor Hours: (Crowl & Louvar, 2002)

$$\begin{aligned}
 TWLH &= \text{Number of Working Hours per day (H)} \\
 &\quad \times \text{Number of Working Days per year (D)} \\
 &\quad \times \text{Total Number of Employees (E)} \\
 TWLH &= H \times D \times E \quad \text{..... Eq. (3.11)}
 \end{aligned}$$

Where:

H = 8 Hours / day.

D = 276 Days / year.

TWH = 2208 Hours / year.

Chapter Four

Results' Analysis and Discussion

Chapter Four

Results' Analysis and Discussion

4.1 Chapter Overview

In this chapter, collected qualitative and quantitative data are analyzed and discussed. The first part of the chapter analyzes both the qualitative and quantitative data. While the qualitative data was shaped through a number of semi-structured interviews with different OSH stakeholders, and observations that were observed from employers, employees, stakeholders, and the officials during various field visits. The quantitative data represents the results of the analyzed descriptive and quantitative statistics that dealt with the workplace and employees' questionnaires using SPSS software so as to determine the current status of the OSH reality in the Palestinian industrial sectors. The second part of this chapter discusses and compares in details the resulted findings with other reported and published figures.

4.2 Qualitative Data Analysis

Qualitative data is an important part to well define the thesis problem. Up to the researcher's knowledge, there is no specialized OSH information center that can provide researchers with reliable information about safety issues in the Palestinian industrial sectors. Therefore, it was very important to gather OSH information from various sources. The confusing contradiction regarding the OSH issues that formed from the data collected from the official sources was the vital reason behind the diversity of the information

sources. This diversity was the utmost necessity for a deeper understanding and greater insight into the reality of the situation in these industrial sectors. Official reports, publications, documentation, reported statistics, and observations were the main sources of the primary collected data. These data were intensively used to create baseline information from which interviews and questionnaires were built and will be discussed in subsequent sections.

4.2.1 Interviews' Analysis

Interviews and observations are important and popular data sources in qualitative researches. These tools make it easier to ask participants, stakeholders or the different related parties, open-ended questions (Creswell, 2012). The open-ended questions are a good mean to enable participants to express his/her point of view on the problem without affecting on others' opinions. In this section, the following six stakeholders were the focus of the study:

1. MOL.
2. CD.
3. PICs.
4. PIF.
5. PCMA.
6. PGFTU.

Seven semi-structured interviews were conducted with seven officials from 6 different OSH stakeholders (MOL, CD, PIF, 2 PICs, PCMA, and PGFTU) so as to explore and determine the critical issues related to OSH in Palestine in general, and in the industrial sectors in particular.

The main purpose of the semi-structured interviews was to fulfill the following:

- i. **The absence of a unified source of information:** Such a problem increases the ambiguity about the issue, as well as the complexity of obtaining the right logical information. This is specifically right when discussing a very sensitive problematic issue as the OSH. This point makes it imperative to ask the truth from each source with great caution and awareness.
- ii. **Exploration before understanding:** As the OSH issue is neither a single side responsibility, nor a one-entity dependent, the aim was to explore the causes of the problem according to each side's belief and vision, then understand their different views so as to; identify the gaps, and find a good starting point.
- iii. **The diversity of stakeholders:** It is absolutely impossible to structure a unified interview for such diverse group of people, especially, when each stakeholder looks to the problem from his own perception and is greatly sensitive to his interests. Table (4-1) shows the interviewees' institutions and job positions.

In addition to these interviews, a series of open-ended questions were added to the workplace questionnaire so as to reflect the employers' point of views and their perception of the OSH issues, as well as to determine the OSH state in the Palestinian industrial establishments. The interviews were analyzed using the (Thematic Analysis Approach) so as to create, organize, and

describe the ideas and data sets in details. This approach was used to detect the main demonstrating themes that clearly summarize the current situation of the OSH in the Palestinian industrial sectors as shown in Figure (4.1).

Table (4-1): The interviewees' institutions and job positions.

Stakeholders' Side	Institution	Interviewees' Job Positions
Financial Issues	PCMA	Director General of the Department of Studies and Development.
Insurance Union	PIF	Secretary General of the Palestinian Insurance Federation.
Insurance	2 PICs	1. Director General of the General Insurance Department. 2. Work accidents Department.
MOL	General Directorate of Inspection and Labor Protection.	Director of General Inspection and Labor Protection Department.
CD	Department of Prevention and Public Safety.	Director of Prevention and Public Safety Department.
Employees	PGFTU	Journalist, and interested in workers' affairs.



Figure (4.1): Braun and Clarke, 2006 Thematic Analysis Approach Phases.

Codes and the central themes developed for the discussed issues are shown in Table (4-2).

Table (4-2): The codes and the central themes developed regarding the discussed issues.

Discussed Issues	Code	Central Theme
OSH Problems	Priority	OSH System Development
Reduction of Occupational Accidents	Needs	
OSH Figures, Basics	Regulations	
Working Environment Working Conditions	Establishments' Situation	
Tools, Means, and Strategies	Organizational Matters	
OSH Awareness	Principles	Individuals' Development
Training Courses	Promotions	
Qualifications	Cultural Background	
Incentives	Motivations	
Fear/ Legal Right	Trust	
Regulations' Enforcement	Practices	
Monitoring Companies	3-Part Investigations	Stakeholders' Commitment
Inspection Follow Up		
Reporting & Documentation	Info Sharing Announcement	
Stakeholders' Responsibilities	Cooperation Support	
Occupational Accidents Costs	Financial Losses Productivity	OSH Returns
Lost Working Days		
Human Losses Skills & Expert Losses	Welfare Sustainability	
Internal & External Relations	Communications	
Ignorance, Rejection, & Apathy	Culture	OSH Challenges
Gaps in Regulations	Reviewing Regulations	
Penalties & Sanctions	Strict Law's Enforcement	
Political & Financial Situation	Barriers	
Problem's Recognition	Confrontation	OSH Success Factors
Real Interest	OSH Top Priority	
Internal & External Support	Real Cooperation Unified Efforts	
Plans, Actions, & Strategies	Good Orientation	
Continuous Work	Evaluation	

Explanation of the central themes emerged from the qualitative data analysis is shown in the following sections.

4.2.1.1. OSH System Development

Developing any strong system needs a lot of joint-efforts from unified responsible stakeholders. In relative to the OSH problem in Palestine, the OSH system seems poorly shaky due to its incompatible irresponsible stakeholders, where every stakeholder throws the responsibility to the other stakeholder. For example, The MOL side thinks that the OSH problem (if exists) refers to the employees and their carelessness. While the PIC's side believes that there is a real failure by OSH officials in the laws and regulations' enforcement, and in the inspection process execution. On the other hand, it is so easy to see the employers -and despite the modest working conditions they provide- throwing the responsibility to both officials and employees who seem carelessly or maybe desperately do not care.

Interviewing each OSH stakeholder raised the belief that there is a real OSH problem which could be a serious threat to the Palestinian industrial sectors and their employees unless the whole OSH system -starting with officials and ending with employees- will be restructured and united.

4.2.1.2. Individuals Development

First, it is important to illustrate that the word (Individuals) does not mean employees alone as some would think, absolutely no. In fact, it points to three kinds of people who are:

- ◆ Officials.

- ◆ Employers.
- ◆ Employees.

The OSH status in the industrial environment showed a huge gap between what the officials believe they achieved and what both employers and employees live. Of course, officials' attempts to develop a professional OSH environment can never be denied. However, the obvious gaps confirm that the OSH development process has been started from a misjudged level by the officials. The OSH issue is not an issue that could be easily inserted in the working fields. Such complicated issue needs a lot of persuasion and efforts to be included there, starting with raising the awareness and the effective education, passing through defining and explaining the legal rights and duties for each side, stressing on the necessity of the law enforcement, and ending with the effective execution to all these steps.

4.2.1.3. Stakeholders' Commitment

Another important available fact here is the lack of cooperation, coordination, and communication between the different stakeholders. Each party attempts to put causes and solutions' responsibilities to other stakeholders. This is a clear indication of the absence of joint united efforts between all involved parties of a problem that could never be solved without cooperation, coordination, sharing information, and for sure efficient feedback.

4.2.1.4. OSH Returns

For the first time, a central theme was agreed by two different parties of the OSH problem. Both the MOL and PIC's sides believe in the importance of OSH issues, and assure the need for an effective OSH system. The MOL and PICs' recognition of the OSH benefits and profits that could be returned to all parties can never be questioned or doubted. The big problem here is the beliefs of both employers and employees who consider OSH as a non-required luxury rather than an urgent necessity. Such beliefs elucidate to some extent exacerbate of the OSH problem, and once again bring to mind the importance of taking into consideration the previous theme relating to (Individuals' Development).

4.2.1.5. OSH Challenges

Determining the main OSH problems, gaps, misunderstandings sometimes, and barriers is the first and most significant step to find an answer to any question. The interviewees helped to uncover the most serious challenges that impede the development of the OSH in the industrial sector. These challenges were summarized in:

- * Culture Nature.
- * Educational Level.
- * Suitable Regulations.
- * Law Enforcement.
- * Financial & Political Barriers.

4.2.1.6. OSH Success Factors

This theme is a more inferred theme than being indicated to. As most interviewees denied the existence of the OSH problem and the occurrence of occupational accidents in the Palestinian industrial sectors, and due to the previous themes, the following factors were believed to be influential during the OSH development process:

- ✓ Confrontation/ Facing the Problem.
- ✓ Priority.
- ✓ Real Cooperation & Unified Efforts (Commitment & Cooperation).
- ✓ Good Efforts' Orientation.
- ✓ Continuous Evaluation.

Meeting challenges will undoubtedly bear fruit later. As mentioned previously, the OSH issue is not a simple issue that could be easily or fast implemented. On the contrary, OSH is the issue that mostly needs a lot of advanced precise planning. Furthermore, in order to succeed, it needs to be firmly established among all the involved parties. The Significant point to succeed in finding a solution is an explicit recognition of the existence of the problem; otherwise, the solution becomes impossible.

4.3 Quantitative Data Analysis

Questionnaires were designed to create a good information base regarding the OSH in the Palestinian industrial establishments. This base is the assistant mean in examining the research hypotheses as well as in answering the research questions that were formulated in (Chapter 1, Sec.1.6). Due to

their size, all returned questionnaires were stored using Microsoft Access Program to facilitate the data management. Then, after the data processing, the revised data variables were transferred, coded, and defined using the SPSS program, version 23. The reliability test was conducted using the Cronbach Alpha method so as to examine the internal consistency of both questionnaires.

Tables (4-3) and (4-4) shows the values of Cronbach Alpha for the workplace and employees' questionnaires respectively.

Table (4-3): Cronbach Alpha values for workplace survey.

Phase	No. of Items	Cronbach Alpha
OSH Requirements	29	0.84
Occupational Accidents & Diseases		

Table (4-4): Cronbach Alpha values for employees' survey.

Phase	No. of Items	Cronbach Alpha
OSH Information	33	0.83
A-Occupational Accidents & Diseases B- OSH Requirements		
Awareness of Danger Sources B-Awareness of OSH	23	0.70

After ensuring the questionnaires consistency, statistical analysis tools and tests like; the frequencies, means, percentages, and Pearson Correlation tests were conducted to explain and clarify the results, relations, and correlations between variables.

4.3.1 Surveys' Population

The research has two study populations; the workplace population, and the employees' population. This section describes in details some general information about the sample from both populations using the frequency and means.

4.3.1.1 Workplace Survey

4.3.1.1.1 Sector

The results of the workplace survey sample showed that metal industries ranked first with 23.3% in the respondents' list followed by food and beverages industries with 22.7%. Paper and cartoon industries ranked last with 8.5%. Figure (4.2) shows respondents by all industrial sectors under investigation.

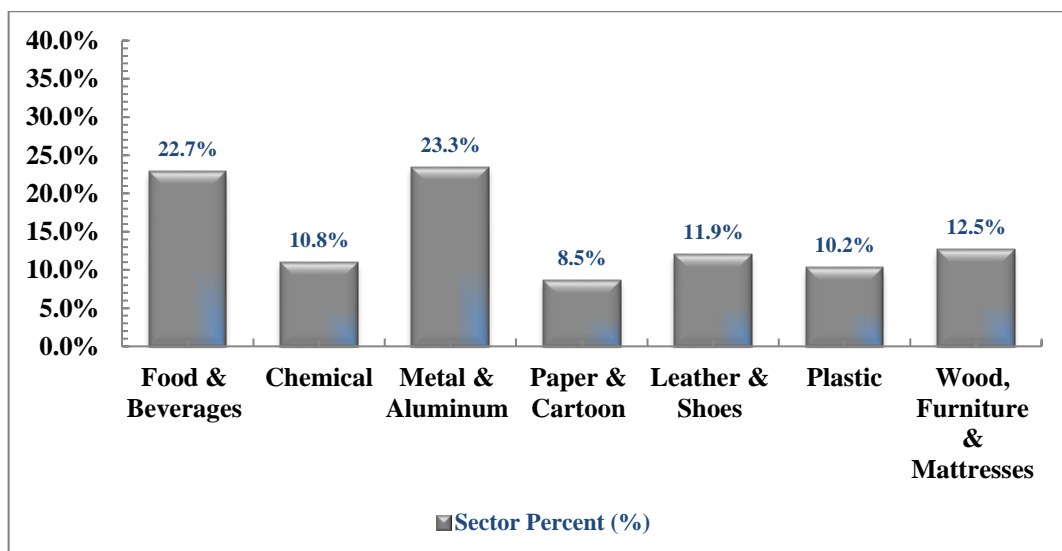


Figure (4.2): The ranking of the responding sectors to workplace Survey.

4.3.1.1.2 Location

The results in Figure (4.3) show that the largest number of the study sectors respondents was concentrated in Hebron by 34.1%, followed by Nablus 24.4%, then Ramallah by 19.9%. While the cities of Salfet and Tubas appeared last by 0.6% for each city. There is no surprise in these results since Hebron, Nablus and Ramallah cities are considered as the core of industry in Palestine.

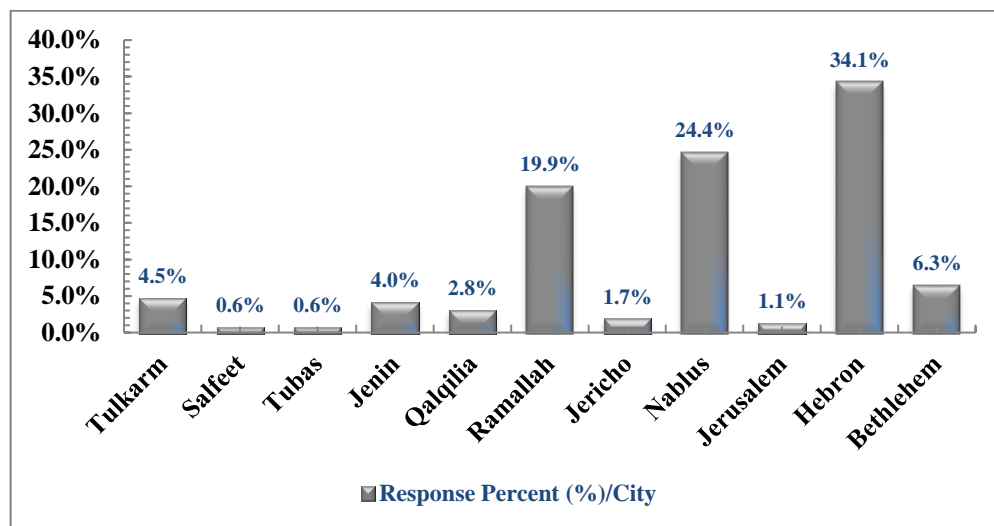


Figure (4.3): The location of the workplace respondents.

4.3.1.1.3 Age

Despite the old age of many large establishments, about 41.0% of the responding establishments were established after the year 2000, or after the official enforcement of the PLL. Figure (4.4) shows the distribution of the responding establishments' age.

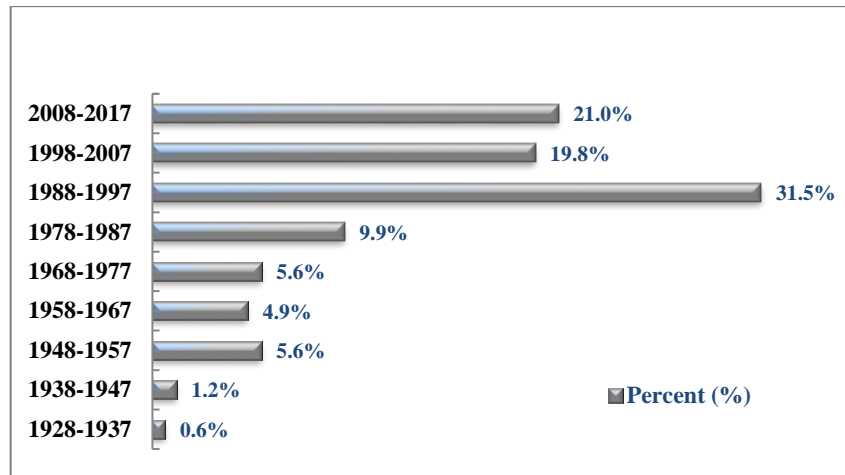


Figure (4.4): The Age of the responding establishments.

4.3.1.1.4 Size

More than 54.0% of the responding establishments have started their work with a Capital Cost (CC) that exceeds (0.25MJD) which means that about half of these establishments can be classified as large establishments from the economic side. Approximately 14.4% of these large establishments belong to food and beverages industries, while 11.1% of them refer to metal industries. In the third place came plastics industries with 7.8%, followed by paper and cartoon with 7.2%. Leather industries were fifth with 5.9% while wood industries ranked last with 4.6% followed by chemical industries with 3.3%. Both Figures (4.5) and (4.6) illustrate the size of the responding establishments.

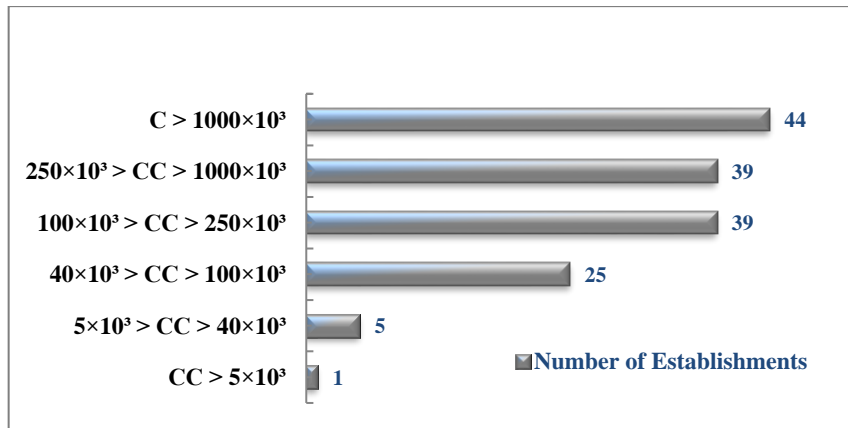


Figure (4.5): The number of responding establishments per capital size (JD).

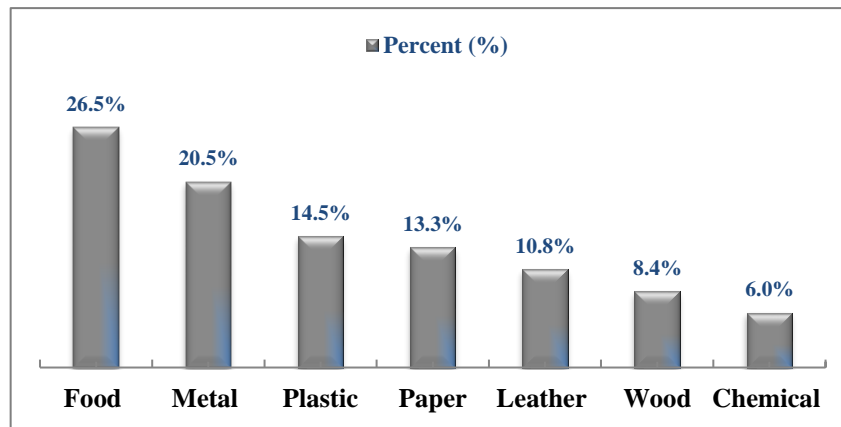


Figure (4.6): The responding establishments' size per sector.

4.3.1.1.5 Qualification

The research results showed that the academic qualification level of the responding establishments' owners was interestingly high. The represented results in Figure (4.7) revealed that 54.9% of the respondents have bachelor's degrees and more, while 29.5% have secondary certificates or less.

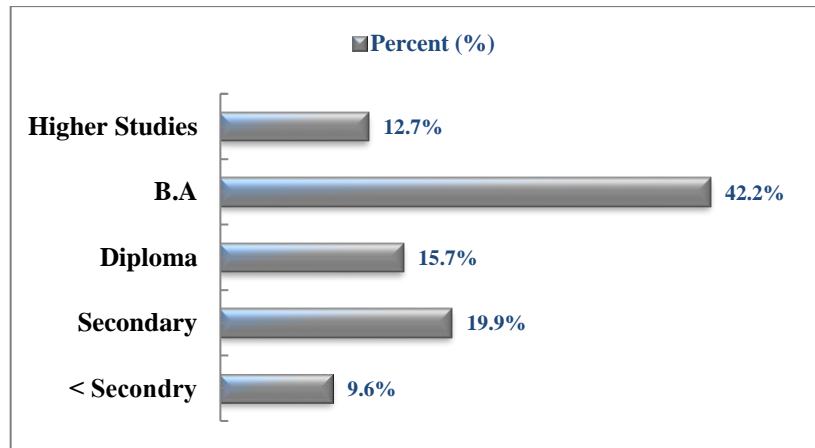


Figure (4.7): The workplace respondents' qualification level.

4.3.1.1.6 Employees

Figure (4.8) represents the workplace survey results, which showed that the highest average number of fixed employees is in paper and cartoon industries with an average of 74 fixed employees per establishment, then followed plastic industries with an average of 53 fixed employees per establishment. Wood industries had the lowest average with 10 fixed employees per establishment. In the same vein, the results showed that the highest average number of exposed employees to risk is in the plastic industrial sector with an average of 48 exposed employees per establishment, followed by metal industries with an average of 32 exposed employees per establishment, while wood sector had again the lowest average with 7 exposed employees per establishment.

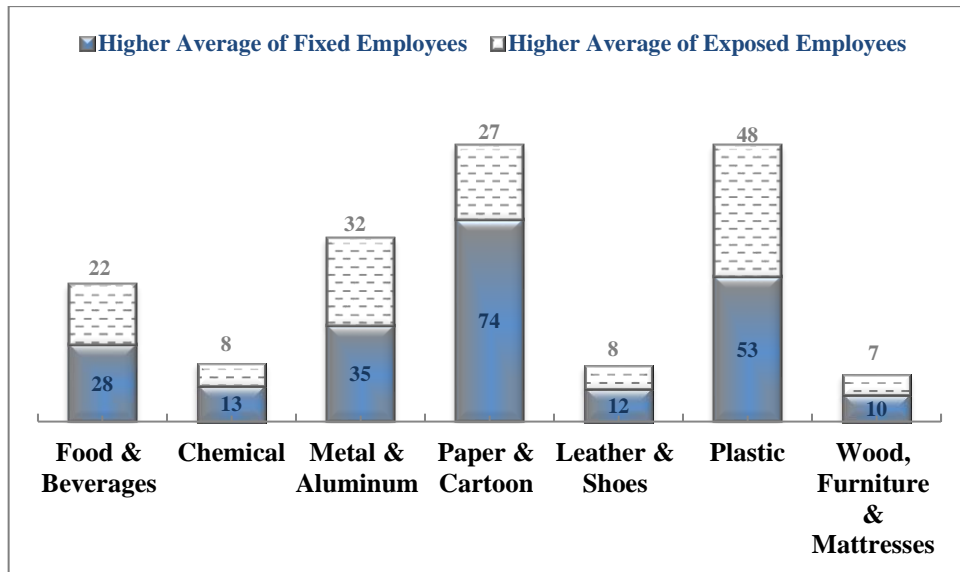


Figure (4.8): The number of fixed/exposed employees in each industrial sector.

4.3.1.2 Employees Sample

4.3.1.2.1 Gender

Figure (4.9) shows that 93.9% of the employees' questionnaire respondents were males, while only 6.1% of them were females. This result may refer to the nature of the industries themselves, which could be considered as more masculine than feminine.

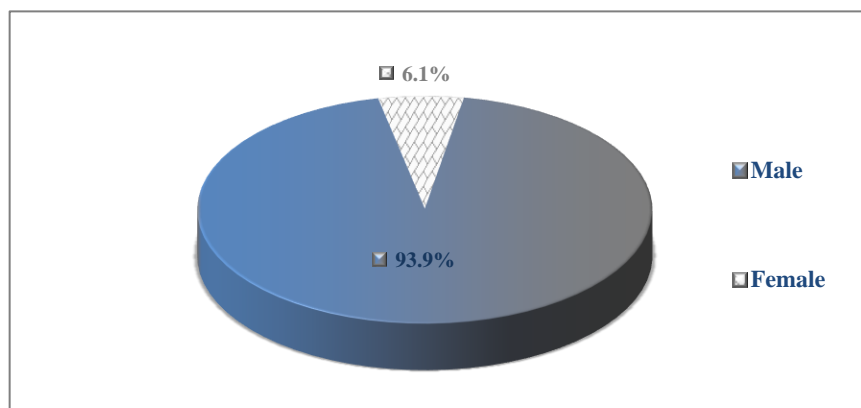


Figure (4.9): The respondents' gender of the employees' survey.

4.3.1.2.2 Age

The results of the employees' sample showed that 59.1% of the respondents were less than 30 years old, which means that the category of employees in the industrial sectors could be classified of the young categories in Palestine. Furthermore, the percentage of age group from (31-35) years old was 16.2% while the percentage of employees who are more than 36 years old was only 24.7%. Figure (4.10) illustrates the age categories of the respondents.

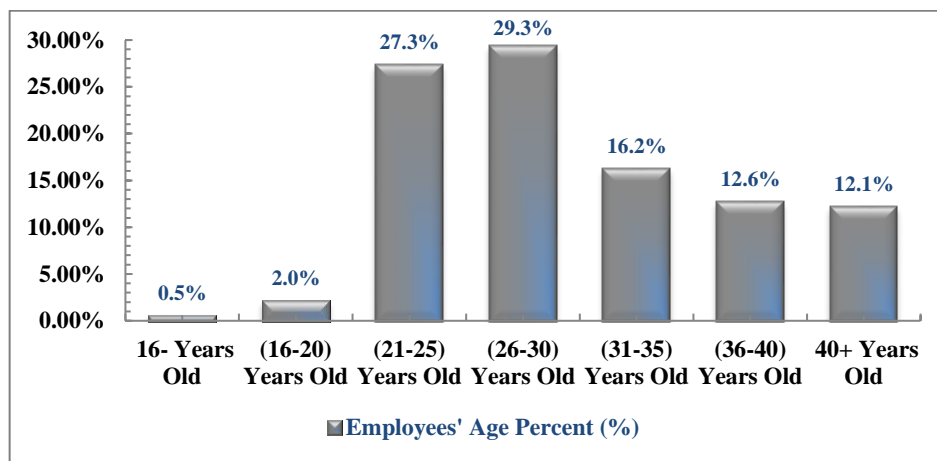


Figure (4.10): The distribution of the employees' age.

4.3.1.2.3 Educational Level

The results of the employees' questionnaire showed that 63.1% of the respondents had a secondary certificate or less. While the percentage of those having Bachelor degrees was about 22.1%. Figure (4.11) represents the academic classification of the respondents.

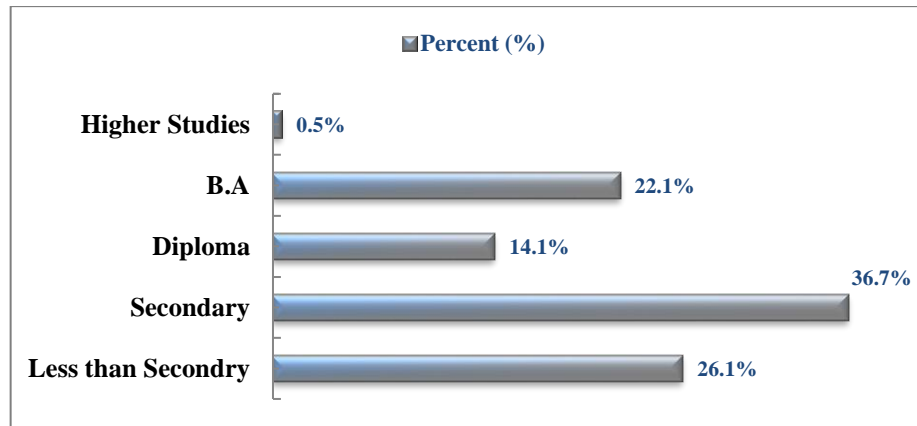


Figure (4.11): The employees' respondents' qualification level.

4.3.1.2.4 Experience

Figure (4.12) represents the employees' survey results regarding the respondents' working experience. The results showed that about 41.5% of the respondents had an estimated working experience of 5 years or less. While the percentage of those with more than 10 years working experience was about 33.8%.

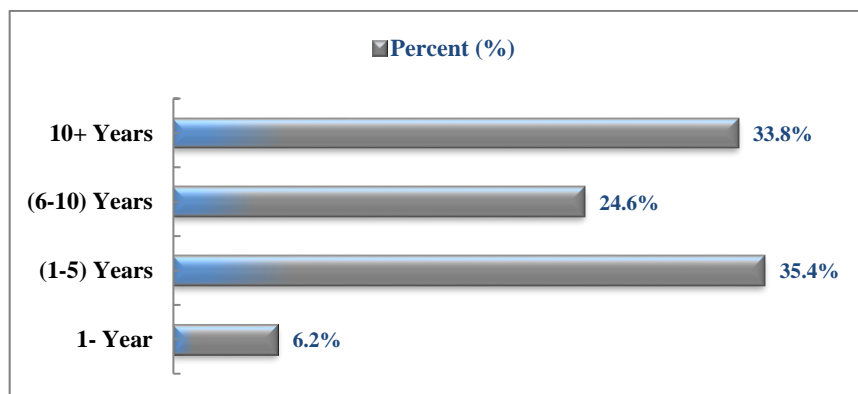


Figure (4.12): The employees' respondents' working experience.

4.3.2 OSH Requirements

4.3.2.1 OSH Requirements

Based on the workplace questionnaire analysis, it was found that about 92.4% of the industrial establishments claimed to provide the OSH requirements. Furthermore, about 96.0% of the industrial establishments have assured their commitment to applying the OSH laws and procedures stipulated by the PLL. Despite that, only 80.3% of these establishments have a hard copy of the OSH legislations that enforced by the law, and only 12.0% of them have an official international OSH certification. In the same context, the percentage of establishments that have an OSH department is 56.1%, while 68.8% of the establishments have a qualified OSH supervisor.

Food and metal sectors had the highest percentage for providing the OSH requirements with 23.9% for each sector followed by wood industries 13.2%. Plastic industries were the second lowest with 9.4% preceded by paper and cartoon industries 6.9%.

4.3.2.2 OSH Tools

According to the employees' questionnaire results, 92.3% of the respondents said that their establishments do provide them with the needed OSH tools against 7.7% of the employees who claimed that their establishments do *Not* provide them with the required OSH tools. Figure (4.13) details the percentages of the available OSH tools.

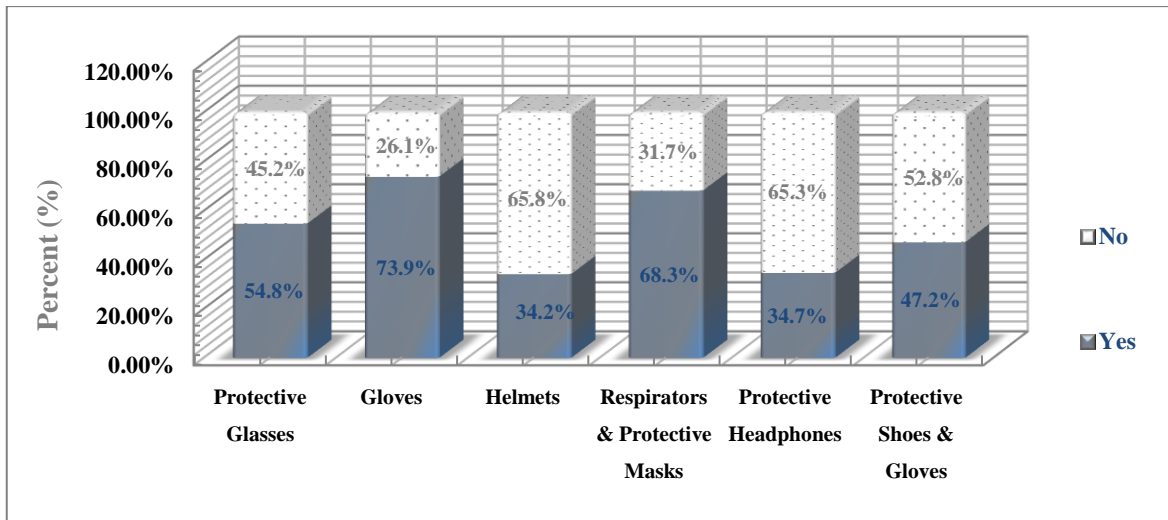


Figure (4.13): The percentages of the OSH tools' existence according to employees' survey analysis.

These percentages look different compared to the results' analysis of the workplace questionnaire which clearly appears in Figure (4.14).

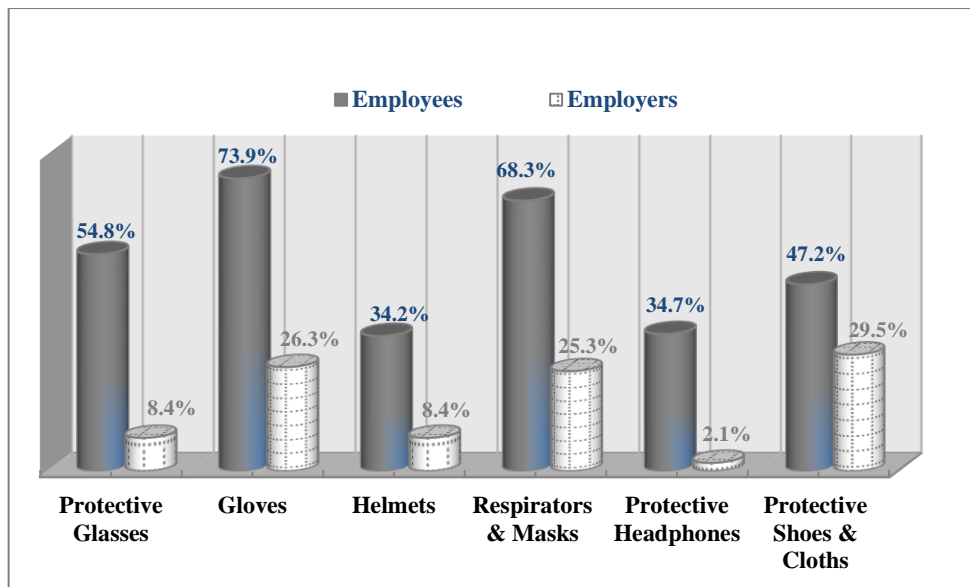


Figure (4.14): The percentages of OSH tools' existence according to both employees' and workplace survey analysis.

4.3.2.3 Health Services

95.8% of the employees agreed that their industrial establishments are concerned to provide them all possible health services. This consensus also coincides with the workplace respondents with about 96.5%.

4.3.2.4 Training Courses

The workplace results' analysis indicated that 41.2% of the establishments subjected their employees to specialized OSH training courses during their working period in the establishments. On the other hand, the employees' results' analysis revealed that only 26.7% of the employees have participated in governmental or non-governmental awareness training courses regarding OSH. 56.8% of these courses were organized by the establishments themselves, which means that the establishments' percentage of organizing OSH training courses was only about 15.1%.

4.3.2.5 OSH Insurance

Results of the workplace study showed that 95.1% of the industrial sectors - the main core of the research- confirmed insuring their employees against occupational accidents. 92.9% of the employees agreed on the previous results assuring being insured against occupational accidents. The percentages of the insured industrial sectors against occupational accidents are shown in Figure (4.15).

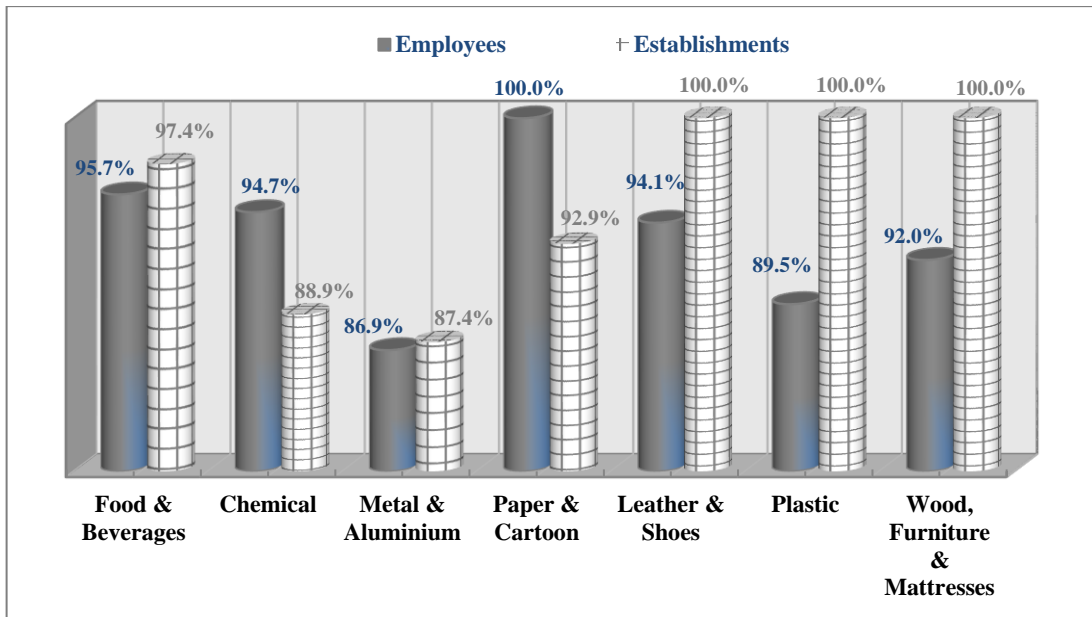


Figure (4.15): Percentages of insured industrial sectors according to workplace and employees' results.

4.3.3 Occupational Accidents and Diseases

Although the industrial establishments provide the OSH requirements and tools, this did not prevent occupational accidents, injuries or even diseases to occur. Figure (4.16) illustrates the estimated averages of the number of exposed employees, the occupational accident, the occupational diseases, and the number of lost working days due to these accidents and diseases in each industrial sector.

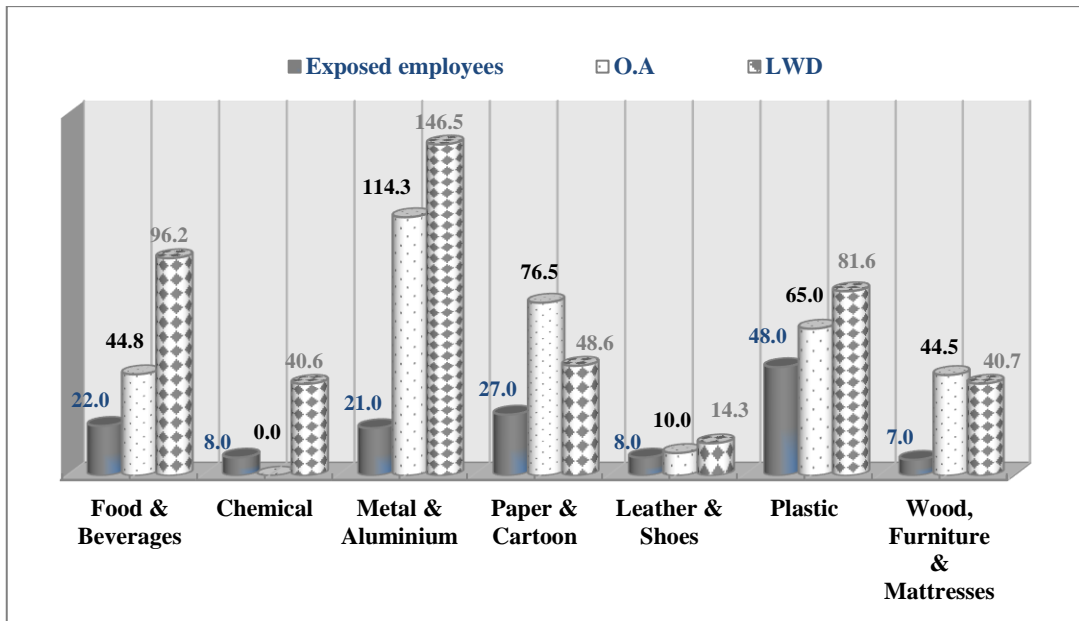


Figure (4.16): Estimated averages of exposed employees, occupational accidents, and lost working days per industrial sectors.

88.3% of the industrial establishments that claimed the existence of the OSH requirements have admitted the occurrence of at least (1-5) occupational accidents during the last year, 5.5% admitted (6-10) occupational accidents, 2.3% between (11-15) occupational accidents, 0.8% between (16-20), and 3.2% admitted the occurrence of more than 20 occupational accidents. In the same vein, 31.8% of their employees claimed that they were subjected to occupational injuries, while 9.1% claimed that they have been suffering from chronic diseases since they have started their occupation.

On the other hand, 93.6% of the occupational accidents that were reported by the workplace respondents lay in the (1-5) occupational accidents per year category, whilst 3.8% of them lay in the (6-10) occupational accidents per year categories and 1.3% for the accidents categories that exceed 11

occupational accidents per year. The results illustrated that the main notified entities of the occupational accidents occurrences were:

1. PIC » 70.5%.
2. MOL » 29.0%.
3. Police Department » 4.5%.
4. MOH and CD » 3.4%.

57.9% of the occupational accidents were investigated, although 73.9% of the industrial establishments do not have documented and effective investigation forms to use in the investigation process. Only 75.8% of the industrial establishments have taken post-accidents corrective actions and measures to reduce occupational accidents. However, 82.9% of the industrial establishments have expressed their concern to develop OSH strategic plans so as to reduce occupational accidents.

4.3.4 OSH Awareness

The results of analyzing the employees' survey showed that the percentages of employees' responses in relative to employees' awareness towards the risk sources in the workplace were as presented in Table (4-5). In the table, scale (3) means {to a certain extent}, scale (2) means {to a moderate extent}, while (1) means {to a zero extent}.

Table (4-5): The percentages of employees' awareness to risk's sources.

Question	(3)	(2)	(1)	Total
To what extent you are at risk of noise?	19.3%	62.0%	18.8%	100.0%
To what extent you are at risk of sharp and dangerous machines?	19.8%	57.3%	22.9%	100.0%
To what extent you are at risk of dangerous radiation?	2.1%	14.6%	83.3%	100.0%
To what extent you are at risk of toxic gases and emissions?	7.9%	31.6%	60.5%	100.0%
To what extent you are exposed to atmospheric hazards (temperature, humidity, sun)?	7.8%	31.8%	60.4%	100.0%
To what extent you think that lighting is appropriate in your workplace?	66.1%	30.2%	3.6%	100.0%
To what extent you think that ventilation is appropriate in your workplace?	61.3%	34.0%	4.7%	100.0%
To what extent you are at risk of sliding in your workplace?	8.8%	47.7%	43.5%	100.0%
To what extent you are at risk of falling in your workplace?	5.2%	32.1%	62.7%	100.0%
To what extent you are exposed to work under extreme pressure?	13.0%	50.8%	36.3%	100.0%
To what extent you think that the distances between the machines are suitable in your workplace?	45.3%	46.8%	7.9%	100.0%
To what extent you think that the design of emergency exits (if exist) is appropriate and safe in your workplace?	46.6%	32.5%	20.9%	100.0%
To the extent you think that the establishment's location is appropriate and suitable for the nature of the industry?	62.2%	32.6%	5.2%	100.0%
To what extent you assess your knowledge of the existence of the OSH procedures at your workplace?	52.1%	44.3%	3.6%	100.0%
To what extent you evaluate your compliance with OSH laws and regulations?	50.0%	45.8%	4.2%	100.0%
To what extent you assess your knowledge of OSH in general?	49.0%	47.9%	3.1%	100.0%
To what extent you think that (the enforcement of all necessary measures and procedures that provide a safe working environment) is one of your rights?	74.9%	22.5%	2.6%	100.0%
To what extent you think that the establishment is keen to provide a safe working environment?	65.1%	32.3%	2.6%	100.0%
To what extent you believe that the establishment is keen to insure all employees?	80.1%	18.3%	1.6%	100.0%

To what extent you believe that the establishment is keen to provide all its employees with their legal rights with respect to OSH?	62.7%	34.7%	2.6%	100.0%
To what extent you think that the establishment is keen to raise the employees' awareness of OSH?	65.4%	30.4%	4.2%	100.0%
To what extent you believe that the establishment is keen to comply with the OSH requirements enforced by the labor law?	69.1%	25.7%	5.2%	100.0%
To what extent you believe that the establishment is keen to inform the MOL of occupational accidents and injuries?	67.2%	21.7%	11.1%	100.0%

The previous table highlights some important facts regarding the employees' OSH awareness. The following headlines summarize these facts:

» **Working Environment:**

- 81.3% of the industrial employees are exposed to noise, 19.3% of them (to a certain extent).
- 77.1% of the employees are exposed to dangerous sharp tools and machines, 19.8% of them (to a certain extent).
- 16.7% of the industrial employees are exposed to the danger of radiations, 14.6% of them (to a certain extent).
- 39.5% of the employees suffer from poisonous gases, 7.9% of them (to a certain extent).
- 39.6% of the employees suffer from atmospheric hazards, 7.8% of them (to a certain extent).
- 56.5% of the employees are exposed to sliding dangers in the workplace, 8.8% of them (to a certain extent).
- 73.3% of the employees are exposed to falling dangers in the workplace, 5.2% of them (to a certain extent).

- 63.8% of the industrial employees suffer from working under pressure, 13.0% of them (to a certain extent).

» **Working Conditions:**

- 96.3% of the employees are satisfied with the workplace lighting, 30.2% of them (to a moderate extent).
- 95.3% of the employees are satisfied with the workplace ventilation, 34.0% of them (to a moderate extent).
- 92.1% of the employees think that the distances between machines are suitable, 46.8% of them (to a moderate extent).
- 79.1% of the employees think that the emergency exits' designs are appropriate and safe, 32.5% of them (to a moderate extent).
- 94.8% of the employees think that the establishments' locations are suitable to their industries' nature, 32.6% of them (to a moderate extent).

» **OSH Regulations:**

- 47.9% of the employees have a moderate to zero knowledge about the OSH Procedures existed in the workplace.
- 50.0% of the employees have a moderate to zero compliance with the OSH laws and regulations.
- 51.0% of the employees have a moderate to zero knowledge about the general OSH issues.
- 25.1% of the employees have a moderate to zero belief that the enforcement of the OSH law is an employee's right.
- 34.9% of the employees have a moderate to zero belief that their establishments are concerned to provide them a safe workplace.

- 19.9% of the employees have a moderate to zero belief that their establishments are concerned to insure all employees.
- 37.3% of the employees have a moderate to zero belief that their establishments are concerned to inform them of their legal rights.
- 34.6% of the employees have a moderate to zero belief that their establishments are concerned to raise their OSH awareness.
- 30.9% of the employees have a moderate to zero belief that their establishments are concerned to comply with the OSH requirements enforced by LL.
- 32.8% of the employees have a zero to moderate belief that their establishments are concerned to inform the MOL of the occupational accidents and injuries.

4.3.5 Environmental Intentions

The results of workplace survey showed that 73.3% of the industrial establishments produce industrial wastes. The nature of these wastes varies between 11.6% gaseous wastes, 81.8% solid wastes, and 6.6% liquid wastes. The resulted percentages for the wastes' disposing methods were as shown in Figure (4.17).

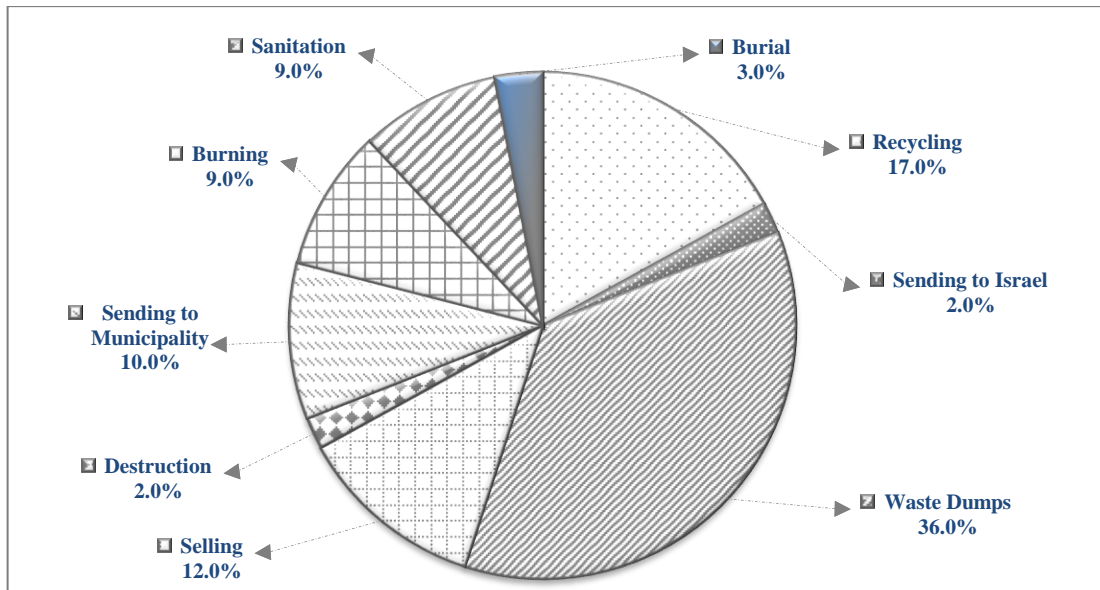


Figure (4.17): Percentages of industrial wastes' disposing methods.

4.3.6 External Correlation and Coordination

As for the workplace survey, the analysis showed that only 48.5% of the establishments have joint cooperative activities with governmental and non-governmental organizations so as to improve the OSH issues. It is noteworthy that the largest percentage of cooperation was with the MOL by 47.7% followed by the MOH by 33.7%. On the other hand, and regarding the employees' side, the results showed that only 29.9% of the employees belong to professional trade unions. About 33.0% of the workers emphasized that the presence of trade unions *Does Not* contribute to the protection of workers' rights in terms of OSH, whereas another 25.0% of them commented on that with the sentence (I do not know).

4.3.7 Testing Correlations among OSH Issues

The results of analyzing the workplace survey were tested to find the correlations between occupational accidents/injuries and OSH requirements, industrial sector, employees' commitment follow up, OSH training courses, OSH strategies, motivational incentives, and LWHs. Furthermore, these results investigated in the relations between the industrial sectors and occupational injuries, accidents, diseases, exposure to risk, as well as the LWHs.

On the other hand, the results of the employees' survey uncovered the existed and non-existed correlations between the occupational injuries and OSH requirements, the age, qualification, experience, working hours, the employees' contracts types, the motivational incentives, and the training courses. In the same manner, the correlations between occupational diseases and the primary and periodic medical examinations from both questionnaires were tested using the Pearson's chi-squared test (χ^2) with significant level (α) ≤ 0.05 .

4.4 OSH reality in the Palestinian Industries

It is greatly noticeable that there are huge differences between the figures obtained from the MOL, and PICs resources, as well as between those calculated or obtained from the quantitative and qualitative data resources, and those reported in 2018 from the industrial establishments (I.Es) themselves. This is very well seen in Figure (4.18).

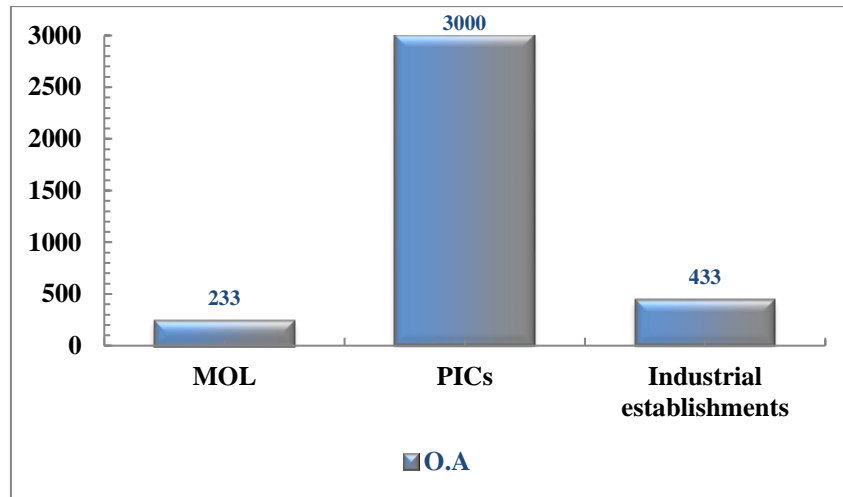


Figure (4.18): The numbers of occupational accidents according to the MOL and PICs (2016-2017) reports (MOL, 2016), and those obtained from the industrial establishments during the research's survey.

Despite the fact that the contradiction between the MOL and the PICs statistics reflects an apparent similarity between the statistics of the MOL and the I.Es, the OSH reality may still tend towards the PICs' statistics. The results of the questionnaires proved that 70.5% of the I.Es notifies the PICs as soon as an occupational accident occurs compared to 29.0% who notify the MOL. This shows much more logic from the establishments' view to guarantee the losses' compensations that incurred of occupational accidents before documenting the number of accidents. The results of the workplace survey emphasize that point through the percentages of documenting the occupational injuries, fatalities, and diseases which were 53.7%, 10.8%, and 21.1% respectively. This means that approximately there is *No* documenting system in more about 50.0% of the industrial establishments. Actually, these percentages look more realistic and closer to what was noticed through field visits and observations.

The previous statistics do not clearly reflect the serious status of the Palestinian manufacturing industries regarding occupational accidents and diseases. For a better understanding of the problem, it is important to scan and illustrate the statistics of each industrial sector according to the OSH calculations. Before that, it is necessary to mention that there is *No* detailed documented statistics for each separate industrial sector neither in MOL nor in PICs databases.

The absence of these figures casts a shadow over the reality of the OSH in each sector. And more importantly, it conceals the degree of seriousness and the level of danger of each of these sectors, which must be identified, determined, and evaluated in order to activate greater OSH procedures, as well as to enhance the role of other official and local bodies in accordance to OSH.

4.4.1 The OSH Requirements

In any dangerous workplace regardless of its degree of danger, the OSH requirements could be classified into two main irreplaceable parts:

- Built-in Requirements.
- External Requirements.

Both parts are essential, and both parts should be within the establishments' OSH systems. The main difference between them is that the first requirements are built in with the establishment's entity, its structure, and its working system. On the other hand, the other requirements are added-in requirements where their addition depends on the establishment's work

nature. The built-in requirements are called the Basic Health and Safety Requirements (BHSR), whereas the others are called Personal Protective Health and Safety Requirements (PPHSR) or OSH personal tools. The following sub-sections focus on these two types of requirements, their existence within the industrial establishments, and their role in promoting the OSH issues.

4.4.1.1 Basic Health and Safety Requirements

For a safe workplace, the needed BHSR are; fire extinguishing means, first aid tools, emergency exits, awareness and guidance, periodic medical examinations, reporting accidents, and workers' insurance. The latest statistics on the availability of these BHSR in Palestinian industrial establishments shown in Table (4.6) were shown in both Jaber et al., 2008, and Zaghlool, 2008. However, they mentioned the estimated percentages of the absence of the BHSR from industrial establishments, except what mentioned previously (Chapter 2, Sec.2.6), about no clear statistics regarding preliminary medical examinations and accidents reporting.

In contrast, Table (4.6) determines the recent percentages of the *availability* of the BHSR in the industrial establishments compared to the previous studies.

Table (4-6): The estimated percentages of the availability of the BHSR in the industrial establishments for the years; 2004, 2008, according to Jaber et al., 2008; Zaghloul, 2008, and the 2018 workplace questionnaire analysis.

BSHR	2004	2008	2018	
			W	E
Fire extinguishing means	69.5%	68.0%	68.0%	85.1%
First aid tools	27.9%	75.0%	97.7%	94.9%
Emergency exits	39.5%	56.0%	82.8%	77.6%
Awareness and guidance	83.7%	38.0%	73.0%	83.0%
Primary medical examinations	-	-	32.4%	33.5%
Periodic medical examinations	-	10.0%	31.4%	25.8%
Reporting accidents	-	37.0%	85.3%	90.4%*
Workers insurance	70.0%	58.0%	95.1%	92.9%

W: Workplace Percentages.

E: Employees Percentages.

*: This percentage refers to the employees' knowledge about reporting accidents and the entity for which they should report the accident, not for the number of reported accidents.

This table highlights the great improvement in the I.Es' orientation to provide BSHR in the workplace in the year 2018 in comparison to 2004 and 2008. In spite of that, within a period of ten years of PLL, these percentages may seem very small despite their rise. This is especially true in a time that witnesses great automation evolution, technological development, the spread of awareness in the world, and most importantly, the economic openness that provide these requirements at different prices and different qualities that suit all.

Anyway, the previous statistics bring the employers and employees' views closer in relative to the availability of the BHSR requirements. If it is about the entire industrial sector, it seems to be very optimistic. But this convergence was clearly absent in separate industrial sectors. Table (4-7) highlights more precisely the different views of employees and their employers towards the availability of the BHSR in each sector.

Simultaneously, this table draws a clearer and fuzzier image to the OSH situation in the Palestinian manufacturing industries, exactly like a situation that appears in similar features but non-homogeneous colors. In other words, the previous table shows the OSH state ranging from the full incompatibility to the full compatibility between the employers and employees' views in a very contradictory way.

To perceive the signification of the previous paragraph, a comprehensive elaboration for the results in Table (4-7) will be presented below.

Table (4-7): The estimated percentages (%) of the BHSR in each industrial sector according to the employees and their employers.

OSH Requirement	Food & Beverages		Chemical		Metal		Aluminum		Paper & Cartoon		Plastic		Wood & Furniture		Leather & Shoes	
	W	Es	W	Es	W	Es	W	Es	W	Es	W	Es	W	Es	W	Es
Preliminary Medical Examinations	60.00	60.90	26.30	26.30	28.60	19.00	0.00	33.30	21.40	28.60	22.20	21.10	33.30	25.00	15.00	31.30
Periodic Medical Examinations	55.00	45.70	31.60	10.50	26.50	14.60	33.30	25.00	14.30	28.60	16.70	21.10	28.60	20.80	20.00	25.00
Preventive Medical Examinations	32.50	95.60	16.70	100.00	14.70	95.10	0.00	100.00	0.00	78.60	11.80	84.20	19.00	87.50	25.00	88.90
First Aid Tools	95.00	100.00	100.0	94.70	97.10	97.60	100.00	83.30	100.00	71.40	100.00	100.00	100.00	95.80	95.20	94.10
Resident Physician	0.00	47.80	0.00	21.10	2.90	35.70	0.00	33.30	7.10	42.90	0.00	26.30	5.00	54.20	5.00	35.30
Public Health Services	97.40	100.00	94.70	94.40	100.00	100.00	83.30	90.90	78.60	92.30	94.40	89.50	94.70	95.50	76.20	88.20
Fire Extinguishing Means (F.E.Ms)	76.90	93.50	84.20	84.20	52.90	80.50	33.30	58.30	64.30	71.40	77.80	100.00	77.30	87.50	55.00	82.40
Pre- Use Training for F.E.Ms	86.80	76.10	94.40	57.90	82.90	58.50	83.30	66.70	64.30	50.00	88.90	57.90	77.30	54.20	85.00	82.40
Emergency Exits	90.00	82.60	84.20	84.20	74.30	66.70	66.70	66.70	50.00	64.30	94.40	89.500	85.70	83.30	95.20	76.50
Evacuation Plan	65.80	76.10	42.10	57.90	40.00	51.20	50.00	66.70	42.90	42.90	50.00	44.40	66.70	75.00	71.40	76.50
Pre-Evacuation Training	62.20	76.10	31.60	57.90	24.20	51.20	50.00	66.70	28.60	42.90	38.90	44.40	61.90	75.00	52.40	76.50
Emergency Phone Numbers	57.50	93.50	66.70	84.20	58.80	88.10	66.70	66.70	50.00	71.40	72.20	94.70	72.70	91.70	57.90	88.20
Identification Cards for Machines	47.50	63.00	73.70	63.20	64.70	59.50	50.00	83.30	71.40	57.10	61.10	57.90	65.00	58.30	42.90	86.70
Pre- Use Training for Machinery	95.00	82.60	100.0	78.90	100.00	88.10	83.30	91.70	92.90	71.40	100.00	84.20	95.50	79.20	85.70	81.30
Periodic Machines' Maintenance	95.00	97.80	94.70	94.70	94.30	97.60	83.30	100.00	92.90	78.60	100.00	100.00	100.00	96.00	95.00	87.50
OSH Training Courses	60.00	41.30	44.40	38.90	38.20	22.00	40.00	8.30	46.20	7.70	11.10	15.80	31.80	16.00	40.00	38.90
Warning Signs	85.00	91.30	84.20	89.50	68.60	71.40	66.70	91.70	71.40	64.30	77.80	89.50	70.00	84.00	85.70	75.00
Awareness & Guidance	67.50	91.30	63.20	89.50	74.30	71.40	66.70	91.70	64.30	64.30	55.60	89.50	66.70	84.00	81.00	75.00

Preliminary Medical Examinations:

The preliminary medical examination witnessed an agreement between employees and employers' percentages in food, chemical, paper, plastics, and wood industries in an almost identical manner. At the same time, these percentages changed by slight differences in metal industries and high differences in aluminum and leather industries. It is important to mention that despite the agreement; these percentages really look very low regarding one of the most important OSH requirements.

Periodic Medical Examinations:

The employers in the industrial sectors assure performing periodic medical examinations at their establishments, while their responses were more hesitant in the paper, plastics and leather sectors. Also, and as mentioned above in the primary examinations, the employers' responses percentages are really low regarding one of the most important OSH requirements.

Preventive Medical Examinations:

With regard to preventive medical services, the results of the analysis showed a great contradiction between the responses of the employees and employers. This contradiction raises significant doubts about the credibility of these percentages and the validity and realism of the employees' responses.

First Aid Tools:

Employees and employers have shown a great deal of concurrence about the availability of first aid tools in the industrial establishments. These tools are considered one of the most important OSH requirements.

Resident Physician:

More doubts were formed around the responses of employers and employees regarding the presence of a qualified resident physician within the establishments. The responses of the employers were; 0.0% confident of his absence, whereas the percentage of the employees' responses exceeded 50.0% ensuring his presence.

Public Health Services:

Most industrial sectors witnessed a great agreement between the responses of employees and their employers in relative to the availability of public health services at the establishments, except aluminum, paper and leather sectors, which showed moderate agreement.

Fire Extinguishing Means (F.E.Ms) & Pre- Use Training for F.E.Ms:

With the exceptions of chemical, paper, and wood industries, which respectively witnessed a full and good compatibility with regard to the FEMs, employees showed another discrepancy between their responses' percentages and the responses' percentages of the employers in the remaining industrial sectors. This contradiction has undoubtedly been reflected on the availability of the FEMs pre-use training. While workplace employees

denied training on fire systems prior to their use, employers have confirmed that their employees were trained on fire systems to learn how to use them when needed. A new contradiction raises doubts about the reality of what available and what unavailable in these establishments, the compatibility between employees and employers, and their responses' credibility.

Emergency Exits, Evacuation Plan, & Pre-Evacuation Training:

With regard to emergency exits, evacuation plans, and pre-evacuation training, the establishments' owners indicated to their existence with percentages ranging from 50.0% in the paper sector to 95.2% in the leather sector. These percentages were approved by the employees for emergency exits only. In relative to evacuation plans and pre-evacuation training, the employees' responses percentages were higher than those of employers except in plastic industries. Again, the differences between the employers and their employees' responses should be taken into consideration.

Emergency Phone Numbers:

The discrepancy is getting bigger once again, this time about providing clear and visible emergency phone numbers in the industrial establishments. Whilst employees insist on their availability, employers tend to be more moderate in their responses. Employees' responses range from 71.4% to 94.7%, but employers' responses were between 50.0% and 84.2%. The only case that witnessed full compatibility in this matter was in the aluminum sector with 66.7% for both parties.

Identification Cards for Machines, Pre- Use Training for Machinery, & Periodic Machines' Maintenance:

Employers claimed that machines' identification cards are given to employees prior to their use. Although employees agreed to the existence of these cards, a clear fluctuation appeared in their responses. While employers' percentages in chemical, metal, paper, plastic, and wood sectors have surpassed the employees' percentage, they fell down again in food, leather and aluminum industries in favor of employees' percentages.

On the same vein, employers have unequivocally assured that their employees are provided a pre-use training on machines in most sectors including food, metal, chemical, paper, plastic, and wood. Employees' approval percentages for employers' responses can be described as (very good). This compatibility has increased more and more regarding periodic machines' maintenance where the percentages of employers ranged between (83.3%-100.0%), and the percentages of employees ranged between (78.6%-100.0%).

OSH Training Courses:

For OSH training courses, the employees of aluminum and paper sectors have strongly denied access to this type of training, even though employers have assured that their employees have really been given such courses. The percentages of employees' responses compared to employers' responses in both sectors were as follows:

- 8.3% employees to 40.0% employers (Aluminum sector)
- 7.7% employees to 46.2% employers (Paper sector)

This negation was not far in food, metal, and wood industries, which witnessed a significant divergence between the employers and employees' responses, where its increase tends to the employers' side.

Warning Signs & Awareness & Guidance:

With the exceptions of paper and leather sectors, employees' percentages that approved the existence of OSH warning signs at dangerous sights in the workplace were more than those of employers. There were obvious differences between the responses' percentages of employees and employers in aluminum, plastic and wood sectors.

The difference keeps there when related to the OSH instructions and guidance, in particular, in food, aluminum, plastic, and wood sectors. The only compatibility case was in the paper industrial sector, with a percentage of 64.3%.

The analysis of Table (4-7) for the responses of both employees and employers regarding the presence of the most basic and important OSH requirements, whether the personal or workplace ones, shows a big gap, greater problems, and above all, it raises big obvious doubts about the credibility of both employers and employees the moment they responded to the questionnaires and their concern for giving real reliable answers compared to what has been already observed on the ground.

In addition, these differences and contradictions can explain up to a point the reasons behind the presence of some certain problems that directly affect and

lead to occupational accidents, injuries, and diseases in the industrial sectors. More necessary, this analysis strongly shed light on:

- A. The employers and employees' wrong perception toward most OSH concepts such as; fire system, emergency exits, evacuation plans, occupational accidents, occupational diseases, exposure to risk, etc.
- B. The necessity of explaining the (*Must*) for providing/having the basic and essential OSH tools and equipment for both employers and employees, and the risks of their absence.
- C. The necessity of identifying and determining the roles of the different stakeholders in monitoring and strengthening the presence of these OSH basics within the establishments. Furthermore, promoting the employees' confidence and freedom to express the factual picture of the working environment in which they live instead of leaving them constrained by fear and hesitation.

4.4.1.2 Personal Protective Health and Safety Requirements

PPHSR or the OSH tools differ depending on the type and nature of the work performed by the employees in the industrial establishment. Some employees need more OSH tools and some less. However, what is nationally and internationally agreed upon is that the OSH tools must be provided to all employees as a basic right so as to protect their lives from occupational injuries and diseases.

The basic OSH tools were previously categorized into main six categories:

- 1) Protective Glasses.
- 2) Gloves.
- 3) Protective Shoes & Cloths.
- 4) Helmets.
- 5) Protective Headphones.
- 6) Respirators & Protective Masks.

The previous sub-section reinforced some hypotheses about the weakness of the OSH systems in most industrial sectors which were supported by the inconsistency and incompatibility between the employees and employers' responses, as well as the establishments' concern to provide most BHSR. The best sectors regarding providing BHSR were metal industries which came first with 29.0%, followed by leather industries with 14.5%. Plastics and paper industries came third with 12.9%, while food industries reached fourth with 11.3% to send chemical and wood industries last with 9.7%.

Figure (4.19) illustrates the ranking of the industrial sectors in providing BHSR.

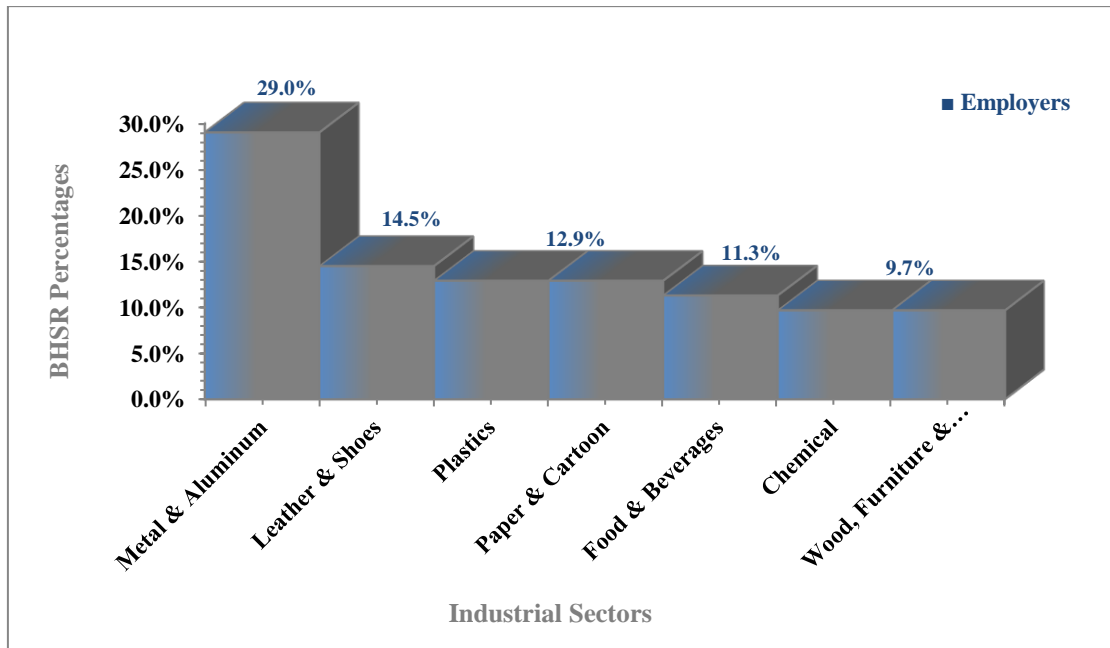


Figure (4.19): The sectors' ranking in providing BHSR.

Based on the employees and employers' responses, these percentages significantly differed among sectors in the provision of the OSH tools. The worst sector in providing these tools was the paper sector with 5.8%, followed by plastics sector with 9.9%. Leather sector came third with 11.0%, while wood sector occupied a level up with 12.8%. In the sixth place came chemical industries by 15.7%. Food and metal industries were the best sectors providing OSH tools within all other sectors with 22.1% and 22.7%, respectively.

Figure (4.20) illustrates the ranking of the industrial sectors in providing PPHSR in their establishments according to both the employees and employers' responses.

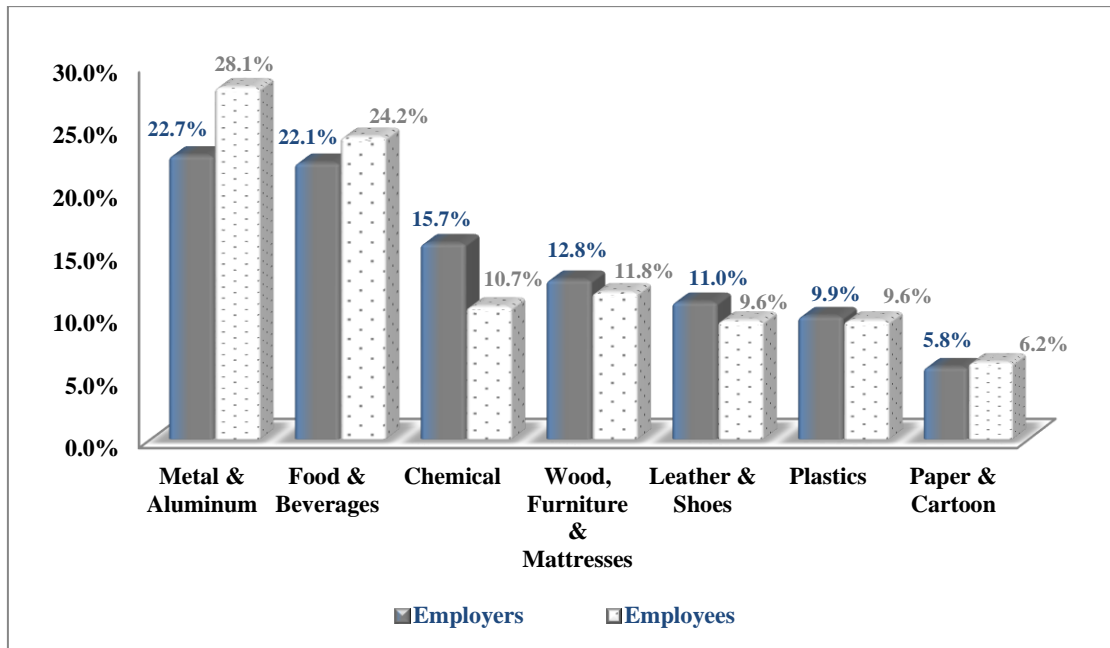


Figure (4.20): The sectors' ranking in providing PPHSR according to the employees and their employers.

4.4.2 Occupational Accidents and Diseases

A clear indication of the direct relationship between the non-compliance with the OSH laws and requirements approved by the PLL in 2000 and the continuation of the occurrences of the occupational accidents and diseases was clearly presented by NOSHC, 2015. However, after extensive analysis for the interviews, the questionnaires, and the observations taken from the Palestinian industrial establishments, it can be emphasized that the OSH problem and the occupational accidents and diseases occurrences are much more seriously deeper to be only related to the compliance with the OSH requirements.

In this chapter, observing the figures, averages, and percentages regarding the occupational accidents and diseases may show lack of direct correlation between some variables, including the compliance with the OSH

requirements and the number of occupational accidents. Statistically maybe, but the Palestinian OSH reality seems more dangerous than numbers show. However, this analysis study is not an attempt to force the creation of this kind of correlations as much as it is a profound study to analyze; the answers obtained from all the research methodologies, the behaviors, and attitudes while giving the answers, the considerable contradiction between answers, and the absence of logic and credibility in most of these answers.

For more clarification, figures may confirm the availability of all OSH requirements in all industrial establishments, for which once a small visit holds, a disastrously catastrophic OSH reality will be revealed. This discrepancy, which was previously reported on most BHSR percentages, is once again showing up in reading and interpreting the occupational accidents and diseases in the same sectors. For a deeper understanding, this section's goal is to declare the figures of occupational accidents and injuries by analyzing both:

1. The results of the OSH calculations.
2. The results of the surveys' analysis.

4.4.2.1 The OSH Calculations Results

US-OSHA formulas were conducted starting with Eq. (3.1) to Eq. (3.5) to calculate; the Incidents Rates (IR1&IR2), FAR, Lost Time Case Rate (LTCR), and Severity Rate (SR). Summarized results for each industrial sector and the entire industrial sector rounded to the nearest two decimal

places are presented in Table (4-8), whereas the detailed results for these sectors between the years (2009-2016) can be found in Appendix (3).

Table (4-8): The US-OSHA rates for each industrial sector and the entire industrial sector during the eight past years.

Industrial Sector	IR1	IR2	FAR	LTC	SR
Leather & Shoes Industries	1.5	20.3	0.0	1.4	13.2
Plastic Industries	18.8	21.1	6.4	8.0	1.2
Paper & Cartoon Industries	8.5	24.4	0.0	8.5	2.9
Chemical Industries	3.2	9.0	0.0	2.2	3.3
Wood & Furniture Industries	7.5	50.5	0.0	5.8	6.9
Food and beverages Industries	5.3	26.1	10.4	3.7	4.7
Aluminum & Metallurgical Industries	13.7	42.8	6.5	13.0	3.2
Entire Industrial Sector	10.3	28.1	5.4	7.1	2.8

4.4.2.2 EU-OSHA Calculations

EU-OSHA formulas were conducted starting with Eq. (3.6) to Eq. (3.10) to calculate; the Work Injury Rate (IR), the Fatality Rate (FR), the Accident Frequency Rate (AFR), Accident Severity Rate (ASR), and the Occupational Disease Incidents Rate (ODIR).

Summarized results for each industrial sector and the entire industrial sector rounded to the nearest two decimal places are presented in Table (4-9), whereas the detailed results for these sectors between the years (2009-2016) can be found also in Appendix (3).

Table (4-9): The EU-OSHA rates for each industrial sector and the entire industrial sector during the eight past years.

Industrial Sector	IR	FR	AFR	ASR	ODIR
Leather & Shoes Industries	1,271.9	0.0	6.1	101.5	320.9
Plastic Industries	8,820.4	1.40×10^{-4}	94.1	105.8	39.4
Paper & Cartoon Industries	9,329.1	0.0	41.9	122.2	127.5
Chemical Industries	2,646.0	0.0	13.2	44.9	572.2
Wood & Furniture Industries	6,640.3	0.0	37.3	252.7	0.0
Food and beverages Industries	3,799.3	2.30×10^{-4}	24.9	130.3	348.4
Aluminum & Metallurgical Industries	1,4418.8	1.43×10^{-4}	68.3	214.0	14.3
Entire Industrial Sector	7,656.0	1.18×10^{-4}	50.6	140.4	169.9

According to the occupational accidents statistics that were filled by 58.0% of the studied industrial establishments, the figures showed that about 68.1% of the occupational accidents that occurred in the industrial sectors during the past 8 years ended up with injuries or deaths.

This means that more than 50.0% of these accidents caused -besides the human and financial losses- social problems for both individuals and establishments during these years. Table (4-10) gives detailed statistics for occupational accidents, diseases, fatalities, LWDs, and the financial losses in the industrial sectors during the last 8 years. In the same vein, Appendix (2) gives detailed statistics for these items in each industrial sector.

Table (4-10): The Numbers of occupational accidents, injuries, fatalities, LWDs, and the financial losses in the Palestinian industrial manufacturing sectors in the last 8 years.

Year	No. of Fixed Employees	No. of O.As	No. of Non-Fatal O.As	No. of Fatal O.As	No. of O.Ds	No. of LWDs	Annual Financial Losses (\$)
2009	2,710	310	249	0	6	1,027	31,360
2010	3,072	268	185	0	0	589	31,360
2011	3,157	341	249	0	1	676	18,230
2012	3,232	454	297	0	3	1,091	27,180
2013	3,484	399	253	0	2	880	21,360
2014	3,664	442	294	1	8	1,103	15,015
2015	3,917	463	290	1	15	1,506	111,540
2016	4,792	433	296	2	17	2,012	65,610
Total	28,028	3,110	2,113	4	52	8,884	321,655
Average/Year	3,503.5	388.8	264.1	0.5	6.5	1,110.5	40,206.875

US-OSHA and EU-OSHA equations have been used to evaluate the OSH status in each industrial sector by finding the rates of the occupational accidents, fatalities, and losses so as to compare them to each other before comparing them to the national and international rates.

It should be strongly noted that the occupational rates that clarified and detailed in Appendix (3) are:

- ❖ The results of the OSH calculations' process that built on the basis of figures and statistics given by the industrial establishments themselves.
- ❖ Absent for Palestine in general and for these industrial sectors in particular, which promotes the need of finding them so as to determine and assess the Palestinian industrial OSH status compared to the OSH status in the neighboring Arab countries from one side, and the rest of the world from the other side.

- ❖ An unprecedented contribution that supports the Palestinian MOL and all the official and non-official institutions that are concerned about monitoring and developing the OSH reality in Palestine.

The previous table shows a large increase in the numbers of occupational accidents, injuries, and diseases through years in the industrial sectors. However, this table does not show the real impact of this increase on the OSH of employees working in the manufacturing sector. Therefore, the US-OSHA and EU-OSHA rates are vital to explain the effects and seriousness of this increase and its consequences in each industrial sector.

❖ **US/EU-OSHA Calculated Rates:**

Referring to Table (4-8), the US-OSHA calculated values and rates for the Palestinian industrial manufacturing sectors showed that for every 100 full-time employees 10.3 workers had involved in occupational accidents/diseases compared to countries like Ireland and USA with injury rates of 20 and 3.5 for every 100 full-time employees respectively (HSA, 2018; BLS, 2018). Of these 10.3 employees, 7.1 suffered lost times due to their occupational injuries/diseases. The table also showed that the average number of days lost per each occupational injury/disease is 2.8 days/ (injury/disease). On the other hand, the OSHA calculations revealed that 5.4 fatal cases occurred every 100 million labor hours in the industrial sectors. The most dangerous sectors in terms of the involvement of the employees in occupational accidents/diseases were plastic and metal industries with injury rates of 18.8 and 137 respectively. These rates say that of 100 full-time employees 18.8 of plastics and 13.7 of metals were involved in occupational

injuries/diseases. 8.0 of plastics caused loss of time compared to 13.0 for metals. Each injury in plastic industries resulted in 1.2 days of absence, while in metal industries each injury resulted in 3.2 days of absence. These figures gave a better explanation for the seriousness of occupational accidents in each industrial sector, which also interpret why an occupational injury/disease in the metal sector could be more dangerous than that in plastics even if metals' injury rate is much lower than that of plastics.

On the other hand, the figures showed that the lowest injury rates in the industrial sectors were in chemical then leather industries with injury rates of 3.2 and 1.5 respectively. In spite of having the smallest injury rates, both chemical and leather industries could be classified too dangerous sectors due to; the lost time rate workers suffer after injury, and much seriously, due to the lost days' rate that could result from each injury/disease there. In chemical industries, for every 100 full-time employees, about 86.35% of them suffered lost time due to occupational injury/disease compared to 95.4% in leather industries. The worst is that each occupational injury/disease in leather industries resulted in 13.2 lost working days for 3.3 in the chemical industry. These results prove the severity of chemical hazards in such industries in causing occupational accidents as was confirmed previously by HSE, 2015. Also, these figures gave again another explanation that even if the sector has low injury/disease rates, the consequences of these injuries/diseases should really be the ones that determine the seriousness of the industry, not the injury or lost time rates only. For example; and despite the small injury rate of leather industries compared to that of plastics, leather may be considered much dangerous due to its injuries/diseases' seriousness.

Another example could be paper industries that had an injury rate of 8.5, but with 100% lost time percentage, and with an average of 2.9 lost days for each injury. Wood and food industries which had moderate injury rates with 77.9% and 70.7% loss of time, had at the same time the second and third highest severity rates after leather industries with 6.9 and 4.7 respectively. Referring to Table (4-9), the EU-OSHA rates have strongly supported the US-OSHA rates with for sure, some differences to some extent.

According to EU-OSHA equations, per 100,000 workers, metal, paper, and plastic industries had the highest workplace injury rates with 14,418.8/ 9,329.1/ and 8,820.4 injury rates respectively. Again, chemical and leather industries had the lowest injuries rates in the industrial sectors, with 2645.9 and 1271.9 injuries per 100,000 workers respectively. The average injury rate of the Palestinian manufacturing sector according to the EU-OSHA calculations was about 7656.0 injuries per 100,000 workers. This rate is also considered very high compared to the total injury rates of countries like Egypt, the occupied Palestine or the so-called Israel, Qatar, Turkey, Belgium, Canada, and Italy whose reported injury rates between (2014-2016) were 889, 2263, 27, 1530, 1403, 1189, and 1314 injuries per 100,000 workers respectively according to ILO, 2018b. Again, these rates have once again collided with other interpreting rates like; the accidents frequency rates (AFR), and the accidents severity rates (ASR), which are directly related to the number of working days lost, or the number of absence days from work due to occupational accidents/diseases. Regarding the average number of the injuries' reoccurrences in every 1000,000 working hours in the last 8 years, plastic industries were the most dangerous followed by metal and paper

industries, which is the same result obtained by applying the US-OSHA equations. Chemical sector came last followed by leather with another consistent result. However, and regarding the accidents' severity, food industries appeared to be the most severe industrial sector followed by wood industrial sector. The last result supports Aaltonen, 1996; Hardison and Cochran, 2017 who discussed the seriousness of wool and furniture industries.

Figures (4.21) and (4.22) represent the changes in the OSH rates regarding the occupational injuries, diseases, accidents frequency rates, and the accidents' severity rates in the industrial sectors through the past 8 years.

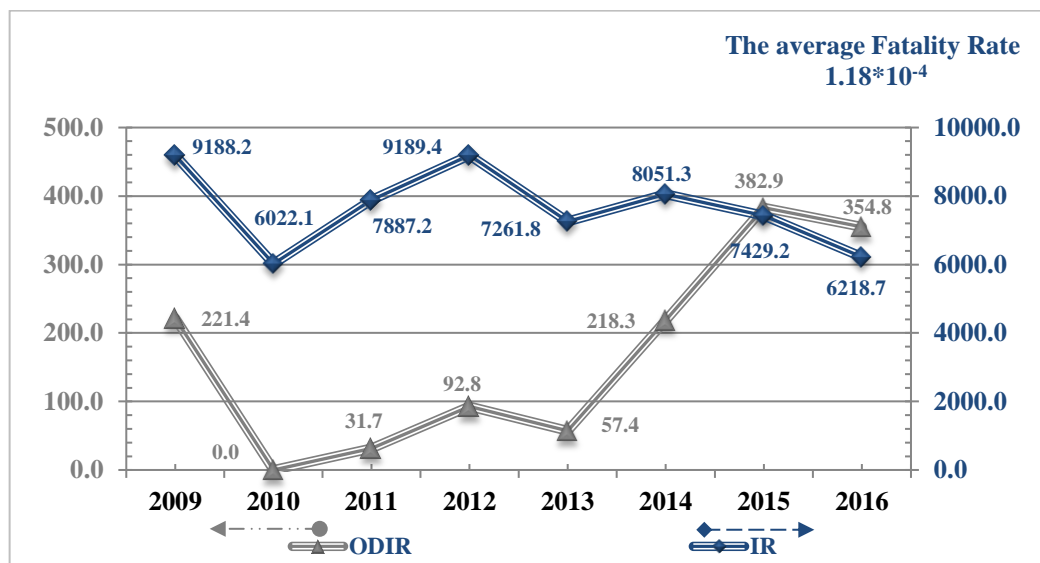


Figure (4.21): The ODIR/IR rates of the industrial sectors between the years (2009-2016).

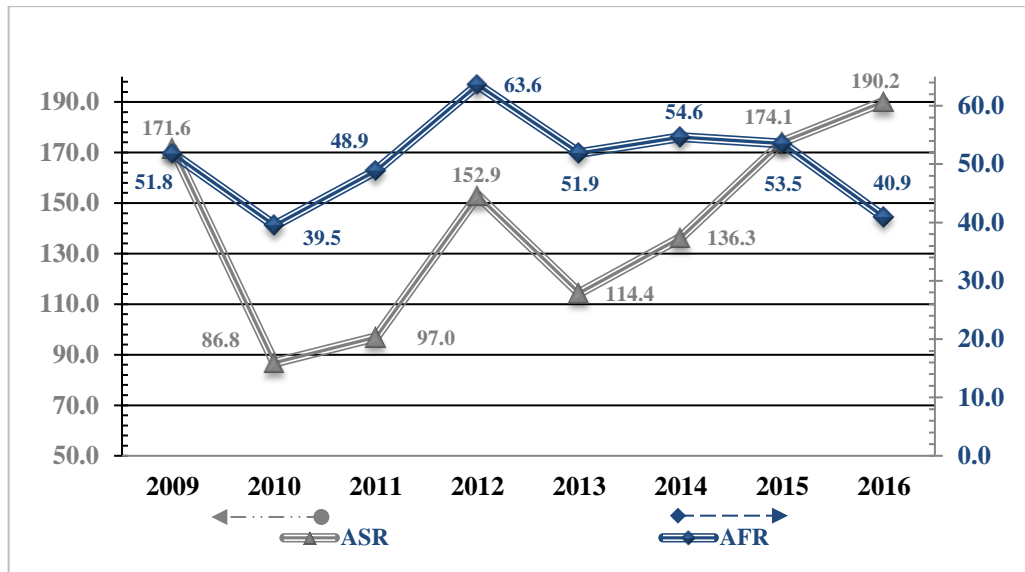


Figure (4.22): ASR/AFR rates of the industrial sectors between the years (2009-2016).

In addition to human losses, the occupational diseases and injuries have resulted in increasing financial losses for the industrial establishments besides the PICs. The maximum estimated amount of the industrial financial losses was reported in 2015 with 111,540\$ of which 60.1% of these losses were in the wood industrial sector, compared to 20.0% in food industries and 16.4% in metal industries.

✧ **The Palestinian Industrial Sectors:**

While the IR chart in Figure (4.21) of the industrial sectors shows a decreasing trend line, the ODIR chart in the same Figure shows a sharp increasing one. The trend lines reflect a general image for the main charts, but not a comprehensive detailed one. Focusing on the IR chart numbers in the previous figure illustrates this idea. The IR constantly increases and decreases each year in a way that could never be described as constant.

On the other hand, the AFR trend line in Figure (4.22) seems to be somehow constant, which could be another important indicator of the frequent

occurrences of occupational accidents. The most critical trending in these two figures as obviously appears is the increasing ASR trend line. This trend line raises fears and doubts against the increased severity of occupational injuries in the industrial sectors from one side, and against the size of losses that the industrial establishments may incur from the other side.

Nevertheless, to well understand the trending attitudes of all occupational rates in the industrial sectors, these rates should be studied and analyzed in each sector separately.

⇒ **Food & Beverages Industrial Sector**

The food industrial sector comes third in the ranking of the largest industrial sectors in Palestine. It has the second largest proportion of the Palestinian employees in the country that is estimated by 15.8% of employment, Furthermore, its contribution in the Gross Domestic Product (GDP) is about 13.0% of the Palestinian GDP, and 8.0% of the Palestinian exports (Mne.gov.ps, 2018). Although this sector is considered to be one of the most sensitive sectors in terms of public safety and health, and the OSH, it has the first highest number of occupational diseases and the second highest number of occupational accidents after metal industrial sector.

Surprisingly, food industrial sector has witnessed a significant increase in the number of occupational accidents and injuries over the past four years to put the injury rate line above the IR average line to a clear and tangible extent. See Figure (4.23a). Therefore, in terms of occupational accidents rates and its increasing trend, disease rates, and the severity rates, food sector can be considered one of the most dangerous industrial sectors in Palestine.

This result is totally compatible with (Kim, 2016) who assured in his paper that food preparations, processing, and dining services are a potentially dangerous job which occasionally leads to serious injuries. In particular, and according to the figures collected from the industrial food establishments, this sector witnessed the highest number of occupational fatalities in the past 8 years with 2 deaths cases that were classified as occupational deaths.

⇒ **Aluminum & Metallurgical Industrial Sector**

Metal and aluminum industrial sector are considered as the largest industrial sector in Palestine that provides large employment opportunities for the Palestinians and contributes to about 10.0% of the Palestinian GDP (Mne.gov.ps, 2018). After years of decline in the rates of the occupational injuries shown in Figure (4.23b), the figures in this sector have risen again to become above average with the second highest rate of occupational injuries in Palestine. Injuries in the metal sector are considered second in terms of severity and lost working times, as well as the occupational deaths with one occupational death case.

⇒ **Wood, Furniture & Mattresses Industrial Sector**

Another major industrial sector is the wood industrial sector. According to Mne.gov.ps, 2018, wood industries provide the Palestinian labor market with 8.0% of the labor force and enrich the Palestinian GDP with an estimated percentage of about 8.0%. The collected and calculated figures showed a clear reduction in the injury rates in the wood sector to a well below average rate presented in Figure (4.23c). However, this reduction does not mean that the injury rate is also low. On the contrary, despite the fact that statistics did

not uncover any occupational diseases or fatalities cases, wood industrial sector ranked fourth in terms of occupational injuries rates, and first in terms of the severity and seriousness of injuries.

⇒ **Plastic Industrial Sector**

Plastic industries are one of the most distinctive industrial sectors in Palestine. They have witnessed a significant expansion and development in recent years that may have led to a below average injury rate as shown in Figure (4.23d). However, this under average rate could be a deceptive decline as it is the highest injury rate of an industry in the country. The plastic sector has also the highest injury frequency rate, while has the fifth rank in injury severity rate. The plastic sector is one of the dangerous industrial sectors where cases of both occupational diseases and deaths have been reported.

⇒ **Leather & Shoes Industrial Sector**

The risks in the Palestinian leather industrial sector refer to its occupational diseases rates, as well as its injuries severity rates compared to those injuries occurring in the other industrial sectors. The leather industrial sector is considered the most dangerous sector in terms of severity and lost time rates. On the other hand, it is ranked third in terms of the number of the reported occupational diseases. However, the IR1 chart represented in Figure (4.23e) shows a significant increase in injury rates in this sector after the year 2012.

⇒ **Paper & Cartoon Industrial Sector**

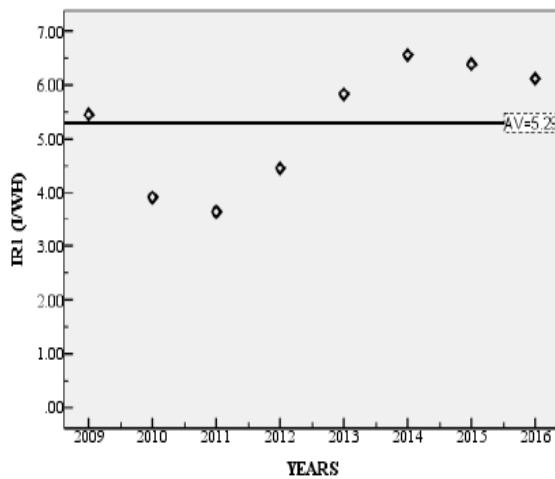
The Paper industrial sector is one of the modernized sectors in the industrial manufacturing sector in Palestine. It is also currently one of the most prevalent and prosperous sectors. Being one of the modern industries perhaps enabled it to become one of the most vulnerable to occupational injuries and diseases. Paper industrial sector ranges between the second and third rank in terms of the occupational injury rate. Furthermore, it ranks fourth in terms of occupational diseases, and fourth in terms of injuries' severity rate. Figure (4.23f), which represents the IR1 chart, shows a good enhancement in the injury rates regarding the injury rate average, which sounds good for each industrial figure, but as usual, not enough.

⇒ **Chemical Industrial Sector**

Figure (4.23g) shows another increase in the injury rates, another (above average) line, but this time in the chemical industrial sector. The small industrial sector whose contribution to the Palestinian exports is estimated at around 5.0% may not appear as dangerous as the remaining industrial sectors because of its establishments' size, its employment size, and its industrial level (Mne.gov.ps, 2018). Besides, it could be classified as one of the safest industrial sectors in the country in terms of the occupational injury rates. On the contrary of that, chemical industrial sector could be also classified as one of the most serious sectors as it has the highest occupational diseases rate on one hand, and high injury's severity rates.

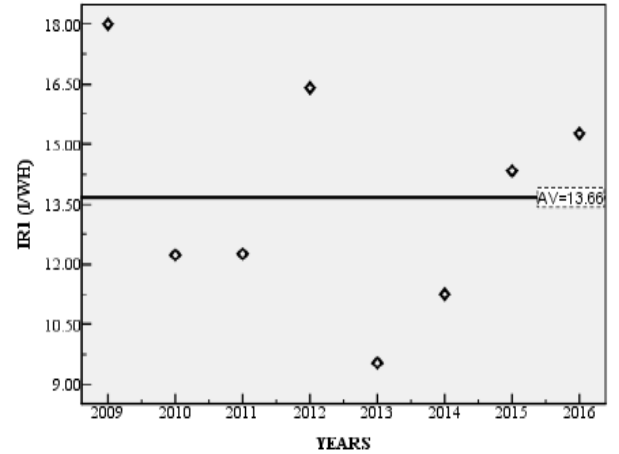
Figure (4.23) typifies the injury rates calculated by the US-OSHA equations in each industrial sector.

The following figure proves again that the decreasing trend line of the IR1 chart is not real. Especially when the IR1 chart of the industrial sector represented in Figure (4.23h) clearly shows how the injury rates continuously increasing from 2010 till 2015. The increasing trending mode in all industrial sectors but the plastic sector is another sign of proof.



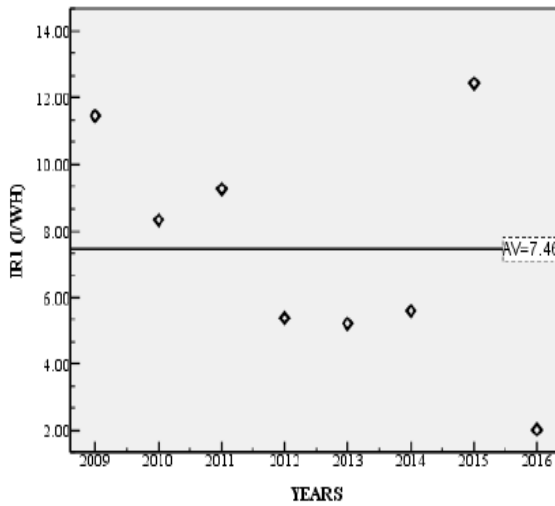
IR1 Chart for Food & Beverages Industries
(2009-2016)

(a)



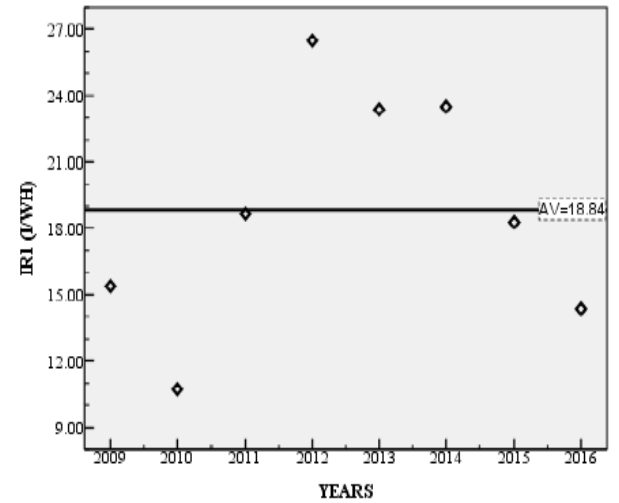
IR1 Chart for Aluminium & Metallurgical
Industries (2009-2016)

(b)



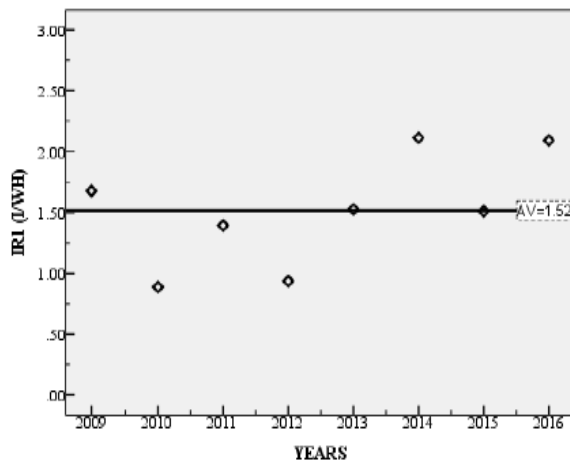
IR1 Chart for Wood & Furniture Industries
(2009-2016)

(c)



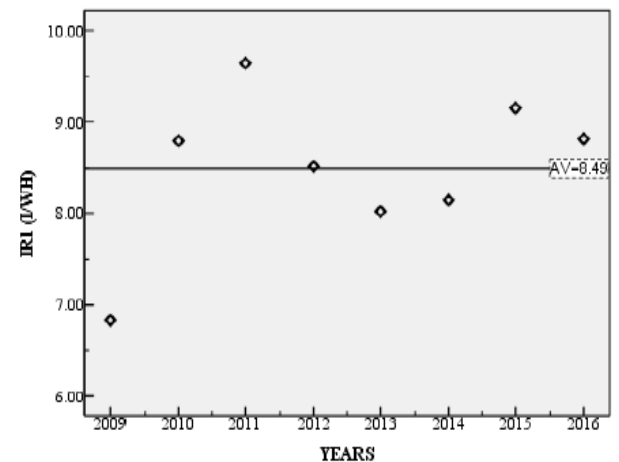
IR1 Chart for Plastic Industries
(2009-2016)

(d)



IR1 Chart for Shoes & Leather Industries
(2009-2016)

(e)



IR1 Chart for Paper & Cartoon Industries
(2009-2016)

(f)

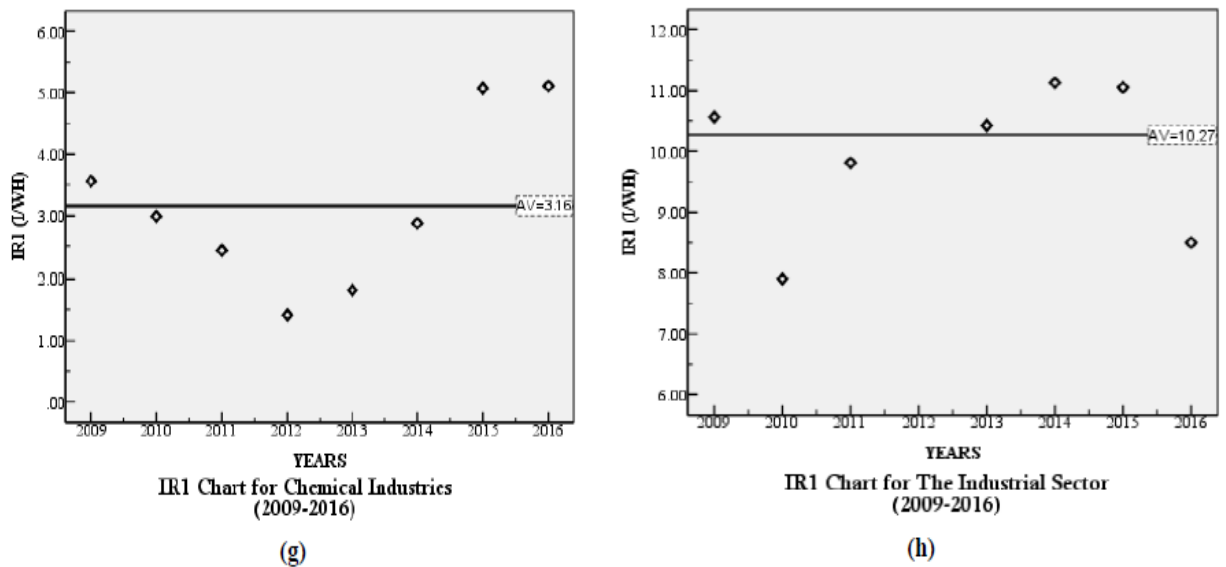


Figure (4.23): The IR1 rates (per 100 full-time workers) for each industrial sector between the years (2009-2016).

4.4.2.2 The Surveys' Results

▪ Exposed Employees

With regard to the OSH in industrial sectors, it was found that about 2,913 industrial employees are exposed to occupational risks in the eight investigated industrial sectors. Accepting the (exposed to risk) concept by employers was as troublesome and uphill as impossible. The employees' questionnaire was targeting all industrial employees who are exposed to any kind of occupational danger or risk in industrial establishments. While the majority of employers insisted that they have *zero* exposed employees, others considered their production, operation, and maintenance employees as the only exposed to risk employees. Whereas *a few*, listed their whole workforce as exposed to occupational risks. So, in order to facilitate the

process and convince the employers to determine the number of exposed employees in their establishments, they were informed that the targeted group of employees is all employees working in the manufacturing, production, technical, and finishing (Packaging) departments. Figure (4.24) shows the percentages of employees from all the participating departments of the establishments.

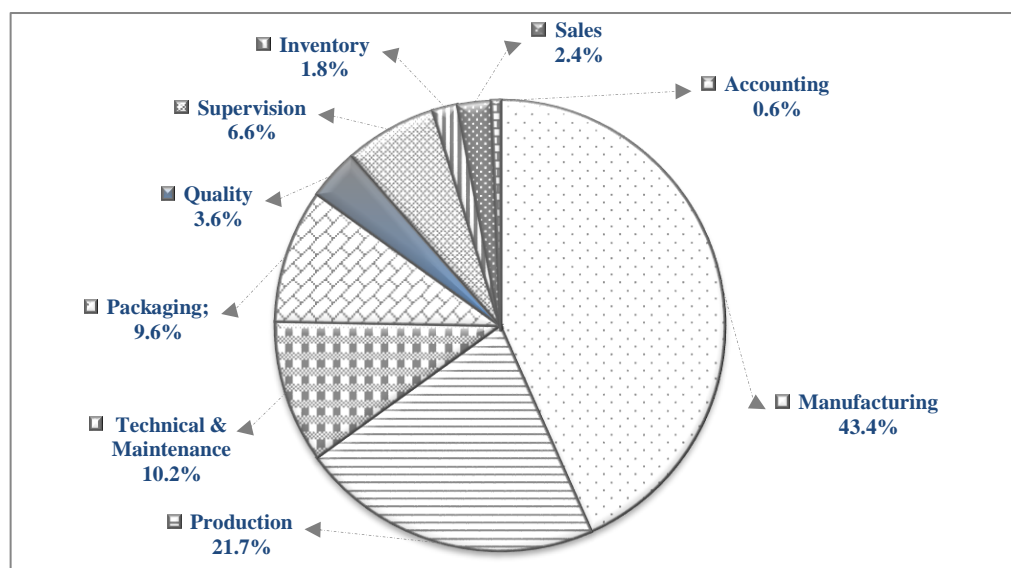


Figure (4.24): Departments' participation percentages in the employees' survey.

The workplace analysis results stated that about 35.0% of the exposed employees in these industrial sectors were under 26 years old, 2.2% of them were females. Furthermore, 69.6% of the exposed employees were having secondary certificates or less, where 10.4% of them were completely illiterates. Furthermore, about 15.0% of these employees have had a work experience estimated by 12 months or less. In the industrial establishments, 45.1% of the employment contracts of the exposed employees were temporary contracts including 4.5% of the female employees' contracts. In

addition to that, 40.0% of the exposed employees' contracts were not officially documented.

For detailed information about the exposed employees, see Figure (4.25).

Age Group Gender	Male	Female	Total
Under 15 Y/O	0.80%	0.38%	1.18%
(15-20) Y/O	3.72%	0.04%	3.76%
(21-25) Y/O	28.78%	1.77%	30.55%
(26-30) Y/O	22.26%	3.68%	25.94%
(31-35) Y/O	17.93%	1.78%	19.17%
(36-40) Y/O	9.48%	0.84%	10.32%
Above 40 Y/O	8.60%	0.48%	9.08%

Qualification Gender	Male	Female	Total
Illiterate	9.68%	0.67%	10.35%
Preparatory & less	45.88%	2.18%	48.06%
Secondary	8.90%	2.30%	11.20%
B.A	27.18%	2.18%	29.36%
M.A	1.03%	0.00%	1.03%
PhD	0.00%	0.00%	0.00%

Experience Gender	Male	Female	Total
A year & less	13.76%	0.82%	14.58%
2-4	32.43%	1.12%	33.55%
5-8	18.57%	1.39%	19.96%
9-12	12.34%	0.56%	12.90%
13-16	9.37%	0.33%	9.70%
17-20	4.00%	0.03%	4.03%
21 & more	5.28%	0.00%	5.28%

Contract Nature Gender	Male	Female	Total
Permanent	37.40%	17.50%	54.90%
Temporary	40.60%	4.50%	45.10%

Figure (4.25): General information of the exposed to risk employees in the industrial establishments.

The highest percentages of exposed employees were reported in plastic, food, and metal industrial sectors with 28.0%, 24.7%, and 23.9% consecutively, while the least percentages were in chemical, wood, and leather industrial sectors with 4.2%, 4.1%, and 4.0% consecutively.

▪ Occupational Accidents/Diseases

➤ Occupational Diseases

Regarding occupational accidents and diseases, the questionnaires statistical data represented in Figure (4.26) showed a considerable annual increasing trend in occupational accidents, injuries, fatalities, and diseases.

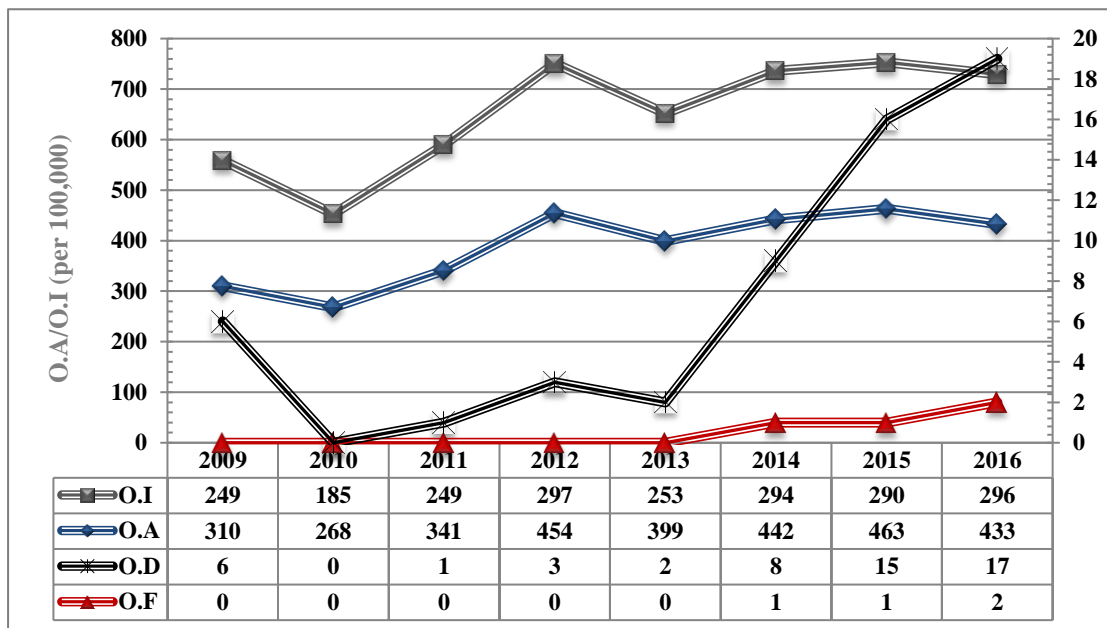


Figure (4.26): The OSH statistics in the industrial sectors between the years (2009-2016).

The questionnaires' analyzed results, specifically those with regard to the occupational accidents/diseases revealed that approximately 9.1% of the industrial establishments' employees were suffering from chronic occupational diseases. 40.0% of these employees belong to metal industries besides other 20.0% belongs to chemical industries. The results from the employees' questionnaire did not report any occupational diseases cases in plastic industries. However, the results from the workplace questionnaire confirmed that about 49.4% of the industrial establishments had at least one

occupational diseases case during 2017, with one single reported case between (6-10) occupational diseases in metal industries. The highest percentage reported in food industries with 27.9%, followed by metal and wood industries with 18.6% and 15.1% respectively. Leather industries came last with 9.3% followed by paper industries with 4.7%. Figure (4.27) shows the percentages of the occupational diseases' cases according to both the employees and the workplace questionnaires in each industrial sector.

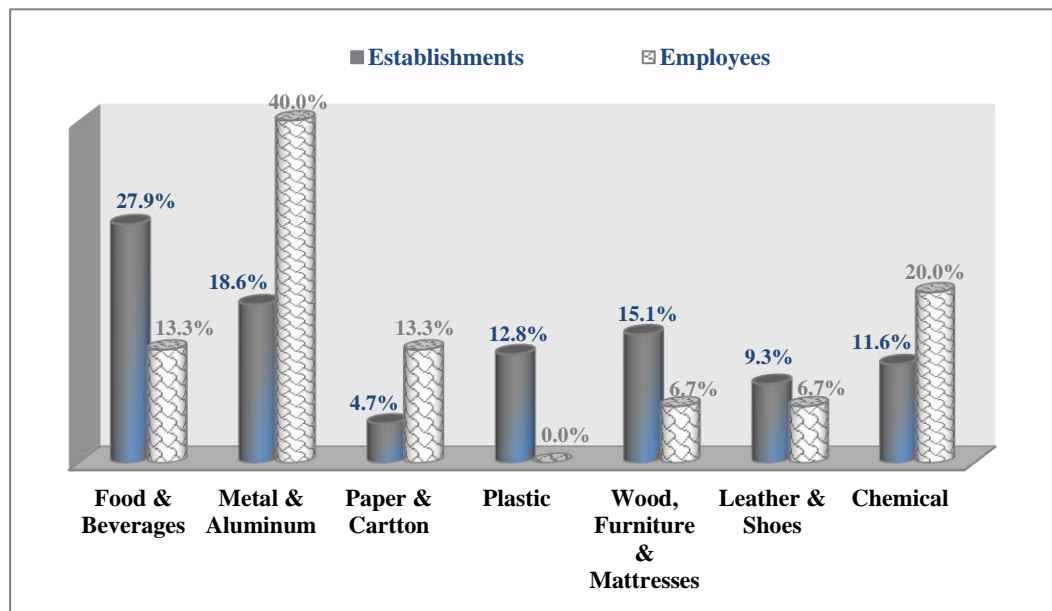


Figure (4.27): The occupational diseases' percentages per industrial sectors according to the employees and their employers.

However, for the establishments' owners, the concept of occupational diseases seems to be not clear enough. This conclusion's evidence is clear in the owners' responses obtained from the industrial establishments' statistical table included in the workplace questionnaire, where, with the exception of some logical answers, most of the diseases named in the occupational

diseases types' column were actually types of occupational accidents. Table (4-11) reflects this evidence and illustrates that almost more than 62.0% of the mentioned terms refer to occupational accidents' types.

Table (4-11): The workplace survey results for the occupational diseases types in the industrial sectors.

Industrial Sector Diseases' Types	Metal	Food	Chemical	Wood	Plastic	Paper	Leather	Total	Percentage (%)
Fractures*		2			1			3	9.3
Torn Ligament*		1						1	3.1
Back Pains		1						1	3.1
Arthritis		1						1	3.1
Wounds*	1	1			1	1	2	6	18.8
Allergy		1					1	2	6.3
Tonsillitis*			1					1	3.1
Headaches			1					1	3.1
Breathing Disorders			1		1			2	6.3
Skin Sensitivity			1					1	3.1
Burns* (Gas, Chemical)	1						1	2	6.3
Amputations & Disabilities*							2	2	6.3
Eye Injuries*							2	2	6.3
Internal Bleeding*							1	1	3.1
Bruising*						1		1	3.1
Cartilage Inflammation				1			1	2	6.3
Hernia*							1	1	3.1
Hearing Impairment	1							1	3.1
Muscular Disorders				1				1	3.1
Total	3	7	4	2	3	2	11	32	100
Percentage (%)	9.4	21.8	12.5	6.3	9.4	6.3	34.3	100	

*: Occupational injuries not chronic occupational diseases.

Figure (4.28) represents percentages of the occupational diseases types from which employees suffered in the industrial establishments according to the employees' and workplace survey analysis. Note that, the workplace figure consists of actual occupational diseases only.

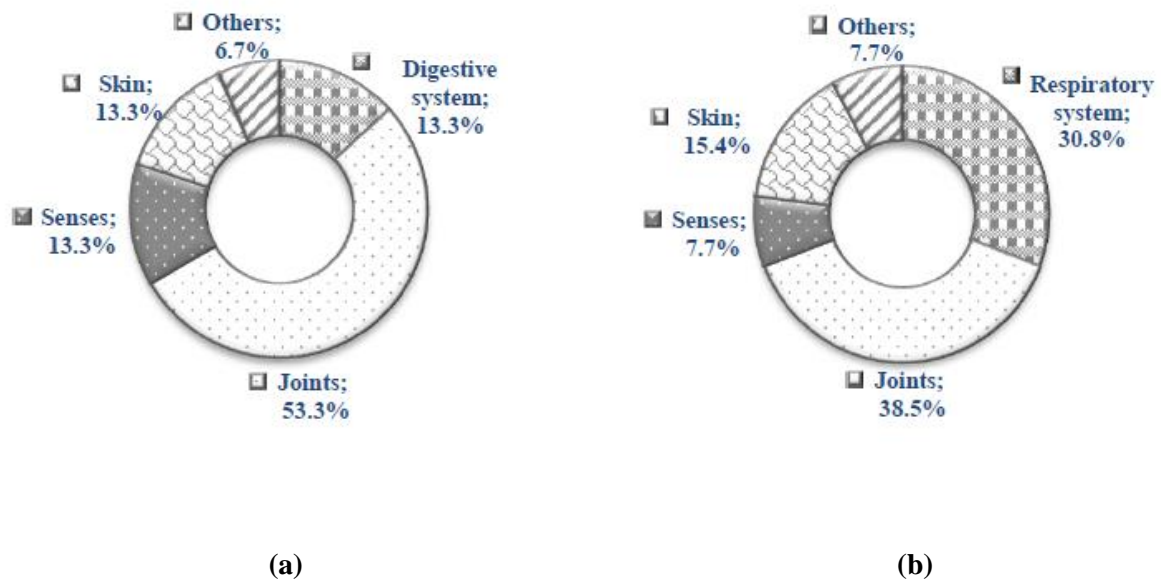


Figure (4.28): The percentages of the occupational diseases types in the industrial sectors according to (a): Employees, (b): Workplace.

The previous figure also reflects a good compatibility between the answers of employees and the establishments' owners in approximately all the occupational diseases types except the Respiratory and Digestive systems' diseases. The key determinant method to decide about differences here must be the primary and periodic medical examinations and their records, which actually do not exist. This fact also has been agreed by the industrial establishments' employees and their employers whose percentages for employees' undergoing primary and periodic medical examinations ranged from (32.4-33.5) % for primary examinations, and from (25.8-31.4) % for

periodic examinations. These low percentages of performing the important medical examinations had lower documentation percentages of 21.10% and 31.40% according to employers and their employees respectively.

➤ **Occupational Accidents**

To address occupational accidents, the statistical analysis of the workplace questionnaire has revealed that during the year 2017 about 81.0% of the surveyed industrial establishments have experienced at least one occupational accidents case. The highest reported percentage for occupational accidents was in food industrial sector at 24.7%. The second highest percentage was for metals with about 22.5%. Plastic and wood industries ranked third with 12.7%. Leather and chemical industries still ranking last with 9.9% for each sector. Uncommonly, paper industries have reported the least occupational accidents percentage with 7.7%.

87.3% of the industrial sectors have reported from (1-5) occupational accidents cases, most of them in food and metal sectors. Whilst 7.0% have reported from (6-10) occupational accidents cases most of them in food and plastic industries. On the same extent, 2.1% of the industrial establishments revealed facing about (11-15) occupational accidents. With a single reported case of (16-20) occupational accidents in plastic industries, 2.8% of the industrial establishments did admit facing more than 20 occupational accidents cases. The last percentage was obtained from food, metal, paper, and leather industries.

From the employees' side, the analysis showed that 32.3% of the industrial employees have faced occupational accidents during their working time suffering from occupational injuries. The highest percentage of employees' injuries was in metal industries with 26.2% followed by food, plastic, and wood industries with 19.7%, 16.4%, and 14.8% respectively. Paper with 9.8% and chemical with 8.2% have listed last followed by the leather industries with a percentage of 4.9%. The reasons behind the recurrence of occupational accidents according to the establishments' owners were:

- Employees' carelessness \equiv 53.8%.
- The Non-use of the OSH personal and protection tools \equiv 36.8%.
- The ignorance of using machinery \equiv 5.1%.
- Lack of arrangement and organization in the workplace \equiv 3.4%.
- The ignorance of the danger sources in the establishment \equiv 0.9%.

These percentages were not far from those claimed by the former injured employees who almost agreed with their employers adding more essential reasons as follows:

- Employees' carelessness \equiv 51.3%.
- The Non-use of the OSH personal and protection tools \equiv 16.7%.
- The ignorance of using machinery \equiv 9.0%.
- Lack of arrangement and organization in the workplace \equiv 7.7%.
- Fatigue & Exhaustion \equiv 7.7%.
- The ignorance of the danger sources in the establishment \equiv 2.6%.
- The absence of guidance and warning signs around machines \equiv 1.3%
- Another reason \equiv 3.8%.

Once again, the results pointed to low documenting percentages. About 46.3% of the industrial establishments revealed that they do *Not* have occupational injuries records, compared to 89.2% that do *Not* have occupational fatalities records.

➤ **Lost Working Days (LWDs)**

The average (lost working/off) days or the absence average due to these occupational accidents in the entire manufacturing sector was 60.2 days/accidents or nearly 2 months. The results analysis indicates that the highest average of absence days due to accidents was in food industries with an average of 96.2 days/accident followed by metal industries with an average of 85.8 days/accident. The plastic sector was another severe industry with an absence average of 81.0 days/accident. While chemical and wood industries had absence averages around 40 days/accident, the paper sector which had the lowest occupational accidents percentage, had an absence average of 48.6 days/accident. Finally, leather industries had the lowest off day's average of about 14.3 days/accidents.

➤ **Financial Losses**

In addition to the huge averages of lost working days, the industrial establishments have incurred substantial human, physical, and financial losses. Figure (4.29) summarizes these losses' percentages.

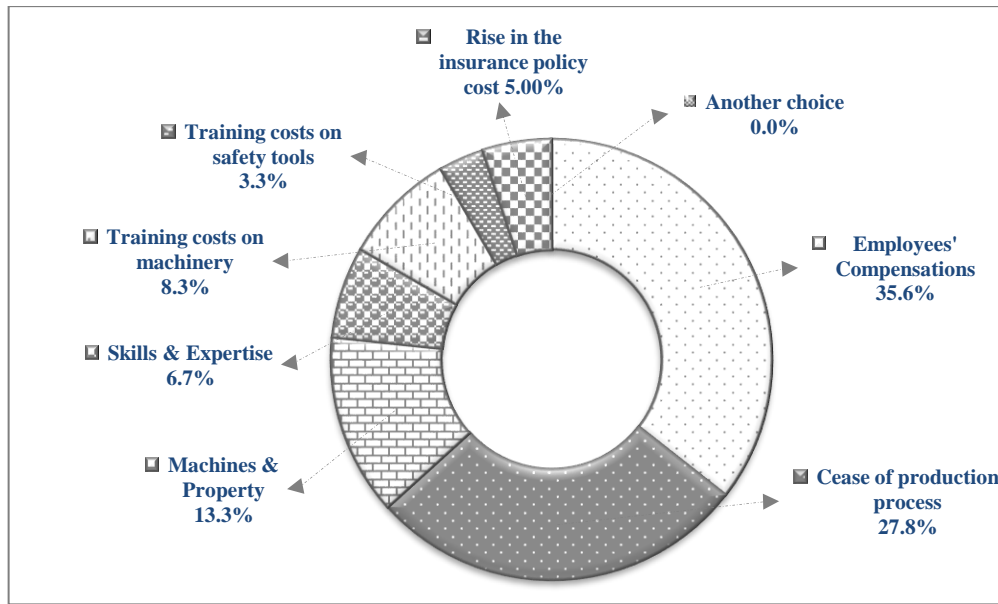


Figure (4.29): The percentages of the industrial establishments' losses due to occupational accidents.

➤ Preventive Policies

To reduce the probability of occurrence of occupational accidents and diseases, 60.4% of the industrial establishments claimed offering motivational incentives to their employees so as to encourage them to comply with the OSH laws, tools, and instructions. 58.5% of these establishments did not mention the kind of motivational incentives they offer. However, the rest 41.5% have pointed to a variety of actions of which some were considered motivational incentives, whereas the others were not.

Table (4-12) summarizes the motivating actions of the industrial employers.

Table (4-12): The industrial establishments' motivating incentives.

Motivational Incentives	Percentage
Financial and Moral rewards	30.1%
Guidance and Awareness	30.1%
Activating the OSH law	11.0%
Punishing workers	2.7%
Monitoring and Surveillance	2.7%
Maintenance of machinery	5.5%
Improving the OSH system	4.1%
Training Courses	13.7%

Although 54.3% of the industrial employees denied receiving motivational incentives neither for their commitment to OSH laws nor for reducing occupational accidents, the remaining 45.7% insisted on the existence of motivational incentives. Furthermore, according to these employees, the types of motivational incentives offered to them were; financial rewards by 36.9%, promotions, and bonuses by 28.6%, trips and vacations by 21.4%, as well as moral rewards by 13.1%. Figure (4.30) shows the distribution of the most rewarding sectors according to employers and employees.

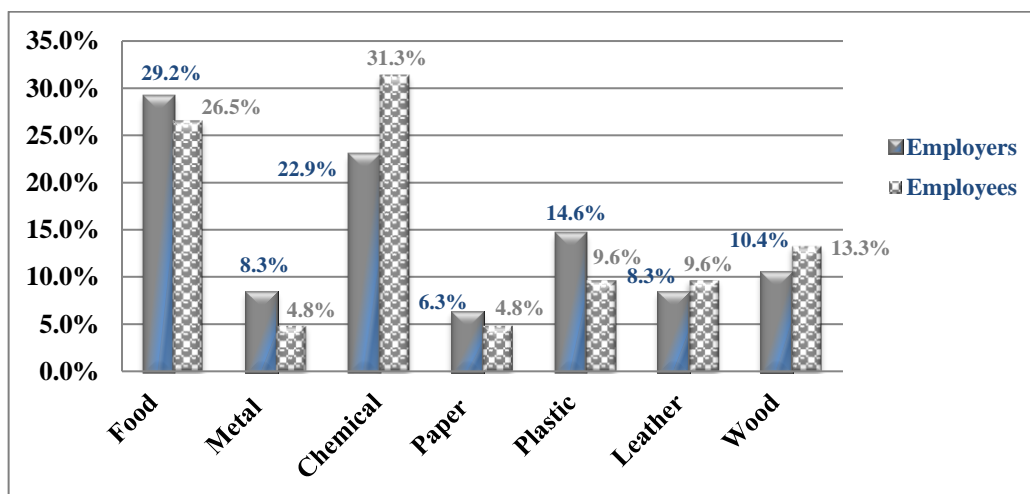


Figure (4.30): The distribution of most rewarding sectors according to the employees and their employers.

Besides motivational incentives, the results showed that 82.9% of the industrial establishments were concerned to develop OSH strategies to prevent future occupational accidents and diseases. In the same vein, 75.8% of the employers and 84.7% of the employees assured that their industrial establishments have performed many corrective actions post the occupational accidents in order to prevent their reoccurrences. While approximately 49.0% of the industrial establishments did *Not* mention their corrective actions, the reactions of the remaining 51.0% focused on:

- ✓ Enhancing the OSH procedures and tools, and enforce controls and monitoring \equiv 23.3%.
- ✓ Investigating the accidents' causes to avoid them in future \equiv 5.6%.
- ✓ Applying preventive procedures \equiv 13.3%.
- ✓ Eliminating the accidents' causes \equiv 8.9%.
- ✓ Training the employees \equiv 10.0%.
- ✓ Awareness and guidance of employees \equiv 38.9%.

However, the training percentage seems to be very low in accordance with corrective actions. Nevertheless, training courses were suggested to be used as another preventive methodology. It was mentioned previously in this chapter (Refer to Sec. 4.3.2.4) that the analysis results obtained from the workplace and employees' questionnaires data showed that the percentages of the training were (41.2%, 26.7%) consecutively. Most of these courses were held in food industries with 34.3% compared to 21.4% in metals. With equal percentages of 11.4%, both chemical and leather sectors ranked third with a slight step up from wood industries, which ranked fourth with 10.0%. The least active sector in holding training courses was paper industries with

8.6% followed by plastics with a percentage of 2.9%. Figure (4.31) summarizes the percentages of the training courses conducted by employers and taken by employees.

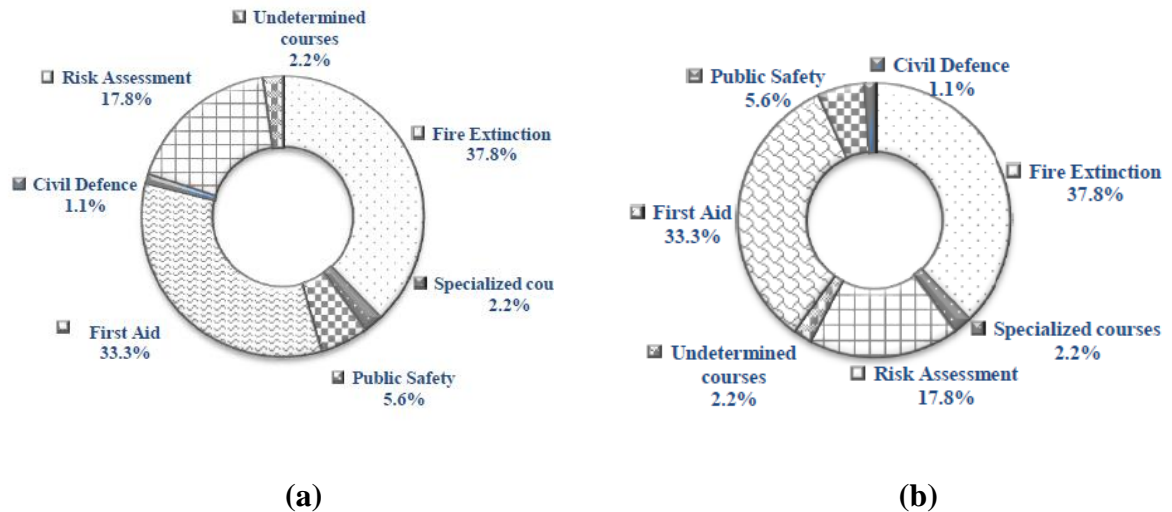


Figure (4.31): The percentages of OSH training courses in industrial establishments according to (a): Employees, (b): Workplace.

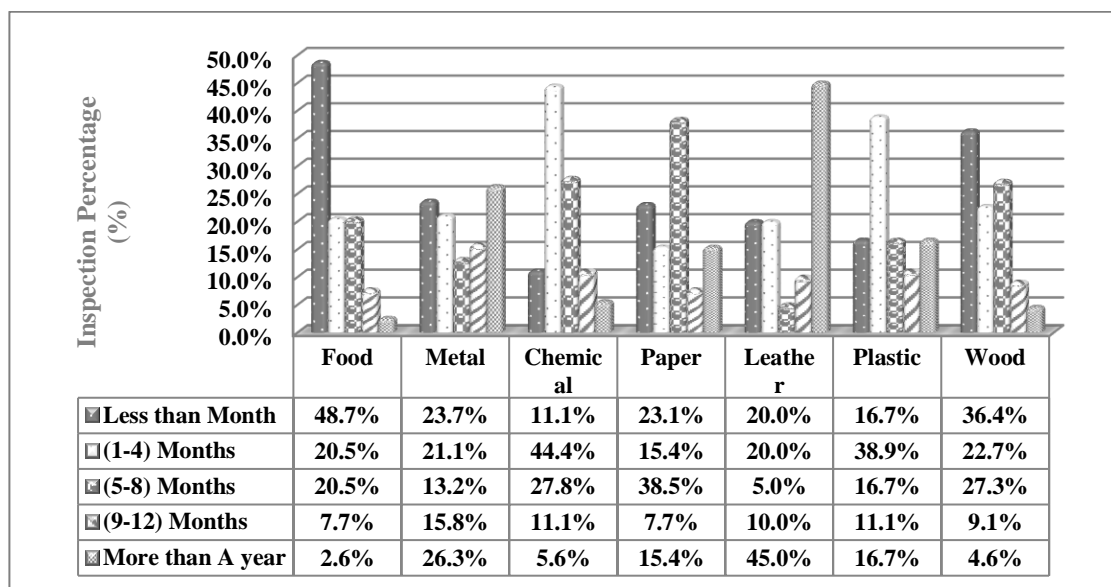
➤ External Investigation & Inspection

As for the external official inspection of the OSH conditions in the industrial establishments, the workplace results revealed that 89.9% of the industrial establishments have been investigated by competent official bodies recently. The employees' analysis results were almost consistent with the employers' ones, regarding the external inspection. With 85.6%, the employees confirmed that their establishments were subjected to inspection by government officials. Table (4-13) mentions the official entities that were responsible for these investigation processes, as well as their percentages in inspection participation.

Table (4-13): The inspectors' participation percentages.

Official Inspector Respondent	Employers	Employees
MOL	29.5%	25.1%
MOH	13.0%	17.7%
CD	46.8%	30.2%
MNE	2.2%	14.3%
MOE	1.4%	12.7%
Others	7.2%	0.0%

According to both surveys' results - employers and employees -, the highest inspection percentages were in food and metal industries with (25.0%, 27.2%) and (19.1%, 23.4%) respectively. The lowest inspection percentage was in paper industries with (9.2%, 7.0%). The analysis results revealed that about 58.8% of the industrial establishments have been investigated by officials once or never, against 8.2% were subjected to more than 5 times inspection. In addition to another 33.0% have reported about (2-4) times of inspection. Figure (4.32) details the percentages of the last time conducted inspection for all industrial sectors.

**Figure (4.32):** Last time inspection processes for industrial sectors.

These inspection processes resulted in only 2 establishments' closure cases, one in food industries whilst the other in wood industries.

4.5 Results Discussion

4.5.1 Introduction

The Palestinian industrial sectors suffer from the increasing number of occupational accidents and diseases daily (Atturk & Abu-Arra, 2014). The results obtained from each phase of this thesis methodology proved this increasing trend in the occupational accidents/diseases rates, and their severity rates in almost every industrial sector during the last eight years. Furthermore, the results analysis highlighted the problems, contradictions, deficiencies, and losses incurred by occupational accidents. ILO statistics for 2015 in relative to safety and health at work, pointed to an occupational injury rate of 1,178 (per 100,000) in Palestine (ILO, 2018b). However, the OSH equations applied to the data collected from 175 Palestinian industrial establishments resulted in a much higher injury rate for manufacturing only, as well as uncovered a lot of hidden or unnoticed problems in relative to OSH. The average injury rate in the Palestinian manufacturing industries during the past eight years was 7,656.0 (per 100,000 workers) / 10.3 (per 100 full-time workers). The manufacturing injury rate of 2016 was 6,218.7 (per 100,000 workers) / 8.5 (per 100 full-time workers). On a more serious vein, the average fatality rate (FR) was 12×10^{-4} with 42×10^{-4} (per 100 full-time workers) for 2016, whilst the average fatality accident rate (FAR) was 5.4 (per 1000 workers) with 18.9 for 2016 only. On the one hand, these rates

confirm the existence of the OSH problem in Palestine in general, and in the manufacturing sector in particular. On the other hand, comparing these rates with that published by ILO brings back to mind the poor documentation systems, and the incompatible published statistics by all different entities regarding the occupational accidents. In comparison with other developing and developed countries, Palestine has one of the highest injury rates in general, and in manufacturing in particular. Figure (4.33) compares the calculated Palestinian manufacturing injury rate with the total injury rates of other national and international countries according to ILO, 2018b.

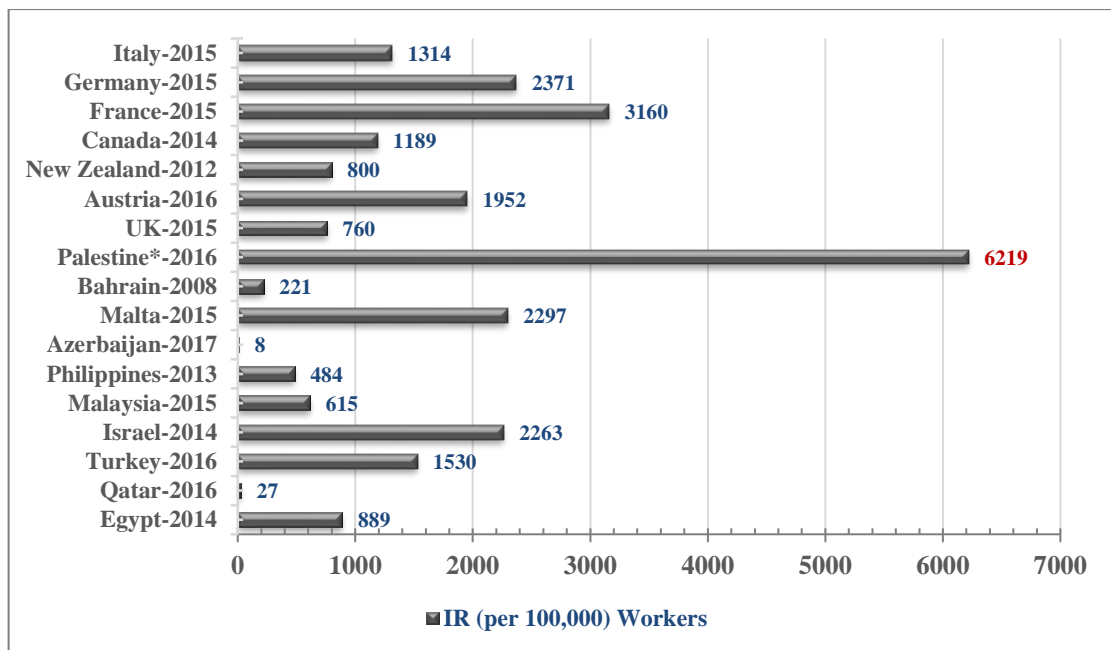


Figure (4.33): The occupational injury rates (per 100,000) workers in Palestinian manufacturing industries compared to those of the number of national and international countries.

*: The calculated injury rate for the Palestinian industrial sector in 2016.

Using observations, reports, and results' analysis support, determining the severity of the industrial sectors, explaining the OSH correlation between dependent/independent OSH variables, and interpreting the Palestinian OSH status in relative to safety ingredients are the objectives of the next coming sub-sections.

4.5.2 Severity of Industrial Sectors

The analysis of both OSH calculations and the questionnaires proved the severity of the Palestinian industrial sectors. While the injuries rates classified plastic, metal, and paper industries as the most dangerous sectors, the fatalities rates tipped to food, metal, and plastic. Regarding occupational diseases, the occupational diseases incident rates consider chemical, food, and leather as the most severe industrial sectors. Each of these international indicators measures the severity of the industry according to its important factors, either accidents, fatalities or lost time. Nevertheless, these are not the only indicators that can measure the severity of the industry. According to ILO, occupational accidents are workplace accidents that lead to injured or fatal victims and at least 3 consecutive lost working days, excluding the day of the accident. This definition assures that accidents without lost days are not severe accidents (Venkataraman, 2008). Therefore, AFR and ASR were used in the OSH calculations to decide with regard to the seriousness of the Palestinian industrial sectors. Although the AFR, ASR indicators have various calculating methods differ from one country to another, both indicators depend on the total number of worked labor hours. AFR ranked plastic industries first with regard to the number of lost time accidents, whilst

ASR ranked wood industries first with regard to the number of lost working days. Despite the fact that AFR and ASR are considered as prominent worldwide safety performance indicators for evaluating the OSH of industrial establishments, this dissimilarity in choice justifies the necessity of using other OSH indicators or finding a universal formula that can be used as a benchmark, as well as help decision makers in relative to OSH. Because the injuries' seriousness is valued with the number of lost working days resulted from them, (Frequency Severity Index) FSI and (Safety Performance Factor) SPF were applied. SPF represented by Eq. (4.1) is based on the number of working hours/days lost due to each occupational accident, regardless of its severity (Venkataraman, 2008). On the other hand, FSI represented by Eq. (4.2) is a combined formula for both AFR and ASR that gives a combined effect of accidents/injuries happened and the corresponding working days lost. This indicator reflects more obvious image for the OSH status on sectors and establishments. A Higher FSI means higher loss due to accidents and working days loss associated to them (Chacko & Gopinadhan, 2016).

Safety Performance Factor:

$$SPF = \frac{\text{Total working hours lost}}{\text{Total number of incidents}} \quad \dots \text{Eq. (4.1)}$$

Frequency Severity Index:

$$FSI = \frac{\sqrt{(AFR \times ASR)}}{1000} \quad \dots \text{Eq. (4.2)}$$

The results of FSI that shown in Appendix (4), confirmed that metal, plastic, wood, and paper industries were the industrial sectors that experienced most losses due to occupational accidents and working days lost during the past

eight years with FSI averages of 3.97, 2.97, 2.87, and 2.24 respectively. On the contrary, leather industries were the least losing sector with FSI average of 0.8 followed with chemical industries with FSI average of 0.5. The trends of the FSI indicators of the industrial sectors between the years (2009-2016) were slightly increasing. On the contrary, they give random indicating values that reflect the OSH randomness and floundering in the Palestinian industrial sectors. Nevertheless, this randomness was much closer to an increasing trend, which doubles the problem. The average FSI value of the industrial sector was 2.6, which is considerably high. Figure (4.34) shows the FSI values of the industrial sectors in the past 8 years.

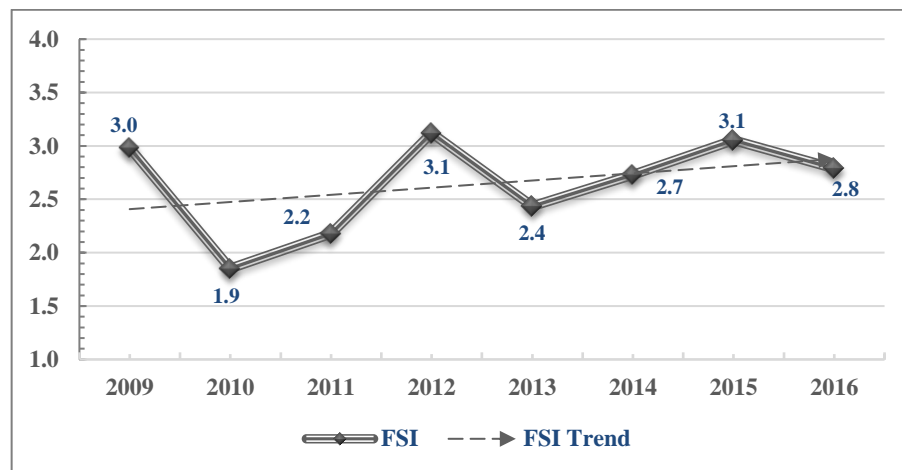


Figure (4.34): The FSI indicators for the Palestinian industrial sectors between the years (2009-2016).

According to SPF calculations, the Palestinian manufacturing sector has an average SPF that estimated with 23 lost days per each occupational accident. This average shed the light on the severity of this industrial sector which classified as one of the most dangerous sectors for employees, given the frequency and severity of occupational accidents (Silvestri et al., 2012), and as the fourth severe sector after construction, transportation, and agriculture,

forestry and fishing according to Anderson et al., 2013. The results of SPF that detailed in Appendix (4), illustrate the number of working days lost per every occupational accident in each industrial sector. Leather industries had the highest number of lost working days with an average SPF of 145.6 working days lost/occupational accident. Wood and food industries came second and third with an average SPF of (55.1, 40.7) working days lost/occupational accidents. Despite having the second highest FSI, plastic industries had the lowest number of lost working days with an average SPF of 9.8 working days lost/occupational accidents. The Palestinian manufacturing sectors have been witnessing an increased number of lost working days for the last five years. This increase is a real serious indicator of the severity of the Palestinian industrial sectors and the severity of industrial occupational accidents. The SPF average of the industrial sectors was 22.5 working days lost/occupational accident, which is also a considerably high indicator. Figure (4.35) shows the SPF values of the industrial sectors in the past 8 years.

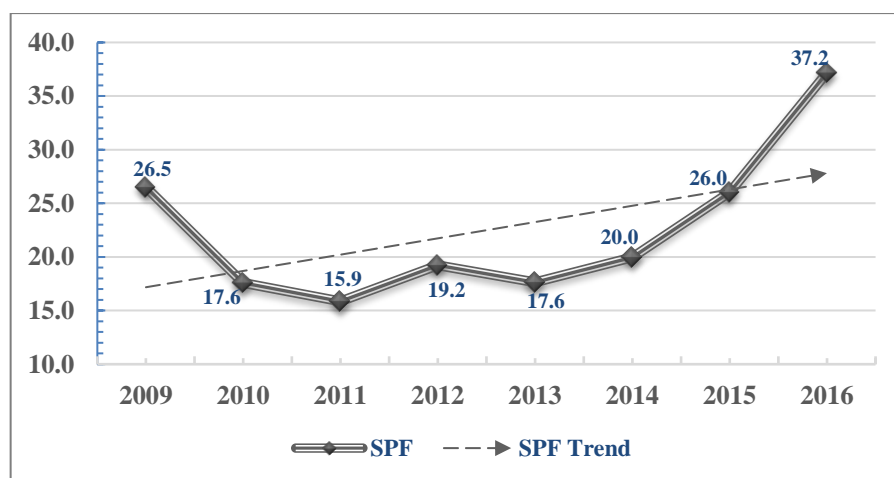


Figure (4.35): The SPF indicators for the Palestinian industrial sectors between the years (2009-2016).

Reliance on AFR and ASR to evaluate the OSH performance of the industrial sectors was definitely not enough to reflect a clear image of the OSH status in the industrial sector.

FSI helped in classifying the Palestinian industrial sectors in accordance with their severity. See Figure (4.36). This classification could be considered a very important contribution to decision makers, employees, and OSH stakeholders, especially for PICs. While employees could benefit from this classification by seeking their rights either with higher salaries, more OSH protection tools, better insurance terms, or less working hours, PICs could be able to reevaluate their insurance policies of the industrial sectors, as well as re-identify their tariff so as to fit with the severity of the industrial sector. This advantage will bring back great benefits to PICs, establishments' owners, and mostly to the society. Raising the tariff of the severe industries will force the establishments' owners to provide all necessary OSH tools and follow up their employees' commitment toward using these tools. This will definitely reduce the occupational accidents and the annual financial losses incurred by PICs due to these accidents.

SPF on the other side explored the sectors with the most severe effects with regard to lost working days. See Figure (4.37). This could help the OSH officials to make their efforts in investigating the occupational accidents in these sectors, and determining their causes so as to improve and monitor the OSH conditions there, as well as prevent the occurrences of such accidents in the future.

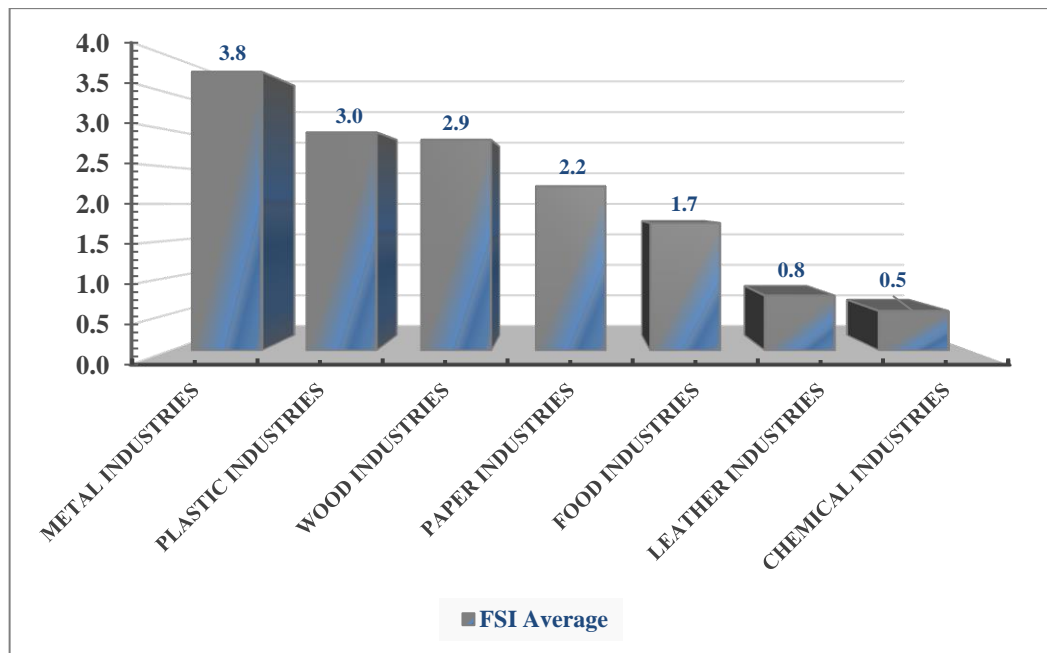


Figure (4.36): The severity classification of the Palestinian industrial sectors according to the FSI indicator.

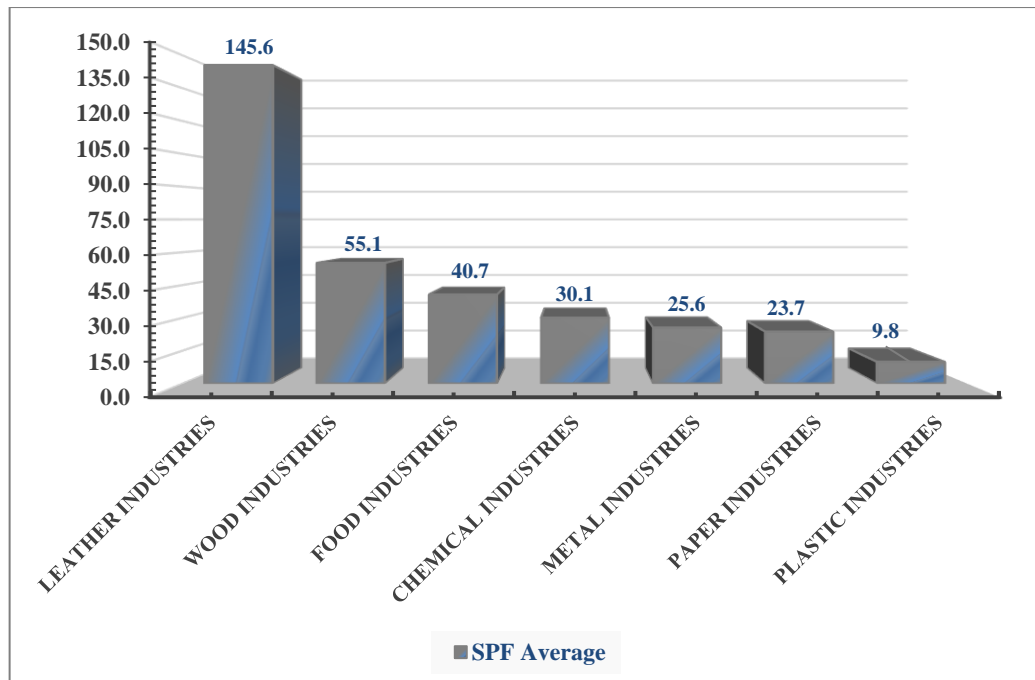


Figure (4.37): The average number of working days lost per occupational accident in the Palestinian industrial sectors according to SPF indicator.

4.5.3 OSH Correlations

Exploring the statistical correlations using Pearson's chi-squared test (χ^2) between OSH dependent and independent variables, is another way to interpret the resulted percentages. Furthermore, it should be noted that the dependent and independent variables will be determined for each case separately as some variables could be treated as both dependent and independent. Also, it is necessary to mention that all cases were tested with a unified significant level: $(\alpha) \leq 0.05$.

Note that a rejected hypothesis means that a chi-square test was performed and no relationship was found between the OSH variables or that there is no statistical evidence about a significant relationship between these OSH variables. On other hand, an accepted hypothesis means A chi-square test was performed and A relationship was found between the OSH variables or that there is a statistical evidence of 95% confidence about a significant relationship between these OSH variables.

✧ Case Correlation (1)

This case explores the correlations between occupational accidents/injuries/diseases as (**Dependent Variables**), and: the industrial sector, OSH requirements, lost working hours/days, OSH training courses, employees' commitment follow up, OSH strategies, and Establishments' motivational incentives as (**Independent Variables**).

i. Occupational Accidents

The test hypotheses were:

H1: There is no correlation between the type of the industrial sector and the number of occurring occupational accidents.

H2: There is no correlation between the existence of the OSH requirements and the number of occurring occupational accidents.

H3: There is no correlation between providing OSH training courses and the number of occurring occupational accidents.

H4: There is no correlation between the number of lost working days/hours and the number of occurring occupational accidents.

H5: There is no correlation between the employees' commitment follow up and the number of occurring occupational accidents.

H6: There is no correlation between developing OSH strategies and the number of occurring occupational accidents.

H7: There is no correlation between providing motivational incentives and the number of occurring occupational accidents.

ii. Occupational Injuries

The test hypothesis is:

H8: There is no correlation between the type of the industrial sector and the number of occupational injuries.

H9: There is no correlation between the existence of the OSH requirements and the number of occupational injuries.

H10: There is no correlation between providing OSH training courses and the number of occupational injuries.

H11: There is no correlation between the number of lost working days/hours and the number of occupational injuries.

H12: There is no correlation between the employees' commitment follow up and the number of occupational injuries.

H13: There is no correlation between developing OSH strategies and the number of occupational injuries.

H14: There is no correlation between providing motivational incentives and the number of occupational injuries.

iii. Occupational Diseases

The test hypothesis is:

H15: There is no correlation between the type of the industrial sector and the number of occurring of occupational diseases.

H16: There is no correlation between the existence of the OSH requirements and the number of occurring of occupational diseases.

H17: There is no correlation between providing OSH training courses and the number of occurring of occupational diseases.

H18: There is no correlation between the number of lost working days/hours and the number of occurring of occupational diseases.

H19: There is no correlation between the employees' commitment follow up and the number of occurring of occupational diseases.

H20: There is no correlation between developing OSH strategies and the number of occurring of occupational diseases.

H21: There is no correlation between providing motivational incentives and the number of occurring of occupational diseases.

Table (4-14) illustrates the values of the correlation coefficients, and the results of the hypotheses' tests.

Table (4-14): Correlation Coefficients and hypotheses testing decisions for case correlation (1).

Hypothesis	df	Pearson (χ^2)	Sig. (p)	Decision
H1	28	34.91	0.17	Rejected
H2	4	6.15	0.19	Rejected
H3	4	7.21	0.13	Rejected
H4	24	73.82	< 0.001	Accepted
H5	4	21.77	< 0.001	Accepted
H6	4	5.43	0.25	Rejected
H7	4	3.78	0.44	Rejected
H8	28	29.63	0.38	Rejected
H9	4	7.03	0.13	Rejected
H10	4	5.24	0.26	Rejected
H11	24	60.68	< 0.001	Accepted
H12	4	15.89	0.003	Accepted
H13	4	2.01	0.72	Rejected
H14	4	3.78	0.44	Rejected
H15	7	4.86	0.68	Rejected
H16	1	8.77	0.003	Accepted
H17	1	0.66	0.42	Rejected
H18	6	20.49	0.002	Accepted
H19	1	8.77	0.003	Accepted
H20	1	5.76	0.02	Accepted
H21	1	1.55	0.21	Rejected

Figure (4.38) summarizes the correlations of the case (1) and the accepted hypothesis.

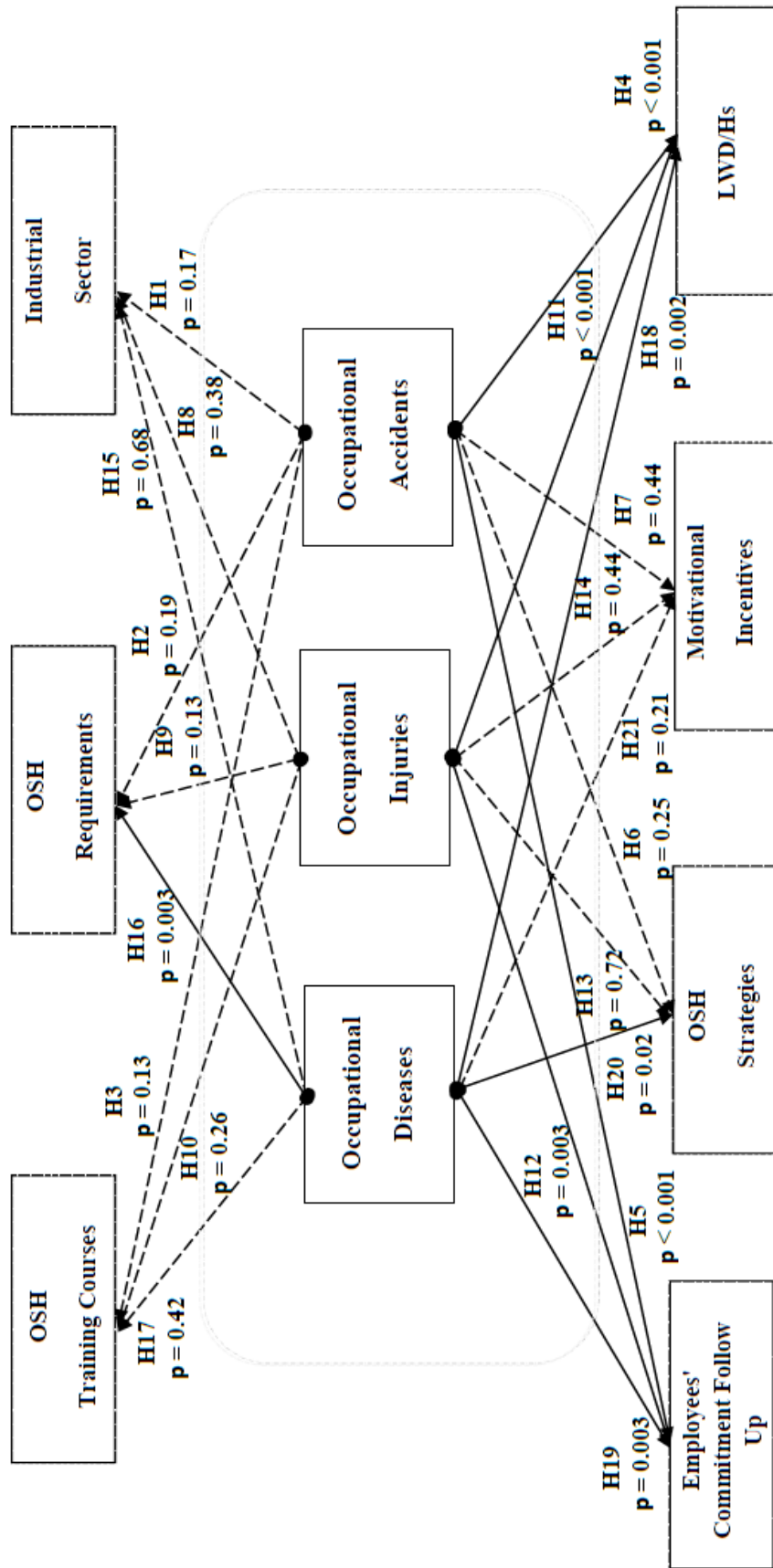


Figure (4.38): The presentation of Case correlation (1) and its hypotheses testing.

✧ **Case Correlation (2)**

Case (2) explores the correlations between the industrial sector as an **(Independent Variable)**, and: the exposure to risk, the lost working days/hours, OSH requirements, OSH strategies, external cooperation, external investigation, OSH training courses, establishments' incentives, employees' follow up, and insurance as **(Dependent Variables)**.

i. The industrial sector

The test hypotheses were:

H1: There is no correlation between the nature of the industrial sector and exposure to risk.

H2: There is no correlation between the nature of the industrial sector and providing the OSH requirements.

H3: There is no correlation between the nature of the industrial sector and the number of insured employees.

H4: There is no correlation between the nature of the industrial sector and the number of lost working days/hours.

H5: There is no correlation between the nature of the industrial sector and the employees' follow up.

H6: There is no correlation between the nature of the industrial sector and the motivational incentives.

H7: There is no correlation between the nature of the industrial sector and the number of external investigation's time.

H8: There is no correlation between the nature of the industrial sector and developing OSH strategies.

H9: There is no correlation between the nature of the industrial sector and external cooperation.

H10: There is no correlation between the nature of the industrial sector and offering OSH training courses.

While Table (4-15) illustrates the values of the correlation coefficients, and the results of the hypotheses' tests, Figure (4.39) summarizes the correlations of the case (2) and the accepted hypothesis.

Table (4-15): Correlation Coefficients and hypotheses testing decisions for case correlation (2).

Hypothesis	df	Pearson (χ^2)	Sig. (p)	Decision
H1	283	255.52	0.21	Rejected
H2	7	6.27	0.51	Rejected
H3	49	58.92	0.16	Rejected
H4	42	31.69	0.88	Rejected
H5	7	8.50	0.297	Rejected
H6	7	11.70	0.11	Rejected
H7	28	24.95	0.63	Rejected
H8	7	4.68	0.70	Rejected
H9	7	12.57	0.08	Rejected
H10	7	13.71	0.06	Rejected

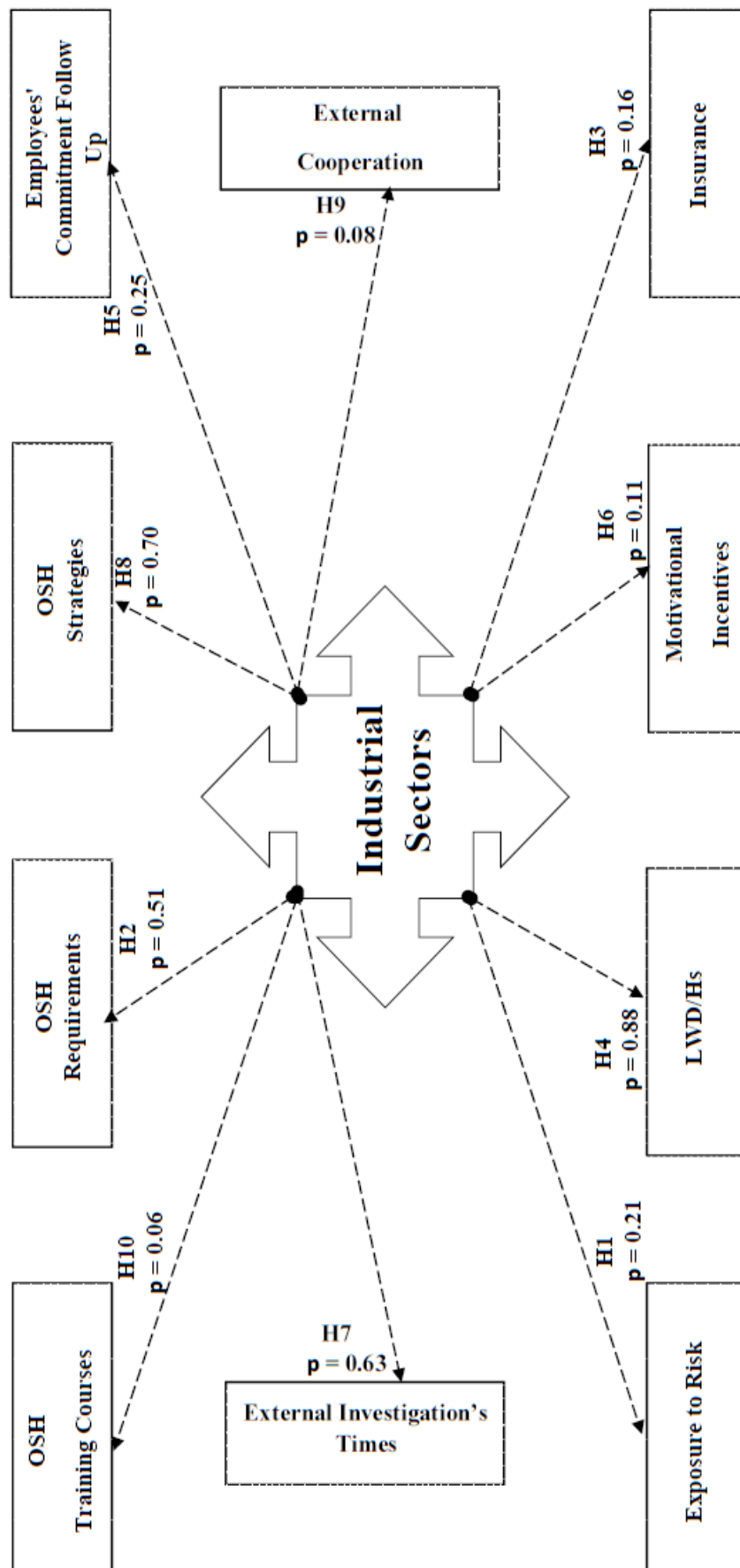


Figure (4.39): The presentation of Case correlation (2) and its hypotheses testing.

Note that:

● : Hypotheses rejected, positive correlation.

✧ **Case Correlation (3)**

This case explores the correlations between the employees' injuries and diseases as (**Dependent Variables**), and: the employees' age, qualification, experience, contract type, working hours, working days, exposure to risk, industrial sector, OSH requirements, OSH training courses, and the motivational incentives as (**Independent Variables**).

i. Employees' Injuries

The test hypotheses were:

H1: There is no correlation between the type of the employee's injuries and his age.

H2: There is no correlation between the existence of the employee's injuries and his qualification.

H3: There is no correlation between the employee's injuries and the industrial sector.

H4: There is no correlation between the employee's injuries and his experience.

H5: There is no correlation between the employee's injuries and his contract type.

H6: There is no correlation between the employee's injuries and working hours.

H7: There is no correlation between the employee's injuries and working days.

H8: There is no correlation between the employee's injuries and exposure to risk.

H9: There is no correlation between the employee's injuries and having OSH tools.

H10: There is no correlation between the employee's injuries and get OSH training courses.

H11: There is no correlation between the employee's injuries and establishments' incentives.

ii. Employees' Diseases

The test hypothesis is:

H12: There is no correlation between the type of the employee's diseases and his age.

H13: There is no correlation between the existence of the employee's diseases and his qualification.

H14: There is no correlation between the employee's diseases and the industrial sector.

H15: There is no correlation between the employee's diseases and his experience.

H16: There is no correlation between the employee's diseases and his contract type.

H17: There is no correlation between the employee's diseases and working hours.

H18: There is no correlation between the employee's diseases and working days.

H19: There is no correlation between the employee's diseases and exposure to risk.

H20: There is no correlation between the employee's diseases and having OSH tools.

H21: There is no correlation between the employee's diseases and getting OSH training courses.

H22: There is no correlation between the employee's diseases and establishments' incentives.

Table (4-16) illustrates the values of the correlation coefficients, and the results of the hypotheses' tests, whereas Figure (4.40) summarizes the correlations of the case (3) and the accepted hypothesis.

Table (4-16): Correlation Coefficients and hypotheses testing decisions for case correlation (3).

Hypothesis	df	Pearson (χ^2)	Sig. (p)	Decision
H1	6	18.28	0.006	Accepted
H2	4	5.24	0.26	Rejected
H3	7	7.61	0.37	Rejected
H4	3	5.08	0.17	Rejected
H5	1	0.08	0.77	Rejected
H6	7	8.69	0.28	Rejected
H7	5	6.00	0.31	Rejected
H8	1	2.58	0.11	Rejected
H9	1	1.54	0.21	Rejected
H10	1	0.74	0.39	Rejected
H11	1	0.10	0.92	Rejected
H12	6	14.54	0.02	Accepted
H13	4	1.05	0.90	Rejected
H14	7	6.53	0.48	Rejected
H15	3	10.81	0.01	Accepted
H16	1	0.05	0.82	Rejected
H17	6	12.54	0.05	Rejected
H18	4	19.61	0.001	Accepted
H19	1	20.23	< 0.001	Accepted
H20	1	0.04	0.84	Rejected
H21	1	0.03	0.86	Rejected
H22	1	3.23	0.07	Rejected

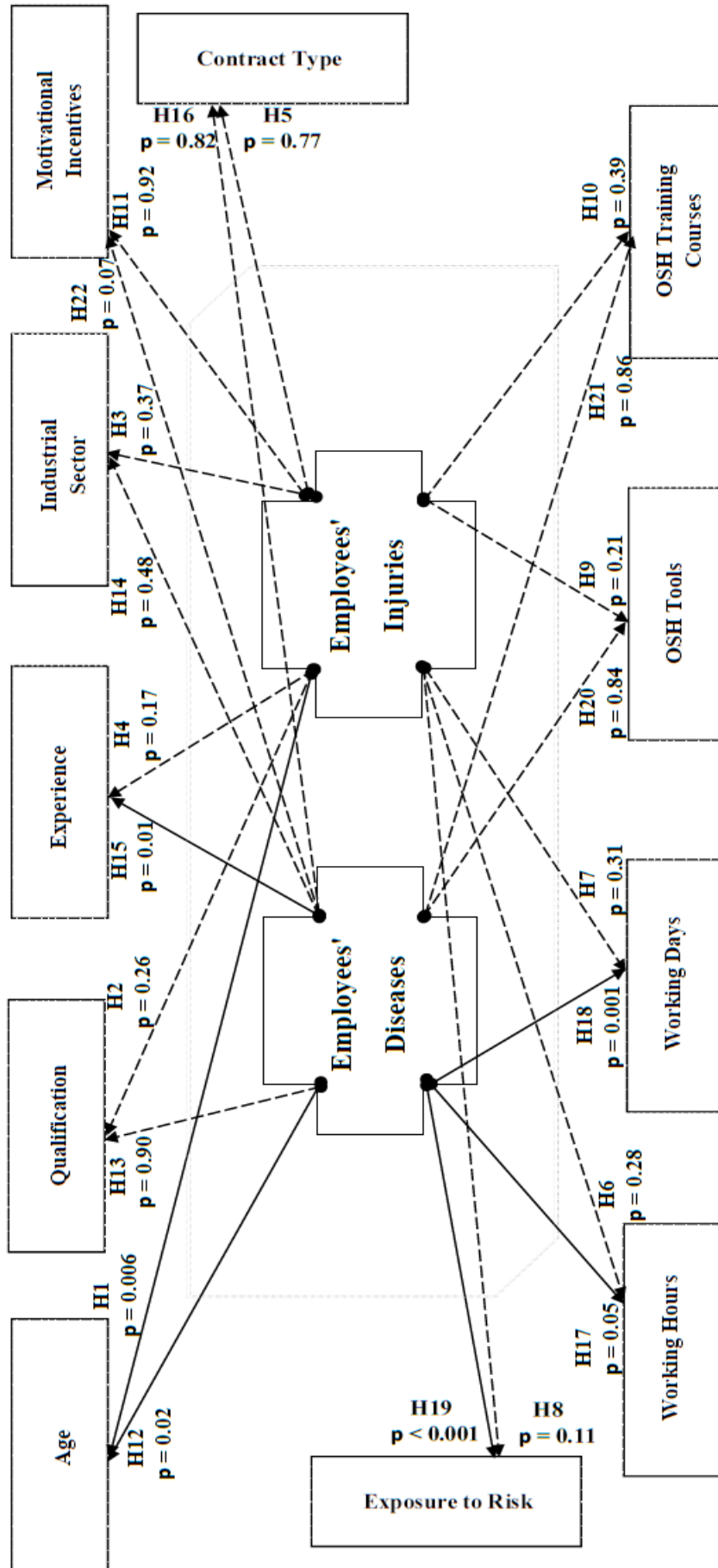


Figure (4.40): The presentation of Case correlation (3) and its hypotheses testing.

✧ Case Correlation (4)

Case (4), the last correlation test will check the relation between occupational diseases -according to both employers and employees- as (**Dependent Variable**), and the primary and periodic medical examinations as (**Independent Variables**).

i. Occupational Diseases/Workplace

The test hypotheses were:

H1: There is no correlation between the primary medical examination and

H2: There is no correlation between periodic medical examinations and occupational diseases.

ii. Occupational Diseases/Employees

The test hypotheses were:

H3: There is no correlation between the primary medical examination and occupational diseases.

H4: There is no correlation between periodic medical examinations and occupational diseases.

Table (4-17) illustrates the values of the correlation coefficients, and the results of the hypotheses' tests.

Table (4-17): Correlation Coefficients and hypotheses testing decisions for case correlation (4).

Hypothesis	df	Pearson (χ^2)	Sig. (p)	Decision
H1	1	0.39	0.54	Rejected
H2	1	0.32	0.57	Rejected
H3	1	2.34	0.12	Rejected
H4	1	2.49	0.12	Rejected

Figure (4.41) summarizes the correlations of the case (4) and the accepted hypothesis.

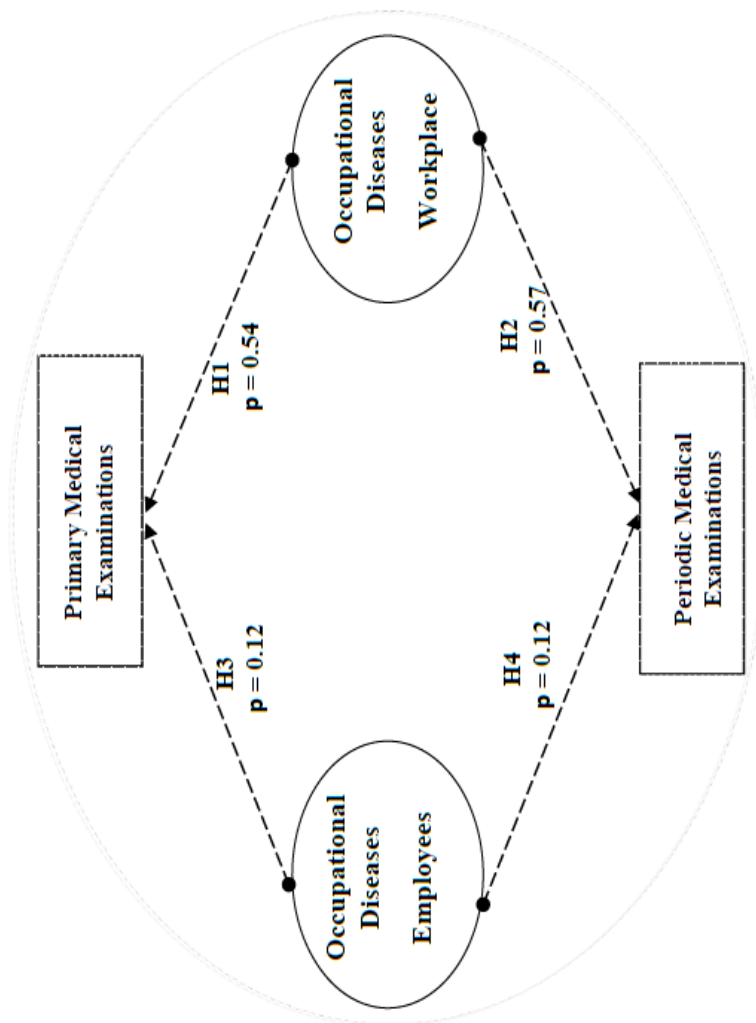


Figure (4.41): The presentation of Case correlation (4) and its hypotheses test

Note that:

● : Hypotheses rejected, positive correlation.

The previous correlation cases shed the light on important OSH variables that could have certain influence on the number of occupational accidents/injuries/ or diseases in the Palestinian manufacturing industries. Case (1) for example, discusses the possible influence of the nature of the industrial sector, providing OSH training courses, and offering motivational incentives on the possibility of exposure to work accidents/injuries/diseases. In fact, this result sounds so logical for a sector that classified as one of the most dangerous sectors worldwide. Such result was clearly proved by Moatari-Kazerouni et al., 2014; Dhanasekar et al., 2014; Kim et al., 2016 who clarified that the new technological improvements, work design changes, and the use of OSH requirements and tools have made the workplace safer. Furthermore, the managerial improvements in the safety culture of organizations by developing OSH strategies and training courses have led to significant advances in reducing occupational accidents and diseases (Hofmann & Burke, 2017). On the same extent, Case (2) clarifies the most affecting variables that threat the OSH in manufacturing industries which are; the possibility of exposure to risk, the availability of OSH requirements, training courses, and strategies, ensuring external cooperation, employees' insurance, inspection, and the number of working hours/days. Actually, Chao et al., 2008 justified the same result by pointing out to the fact that in order to avoid major industry accident that affect workers' lives, manufacturing operations, economic costs, and the whole industrial process, a comprehensive OSH management system is needed. This system should carry out adequate actions for the manufacturing process and their innovated hazards. An OSH system includes providing OSH requirements and tools, as

well as determining suitable working hours for each industry that assures avoiding potential long-time exposure to risk or physical and psychological diseases. Hu et al., 2016 confirmed in their research that long working hours are strongly correlated with burnout when working over 40 hours per week and is even stronger when working over 60 hours per week. That's why limiting working hours to 40 weekly may be beneficial for the prevention of burnout. Also, Pordanjani and Ebrahimi, 2015 confirmed that the best another way to reduce occupational injury and accident rates is investigating the social and organizational factors influencing workplace safety or in other words, promoting the employees' motivation to work safely. Safety motivation influences adherence to safety procedures, and has been found to ensure safety of not only individuals but also organizations and even society. Although, both cases have enforced the importance of the OSH strategies and OSH requirements tools for more safe workplaces. Queries are raised towards the nature, structure, and methodologies of the incentives, strategies, and training courses that activated or developed by the Palestinian industrial establishments, as well as towards their effectiveness and efficiency that led to zero effect in relative to occupational accidents, injuries, and somehow to occupational diseases. These points should be taken into consideration while improving the OSH reality in the industrial establishments, as well as while analyzing the financial losses incurred by lost working days. Finally, the second case in specific, assures that the higher levels of risks, either related to the injuries rates, the severity rate, or any another weighty rate must be taken into consideration so as to prevent or reduce the probability of future occupational accidents.

On the other hand, Case (3) focuses on other personal information that related to industry employees and may have direct impact on the possibility of exposure to occupational injuries/diseases. This case approves the correlation between the number of injuries an industry employee experiences and his; working experience, educational level, number of working hours/days, contract' nature and type, and compliance with OSH tools. Case (3) test shows the age effect on both employees' injuries and diseases. The correlation revealed that employees of ages (21-25) years old were the most prone to occupational injuries, while those of ages (26-30) years old were the most likely to suffer from occupational diseases. This result reflects the consequences of the lack of OSH awareness, the reckless attitude of the employees, and the employee's stability. On the same vein, it puts questions marks on the; employees' preparation and training before using machines or tools, employees' commitment to OSH tools, employees' follow up by establishments, as well as employees' follow up by the governmental and non-governmental entities that deal with workers' affairs. Also, the analysis showed that employees having more than 10 years of experience were the most suffering from occupational diseases. This result can be easily explained by the long period of time passed while exposing to risk sources, in particular, in the occupational diseases' cases that cannot be discovered immediately compared to occupational accidents cases. On the same vein, it was clarified by the correlation test that employees working 8 hours a day, 6 days a week were also prone to occupational diseases. The risky workplace is another variable that shed its effects on employees' diseases. This correlation was confirmed also by Gonzalez-Delgado et al., 2015; Carrillo-

Castrillo et al., 2016 who assured that the Worker characteristics (sex, age, nationality, contract, qualification, and experience or skills) and those related to workplace conditions, the environment, the organization of the work and economic activities can be risk factors due to the differential distribution of exposure or because a particular characteristic affects the worker's behavior. For Case (4) the surveys' analysis assures the correlation between occupational diseases and the primary and periodic medical examinations. Consequently, the absence of these medical examinations that considered of the most important and basic OSH requirement in the workplace could be a main reason for the occupational diseases, as well as one of the LL violations. The absence of definite criteria that determines the concept of the occupational diseases, dealing with them, their causes, and those who are prone to this kind of occupational danger that may threaten their lives, are other serious troubles. Focusing on occupational accidents by OSH officials marginalized the occupational diseases' cases till they became ignored. It became obvious even in the MOL and PICs annual reports that there is no mention for any statistics, procedures, or preventive actions related to occupational accidents cases. However, this neglect has inadvertently contributed to encouraging some employers and employees to violate the law. The number of employees that had recourse to courts seeking compensations for diseases they believed that befell them due to the work nature is factual evidence regarding occupational diseases' problem. The analysis results showed that about 3.2% of the employees had recourse to courts seeking for their legal rights in relative to OSH. Even though, the PICs

assured that the number of outstanding cases in courts between employers and employees stems from this kind of disputes are extremely much more.

While employees claim to suffer from diseases resulted from work, the employers keep denying, claiming that these diseases resulted from something else, somewhere else, or were already existed before the employees' starting work in their establishments. The PICs confirmed that this type of cases stuck unresolved in courts for years as employees cannot submit any tangible proof even an official medical report. Of course, this kind of LL violation pushes some employees to exploit the law by claiming getting infected with occupational diseases just to get compensations from their employers. That's why Yanagisawa, 2016 insisted on the importance of health examinations through enforcement of Health Examinations' Acts that emphasize on workers' right of annual periodic health examination for early detection of workplace diseases.

4.5.4 The Palestinian OSH Reality and Safety Ingredients

The OSH is one of the most trending and problematic subjects all over the world recently. Its grave consequences to humanity, assets, society, and environment, classified it as one of the most complex dilemmas in every single occupation (Torun, 2014). Manufacturing Industries that witness huge technological as well as automation development, are one of the most dangerous industries in the practical life that become fatal under poor OSH regulations (Jilcha & Kitaw, 2017). The OSH status in Palestinian manufacturing industries is not far from this worldwide complication. On the

contrary, it could be the most complicated situation due to the various challenges that harden its development or progress, but in the first place, due to the absence of the main safety ingredients.

Safety is a fully integrated system that should be built on strong solid supports, and valid reliable basis. In order to ensure its effectiveness, it is important to ensure the solidity of its internal and external ingredients. Crowl and Louvar, 2002 clarified in their book that: "a successful safety program requires several ingredients", these ingredients are the basics of strong, valid and reliable OSH body which are called safety pillars, and shown in Figure (4.42).

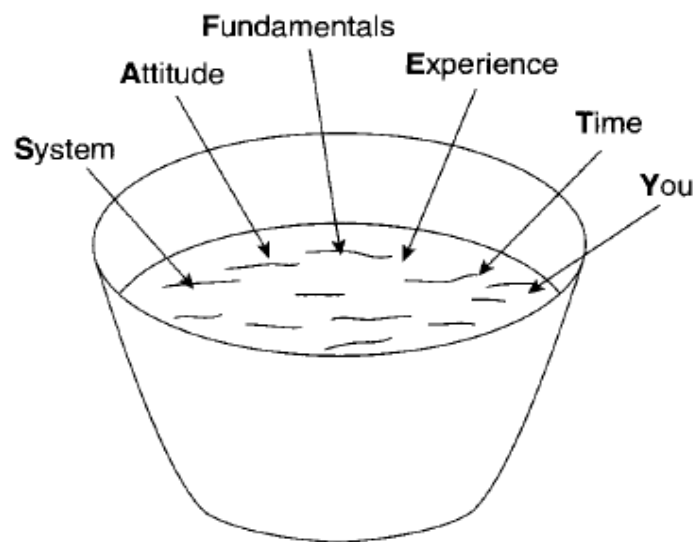


Figure (4.42): The ingredients of a successful safety program according to Crowl and Louvar, 2002.

Developing and enhancing safety in the organizations need six important steps; First: A system. This system includes management, planning, documenting, and follow up. Second: Attitude. The participants in the development process must have and keep a positive attitude that enables them executing their tasks successfully. Third: Fundamentals. All participants should understand the safety fundamentals in every single step in the development process. This understanding is the key factor for the work continuity, as well as for convincing others of the necessity of the process. Fourth: Experience. This ingredient is an acquired and developed one. It is also strongly related to a proper system that documents and records every single task, success, fail that may help in the future (Crowl & Louvar, 2002). Besides, historical data, experts and specialists are very useful resources that could enrich one's experience. Fifth: Time. Developing any program and safety, in particular, needs a lot of time and patience. This time should include; the time for creating information base, training, understanding fundamentals, acquiring experience, sharing information, success and failure times, and documenting each step. Finally, this system needs (You) and every single participant who takes part in the safety development process. It needs their commitment, responsibility, engagement, and involvement in every level of development. It needs unified efforts and sharing. But moreover, Safety programs need balancing these ingredients all together and jointly. Unless that balance exists, this complicated program will definitely collapse, especially, if there is no management's commitment.

The complexity of developing a safety program is the strongest evidence for its significance. Crowl and Louvar, 2002 mentioned that: "Safety must be

given importance equal to production". However, this thesis results promoted the consciousness about two important facts:

◆ First: The need for an OSH program that manages, plans, executes, documents, and follows up the Palestinian industrial sector, including its establishments, employers, and employees, and all other OSH stakeholders.

◆ Second: Safety is much more important than production.

The following sections explain in details the state of the safety ingredients on which the Palestinian industrial sectors stand.

4.5.4.1 System

The success of any system is measured by achieving three main objectives; meeting time and cost, meeting the intended results, and satisfaction (Fortune & Peters, 2005). These previous three points seem missing in relative to the Palestinian OSH system.

Creating a successful system should be based on the desire to achieve certain objectives in which the creators strongly believe. Regarding the Palestinian OSH system, it is obviously noticed that there are neither definite OSH objectives nor belief. What much more obvious is the poor OSH awareness. This poor awareness is not limited to one category; on the contrary, it is a big societal problem. This was evident from observing the status of the industrial establishments, employers, and their employees. Furthermore, discussing the OSH problem with the different concerned entities promote this fact more and more. The OSH entities (MOL & CD) -and in spite of

their efforts towards the OSH issues- look desperate of the current situation as if they are helpless. The state of these entities refers to the absence of OSH awareness among employers, and employees who both form more than 30.0% of the society (ILO, 2018a). On the other hand, the carelessness of both employers and employees of the importance of the OSH is another form of poor awareness.

The absence of OSH awareness was undoubtedly reflected on developing OSH strategies, as well as providing the OSH requirements and tools which are considered a key factor in preventing OSH accidents and diseases, such as, the primary and periodic medical examinations. The concept of strategies is limited to the mega establishments which are very few in Palestine, even though, these strategies are developed for economic purposes only not for OSH ones. Developing strategies needs qualified persons, managers, and OSH supervisors whose availability's percentage in the Palestinian industrial establishments does not exceed 31.0% according to the workplace survey results.

Although about 83.0% of the establishments confirmed developing OSH strategies, the statistics table of these establishments showed another increasing trending line in the numbers of occupational accidents and injuries. Figure (4.43) illustrates the increasing numbers of occupational accidents and injuries in industrial establishments that claimed to develop OSH strategies.

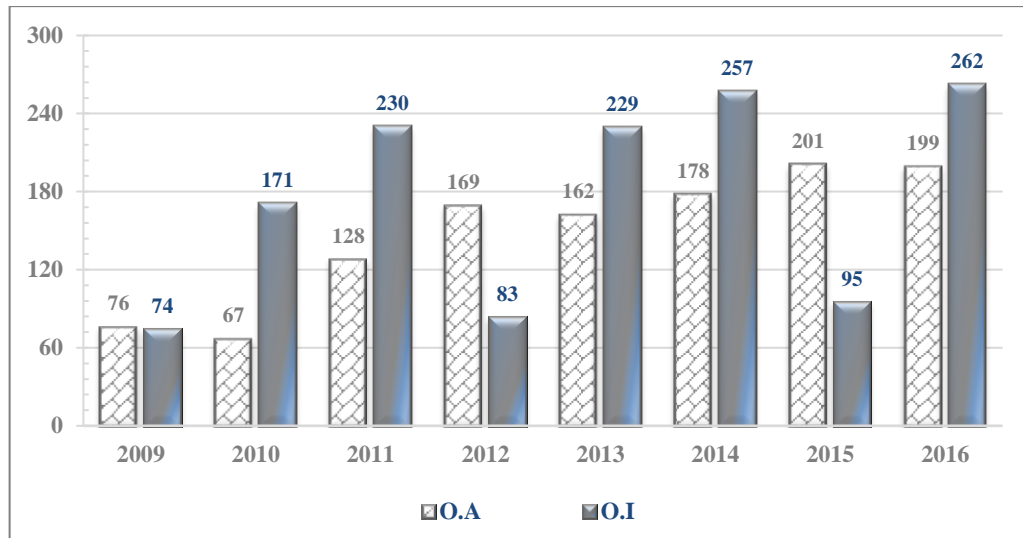


Figure (4.43): The number of occupational accidents and injuries in the industrial establishments that claimed to develop OSH strategies between the years (2009-2016).

Of course, this does not mean that developing the OSH strategies does not reduce or prevent occupational accidents, since, even those establishments who did not confirm developing OSH strategies suffered also from the increasing occupational accidents and injuries. This trend means that either there are certain problems in the process of developing the OSH strategies made the developed ones ineffective, or they do lack experienced, qualified persons for the high-level work.

These numbers also do not exclude the few establishments that do their best to develop OSH strategies, OSH department and provide the best and safest OSH tools and requirements to their employees. One of the most active industrial establishments in developing OSH actions, courses, and procedures complained from the employees' attitude toward the OSH tools provided for them saying that: *(We do our best to buy the best quality of OSH shoes and clothes, but our employees take them home and come the next day*

to do their work without using OSH tools). Moreover, the same establishment complained that they could not penalize any employee for not using OSH tools as there is not any regulation allows them to impose any kind of penalty.

The bad working conditions that employers provide to employees, as well as the dirty and messy environment that characterizes most workplaces, are main causes of occupational accidents. The high percentage that confirmed providing OSH requirements is another misleading percentage. Table (6-2) illustrated in details the contradictory responses of employees and employers. Observing the industrial establishments is another evidence for the absence of the OSH tools that employees should use. Furthermore, the results of the analysis showed that 7.7% of the employees confirmed that their employers *did Not* provide them OSH tools because of; their high price, the absence of external monitoring, not being demanded by employees. The continuous occurrences of occupational accidents are another proof for the unavailability of the OSH requirements and tools, from one side, and the employees' non-commitment toward using them (if exist) from the other side.

By observing the industrial establishments during field visits, it was seen that more than 90.0% of these establishments could never be considered as safe workplaces. This is not an overstatement, this is a fact that any visitor can see. Furthermore, more than 95.0% of the industrial employees practice their work in establishments without using OSH tools. While employers said that they could not convince employees using OSH tools, employees gave other

reasons for that. For example, a metal industries' employee said: (*Wearing OSH tools disturbing me while working, I just feel that I cannot freely move*). The strange was that this employee suffers from (Eczema) which looked strongly affected his hands. Nonetheless, telling him that practicing his work without OSH gloves increases the severity of the diseases that might be a result of his occupation, his answer was (*So what? I used to*). Another metals' employee who insisted to fill out the questionnaire despite his manager's refusal, said: (*They do not provide us any OSH tools, there is nothing*). Some employees were more careless believing that nothing could happen to them, while others looked apathetically depending on religious beliefs or the inevitable fate. In their words, (*Accidents will happen anyway if that is the destiny*).

The zero caring from employers towards their employees, their awareness, and their developments is the other bad side of the problem. What matters for employers is delivering their work done, no more. They are so careless that they did not realize yet that this neglect harms their establishments first, their industry, as well as their society. This OSH reality is so obvious even for OSH officials. One of the MOL employees assured that during one of his inspection's visits to a chemical establishment, he saw an employee working with a ((Caustic)) chemical without wearing any OSH tools. The MOL inspector asked him to wear his gloves or he would burn his hands, the employee did nothing but washing his hands with the caustic material and said: (*Look, it is normal, I can do this*). Through this shock, the MOL inspector could do nothing except warning the establishment as a legal procedure.

These behaviors happen daily in all workplaces, without any strict procedures, or firm sanctions. Furthermore, and due to the absence of documented cases, these violations could not be known if they do not end with death. Exactly as no one can hear anything about these unbelievable behaviors unless; he is one of the OSH entities, researcher, or an (employee).

4.5.4.2 Attitude

The role of individuals in occupational accidents could never be deniable. In the first half of the previous century, or in the 1960s, the Pennsylvania Department of Labor revealed that both unsafe acts and unsafe conditions were recognized as two main contributing factors in occupational accidents with a percent of more than 98.0% (Brauer, 2006). The positive and negative attitudes of both employers and employees determine the occupational safety. Moreover, employees with positive safety attitude are less encountered with occupational accidents (Gharibi et al., 2016). All missing basics and principles in the OSH system stem from the bad attitude toward the OSH. The Palestinian society suffers from a zero OSH culture. This ignorance of OSH issues is not restricted to employers or employees of low-level qualification. On the contrary, many of the highly educated employers and employees behave as unaware as any simple employee. Both parties -the cultured and the non-cultured- do not recognize the workplace risk or hazards, as well as they do not believe that they are exposed to risk.

This problem was one of the hardest through distributing questionnaires. Employers' answer to the number of exposed to risk employees was always zero. But, discussing the concept of exposure to risk with them resulted in

another answer which was: (*Everyone could suffer from accidents, even away from work*). This answer's purpose was to prove that risk is not related to work, it is related to life or destiny. This attitude generated big fear among workers, fear of employers, fear of officials, fear of admitting subjected to accidents or disease, fear of demanding rights, fear of rejecting participating any type of work that he could not do, fear of asking for higher salary, fear of expulsion, and much more, fear of filling out questionnaires. The last one was absolutely the main characteristic that dominated most of the employees. A high percentage of employees gave positive answers after almost every question due to their fear of their employers. On the same vein, other employees kept looking to their employers after each question as if they were waiting for permission to answer, or waiting for their faces' reactions to send them an answer. This fear; for many employees, is another reason for accepting any working condition, especially in a society that full of unemployment.

The employees' fear stems from their ignorance. About 69.6% of the industrial employees had a secondary certificate or less, more than 10.0% of them illiterates. Furthermore, 5.0% of these employees were 20 years old or less, 1.2% of them were less than 15 years old which means that a large percent of the industrial employees are still unaware children. The most dangerous attitude for some employers nowadays is employing this category of employees intentionally.

During the questionnaires' distribution phase, one of the surveyed establishments of plastic industries announced its need for an employee with one single condition: (*did not pass school*). This kind of conditions gives

the employers guarantees that he does not know anything about law, his rights (including OSH requirements), and will never ask for them. That's why; most employers consider developing employees as a disadvantage. A qualified, experienced employee would seek for all his rights, starting with his respect, prestige, higher salary, promotions, vacations, and ending with other legal rights. Also, this kind of employees might help in raising the awareness of others which could threaten the employers' interests.

Fear is also the attitude that not limited to employees. Exactly the contrary, employers showed a high sense of fear during the questionnaire phase. Some of them did not believe that it is a research questionnaire; they believed that it was a trick by taxation or finance to the extent to refuse cooperation completely. Others thought that it was a kind of inspection by OSH officials. This fear creates other bad attitudes towards important procedures such as; documentation and sharing information.

4.5.4.3 Fundamentals

Regarding the fundamentals of OSH in Palestinian industrial sector, a huge gap was created. During the questionnaires' phase, and in spite of the simple language used to build them, many of the employers and employees did not understand various concepts relative to OSH. As mentioned before, employers' perception of workplace risk is surprisingly very poor. On the other hand, while filling out the establishments' statistics table, employers assured that they do not consider daily minor injuries as occupational accidents which promote the idea that their perception of occupational accidents is also poor. On the same table, it was proved that they could not

distinguish between occupational accidents and diseases. The worst thing is that neither employees nor employers understand what a risk source is or where it could exist in their workplace. Safety Knowledge is associated with psychological correlates of safety climate (e.g. safety motivation or initiative), safety behavior and outcomes like injuries or chronic disease. Besides, basic knowledge about health and injury risks at the workplace can be regarded as one of the prerequisites to avoid specific dangers and to adopt generalized safety behavior (Dragano, et al., 2015). Therefore, this poor perception and knowledge help the workplace problems to continue, and the OSH losses to increase. OSH requirements and OSH tools are other two OSH concepts that confuse both employers and employees. The workplace individuals gave the same answers for both concepts. This ignorance of concepts will definitely result in bad management, and lack of responsibility or commitment toward these requirements and tools.

The misunderstanding of principles and fundamentals will surely be reflected on both OSH system and attitude because without proper and intensive awareness and grasp for such fundamentals, it is so factual that anything built on them either strategies, plans, procedures, investigation, documentation, or even training will be shaky.

4.5.4.4 Experience

Although the analysis results showed that about 46.0% of the investigated establishments belong to two of the biggest Palestinian industrial sectors; food and metal industries, and despite the fact that, more than 59.0% of the total investigated establishments are more than 30 years old, while more than

54.0% of the industrial establishments have an estimated capital cost of a quarter million and more, the OSH experience is immature. Most of these establishments still daily suffer from occupational accidents even the most interested in OSH issues. The shortage of OSH experts in the country in addition to the absence of OSH supervisors in the establishments are reasons for this little experience. On the ground, most of the OSH supervisors that employed in the different workplaces are industrial engineers who took a safety course in university, not OSH practical experts that have international OSH certificates. Their short experience affects in a way or another, the OSH system and the attitude of the surrounding environment. This is especially true if the engineer's OSH fundamentals are not strong or trusted.

The industrial establishments compete well in accordance with productivity. However, they still losers with regard to OSH. For example, from 40 food establishments, only 5 had international certificates of which 4 were ISO 9001,22000, and OHSAS 18001. From another side, observing the industrial establishments showed that more than 50.0% of them do not have OSH department, supervisor, and OSH documenting system. Furthermore, only two of the surveyed establishments had investigation forms for occupational accidents that developed by their insurance companies. These percentages mean that the establishments neither investigate accidents nor learn from them to prevent their future reoccurrence. The cooperation between establishments for OSH purposing is almost zero, even though only 47.7% of the establishments activate cooperation with MOL. These details summarize the state of OSH experience in the industrial sector and illustrate the reasons behind the absence of OSH database system.

4.5.4.5 Time

Time which is the most important ingredient in the structure of the safety program could be the weakest ingredient in the OSH system of the Palestinian industrial sectors for many reasons:

- ✓ First: Patience is not a circulated attitude in the Palestinian society. People look for quick results and achievements always which make them unable to wait a long period of time that may exceed years to gain the OSH system's benefits.
- ✓ Second: The political situation forces establishments to put short time plans.
- ✓ Third: Time's importance: Despite the fact that all establishments' owners considerably value their working time, they have a serious problem with priorities from one hand, and do not believe in allocating their time for anything which is out of priorities. For instance, during the questionnaire phase, many establishments refused filling out the questionnaire with the (full-time) excuse even though they were in the brake time.
- ✓ Fourth: Immediate profit: The industrial establishments have already known that developing an efficient OSH system will cost them a lot of money for; requirements, tools, equipment, maintenance, training, experts, documentation system, and research. They may know that the success of this system will save them a lot in the future; nevertheless, they will not risk paying a lot for future profit.

In other words, unless there is a real OSH system controlled by firm law, determinate attitude, strong fundamentals, and experienced staff, time will never be available for such issues.

4.5.4.6 (YOU) Participants

This ingredient beside *Time* are the most affecting ingredients in a safety system. Most think that the safety system is responsible from one single entity which is absolutely wrong. The proper safety system is like a custom, and a living methodology; developed by society, controlled by the law and performed by all living individuals. Gharibi et al., 2016 mentioned in their paper: "According to social and psychological professionals, the knowledge about a topic and concept is effective in creating a positive attitude, and the attitude is considered as the best factor for predicting the individual behavior. The safety culture of a workplace or organization is the product of individual and group values, attitude, perceptions and behavioral models which determine the commitment to health and safety in workplace management". The OSH system in the Palestinian industrial sectors lacks the unified efforts, as well as the cooperation of all OSH stakeholders. Furthermore, it witnesses a lot of disagreements, contradictions, and unfulfilled roles.

Figure (4.44) illustrates the layers that a safety system should consist of, and the stakeholders that must be responsible for supporting each layer.

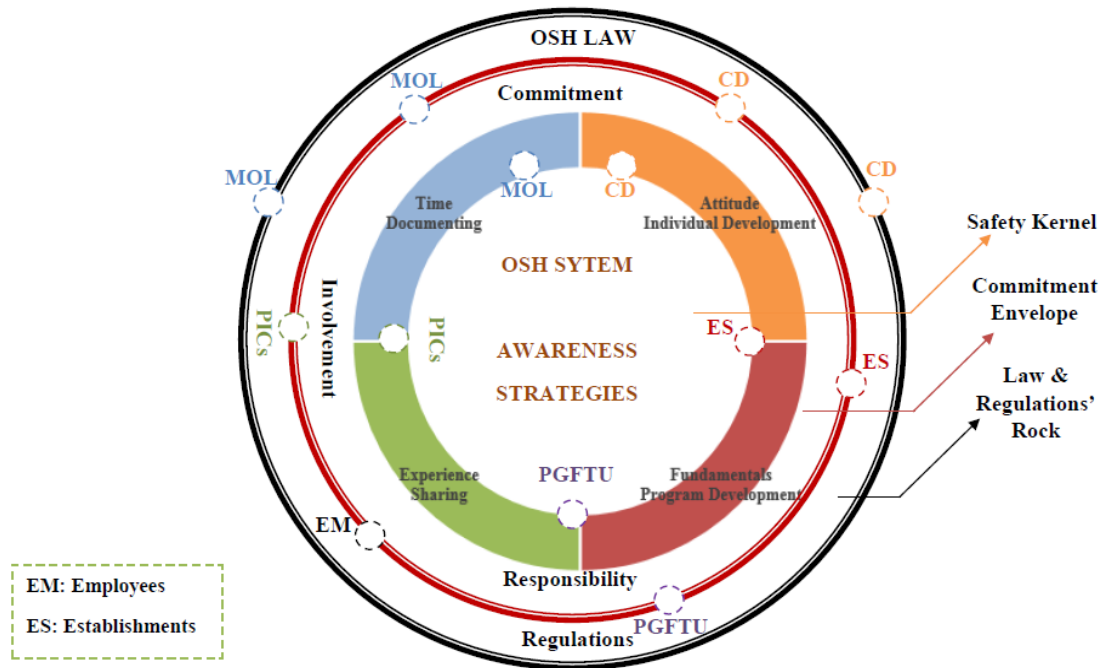


Figure (4.44): The layers and responsibilities in the safety system.

The previous figure represents the main layers of which a safety system's structure consists. The safety layers declare that the kernel of an effective safety system is a perfectly designed and planned system in which; raising the safety awareness is the priority, building safety strategies is a must, as well as the existence of safety requirements and tools is a tangible fact supported by every possible affecting safety stakeholder. Nevertheless, this kernel cannot be formed or shaped unless there is a serious involvement, commitment, responsibility, and cooperation envelope created between every single involved safety stakeholder; from each senior official to the most junior employee. Finally, a commitment envelope will never be efficient without being guided by the law and regulations' rock that built and developed under the supervision of the main safety officials (MOL, CD). Focusing on the small system that mentioned in the safety ingredients aims

to describe the state of the OSH in the industrial establishments, the relations between employers and employees, their attitudes, the working conditions, the ignorance level, and the rejection to adopt a documenting system for the sake of confidentiality. This section will focus more on all OSH stakeholder, their relations, disagreements, dependency, and un-commitment.

➤ **LAW:**

According to MOL and PGFTU, 2000, the estimated numbers of occupational injuries in (1998-1999) - 2 years before issuing the PLL - were 707 and 828 occupational injuries respectively. In addition to, 15 and 31 occupational fatality cases in the same years. Whereas the reported numbers of occupational accidents 18 years after the PLL issuance were 664 occupational injuries including 21 occupational fatalities in 2015, and 682 occupational injuries including 15 occupational fatalities in 2016 according to the MOL annual reports. This comparison may look illogical for some people, but considering the huge differences between both periods of time, the technological revolution, the global openness, and the education percentages, the comparison will surely look very logical. The existence of law is not the destination, it is the beginning. It is right that about 79.0% of the industrial establishments have a copy of the PLL, but the question should be if any of them had ever read it. Another example, about 8.0% of the industrial establishments besides having a copy of the PLL have one or more national and international certificates that related to OSH. 42.9% of these establishments had moderate to very high occupational injury rate.

The Palestinian MOL works hard with the European ILO in developing both the PLL and the OSH state in Palestine. Despite all the strenuous efforts and hard work exerted by MOL in improving the Palestinian OSH reality, there are real tangible deficiencies existed on the ground in relative with the OSH law enforcement policies and methodologies. In addition to occupational accidents and law violations, one of the most critical dilemmas that the officials fail in dealing with it, and has been mentioned by Atturk and Abu-Arra, 2014, is the absence of an obvious mechanism for neither studying nor documenting cases related to occupational diseases. This failure could be a real major threat to the employees' lives on the one hand, and an increase in the likelihood of losing their rights and compensations. Also, this problem will keep unsettling the OSH system as long as there are no specific criteria for identifying and classifying occupational diseases, and as long as there are no compulsory primary and periodic medical examinations that documented in official medical records, as well as linked to the MOL and MOH databases.

Besides that, this law has many gaps and open-ended regulations that enabled many of the employers to utilize without accountability (Beeqawi, 2016). According to Ashurafa, 2016, the main gaps in the PLL in relative to OSH issues are:

- ⊗ The limited scope of law enforcement.
- ⊗ Wages and minimum wages.
- ⊗ Child labor.
- ⊗ Discrimination in wages and promotions.
- ⊗ Violence in the workplace.

- ⊗ The absence of Social Safety Network.
- ⊗ The weakness of the General Administration of Inspection and the limited financial resources.
- ⊗ Very slow court systems, and the absence of specialized courts.
- ⊗ The inaccuracies of the provisions of the Collective Labor Law and the effects of union work.

And much more.

These gaps directly affect the OSH status in Palestine in general, and the industrial sectors, in particular. The MOL, 2016 annual report confirmed that during the last previous years, the cumulative percentage of the inspected establishments was 36.0% which means that practically, and till two years ago, 64.0% of the establishments are Not subjected to PLL. With regard to OSH, the main two official bodies that control the OSH in the Palestinian industrial establishments are the MOL and CD. While MOL is concerned with the employees' safety and health, the CD is linked with the workplace safety. Although their work complemented each other, instead of cooperation, blaming of irresponsibility is existent. CD's side assured that in most occupational accidents cases they reach before the MOL side, even though, that such accident cases were not of their scope. Furthermore, they mentioned many cases where the MOL side looked very negligent. This kind of (officials' conflict) aggravates the OSH problem.

The (officials' conflict) is not restricted to an internal issue, the disagreements with officials extended to include other OSH stakeholders. For example, the relation between CD and some employers are extremely nervous. One of the establishments' owners said: *(They do not know their*

work, they even do not know what they want, they keep changing their minds in relative with the OSH requirements that I should provide in my establishment. A year ago, they asked me to replace the old fire system with powder fire system which cost me about 25,000\$. This year they wanted me to re-replace the powder system with a water fire system! How could this happen when my whole production is either paper or cartoon?? What will happen to my production if a false alarm announced??). The owner of the paper industry establishment was not the only complaining employer. Other employers revealed the CD list of requirements and surprisingly commented: (Look to this list of requirements, despite my establishment's size, and its work nature, they are asking for un-required requirements, they just do a copy- paste list for all, they work with no standards).

On the other hand, an employee in one of the biggest metal establishments commented on the role of the MOL and CD toward OSH issues, saying: *(They do it late)*. The safety engineer continued: *(The role of the OSH officials should start with the establishment's architectural design, but should not end there. We are in a country that most design drawings distorted while execution, their role should keep in all the; planning, executing, delivering, and follow up phases. Many under construction building lack warning signs or protective barriers. Furthermore, they ask for requirements that need previous preparations which double their cost on the establishments. They should learn to be earlier and rational).*

CD is not the only official entity that people complain about, there is discontent from employers toward the MOL too. As mentioned before, some employers complained about the lack of sanction law that enables them to

punish the uncommitted employees as they have no control over them. Other employers said that the new PLL regulations are so unfair for them because they keep emphasizing on the employees' rights till they will own their establishments. At the same time, employees complained from bad working environments, as well as from missing their legal rights, especially their salaries which after 6 years of approving the minimum wages, are still below the minimum.

Away from employers and employees, PICs was another complaining side of the MOL. PICs claimed that they annually incurred large financial losses due to occupational accidents without any serious interventions of the MOL. Regarding the financial losses, and according to the 2016 income statement report for the Palestinian insurance sector, the total compensation paid to workers exceeded 8,800,000\$ raised for more than 11,100,000\$ in 2017 and reached about 7,000,000\$ between (1/2018-6/2018).

PICs agreed with the safety engineer in relative with timing. *(MOL could not complain about the huge number of establishments. They keep inspecting the same establishments while many others suffer from bad conditions. MOL could cooperate with the Chamber of Commerce and Industry to monitor each new licensed establishment. Furthermore, MOL keeps complaining about their few numbers of qualified inspectors and the lack of financial support, when they are a governmental entity and could ask the government to allocate a team of the huge number of security forces to help them inspect these establishments and enforce the law. Isn't that a kind of cooperation to help the country?).* PICs also jaded of all the regulations that hurt their interests.

One of these is; forcing PICs to compensate an employee for an occupational accident which was not reported to them within 48 hours of occurrence by his employer as the fourth condition in the unified document for the insurance of workers issued under the provisions of the Insurance Law No. (20) of the year 2005 confirms. The courts force the PICs to pay these employers and employees despite violating the law document signed between them.

The worst is the manipulation in the numbers and percentages of the insured employees. While MOL 2016 annual report confirmed that the percentage of insured establishments exceeded 58.0%, the percentage of insured employees according to MOL and PICs sources is less than 18.0%. The reason behind such contradiction is that the employers insure their all employees in *one* single insurance policy and use it for all.

The previous percentages and their contradiction raise again the issue that documentation systems should be with many other requirements a *Must* in each official and non-official establishment. The absence of this system covers the reality of the OSH in the industrial sectors, impedes the exchange of information, as well as contributes to the continuity of the occurrences of occupational accidents and diseases.

All the above is few of the law and regulations gaps, problems, deficiencies, and violations. This assures that the law's existence is not enough. Unless the law is effectively enforced, determining all rights and duties, improving the OSH status, enhancing the working conditions, preventing occupational accidents or even reducing them, it is somehow worthless.

The previous facts can clearly and negatively answer the thesis first question, and positively supports the thesis first and second hypotheses which were;

Q1: Is the existence of the OSH law sufficient to mitigate and prevent accidents in the workplace?

H1: There are substantial differences between the existing Palestinian OSH law and the OSHA standards.

H2: There is no significant impact of the Palestinian OSH law on the number of accidents in the workplace.

➤ **Resistance to Change**

Despite the previous troubles with the law and those who are responsible either to enforce or apply it, the officials' attempts to enforce it collide with objections of others. The big challenge faces officials in the society is somehow the (resistance to change) challenge. Imposing new laws, changing the previous ones, developing new systems, modifying structures, and introducing new cultures, all are changes that create fear in the society.

That's why adopting the OSH system in the Palestinian industrial sectors is a very challenging change. The recognition of OSH problems seems very difficult, especially through an uncultured environment like the industrial working environments. That's why; again, the role of stakeholders is a necessity. Raising the OSH awareness of both employers and employees is absolutely the most important step to promote their interests toward OSH. The responsibility of this role lies on MOL, CD, PGFTU, MOH, and all other entities that care about improving the OSH in the Palestinian society.

The role of employers is so weak regarding the OSH awareness, MOL is the most active entity in holding awareness and guidance campaigns. According to MOL, 2016, the MOL campaigns that included 539 establishments of which 26.7% belong to the industrial sector, were divided to 86 awareness workshops, 2 awareness courses, 131 awareness meetings, 18 media meetings, besides distributing 459 awareness materials between brochures, leaflets, posters, laws, etc. Despite that, the awareness tools and techniques seem to be ineffective due to the continuous increasing numbers of occupational accidents and diseases, and law violations. Furthermore, the shortage of qualified, experienced OSH officers affects even the officials themselves. These shortage's effects appear in the methodologies, materials, and the practices developed to raise awareness, or to the individuals' development. At the same time, the OSH experts' shortage affects the strength of the systems developed, leadership, administration, and surely on the involvement of the surroundings.

In relative to the role of PGFTU towards employees, and especially with regard to OSH, the relationship between employees and the body representing employees is never as it should be. It was mentioned in the previous chapter, that about 70.0% of the employees do not belong to any trade union. Furthermore, about 74.0% of the 30.0% who were members in trade unions confirmed that the union did not hold any OSH training courses with the purpose of promoting the awareness of the employees towards their OSH rights in the workplace. On the same vein, 50.0% of the employees believed that trade unions do not have any effective role regarding OSH.

These percentages reflect the fact of the trade unions role toward their employees.

4.5.4.7 Governments

The primer ingredient that has the biggest role in safety issues should be the (Governments). A government that hopes to control and govern a safe society should do its best for the success of such a system. Without a strong governmental commitment and support, initiation, assertiveness, and encouragement, this ingredient could not withstand for a long, and surely, the safety program could not be achieved. The most important role of the government after determining the goals, promoting the skills, and stimulating all interested parties is the development of a strong capacity building's system. This mission can be achieved through:

- Providing officials with financial support to develop qualified OSH trainers, and dispatching them aboard to learn, practice, and acquire the required experience so as to develop effective OSH system, as well as to develop other OSH trainers.
- Providing officials with financial support for employing the required number of inspectors to increase the percentage of establishments controlled by PLL.
- Providing officials with financial support for continuous development, especially in a subject like OSH that updated every year, and every day.
- Providing officials with financial support to review the OSH law and regulations by comparing them with international standards, laws, and

regulations. Especially that, this project was stopped months ago due to a shortage in the budget that hindered the translation funding.

- Providing officials with more power to enforce the law, force establishments to reorganize their systems, and apply sanctions on law violators.
- Providing national support for industries. Either the financial or the moral, both are deeply required from the authorities so as to ensure stability for both employers and employees; a special case here, the leather & shoes industrial sector.

The leather & shoes industries were one of the most prosperous and promising industries in Palestine-Hebron whose production excelled due to its high quality. This quality was the main reason that made the Palestinian production of shoes strongly desired. Even nowadays, most of the shoe production in Israel is made by Palestinian hands. Nevertheless, after the Chinese and Turkish goods' invasion to the Palestinian markets, the national industry became stagnant, most establishments closed, most skilled workforce of the industry left to work in Israel to secure their families' living. The quake that hit this sector was shocking to its individuals who led to creating an unstable environment for both employers and employees, as well as increasing problems in it.

Giving up one of the best industrial sectors in the country is undoubtedly an economic disaster that will result in increasing the Palestinian unemployment on the one hand, and promoting the Israeli labor market on the other. The government role toward a promising national industry like leather and shoe industries must be supporting this industry in every possible

way till it revives again, as well as marketing it nationally and internationally.

- Providing financial support to create a national information base that connects all establishments with the governmental entities so as to assure reliable, and valid documentation system. The absence of documentation systems either at the establishments' level or the national level was one of the biggest problems for this research.
- Supporting Research and Researchers. For the development of any establishment, industry, society, or country, research and researchers are very valuable, effective, and reliable tools. This support includes universities' researchers who could be one of the most precious information sources for countries. Instead of that, the researchers suffer a lot for; obtaining data, trying to meet or interview officials, looking for factual figures and statistics, and most importantly for being disrespectfully received.

This negative attitude toward researchers is so common in the Palestinian communities, in particular, the industrial ones. The questionnaires phase was one of the toughest, most annoying, and most troublesome phases of this thesis due to this bad attitude. Many employers refused the meeting, others rejected filling out the questionnaires. Some employers laughed a lot when heard about the questionnaires and their subjects, while other employers after the long temporization, accepted to take the questionnaires even though, they did not return them back.

One of the employers and after one week of explaining the questionnaires' subject, and what is needed of him shouted saying: (*Your workplace*

questionnaire is so provocative, and overstated. Direct this questionnaire to Mercedes or Apple companies, not for me. I am not in Switzerland, we are a modest company and we do not have these capabilities to provide employees such requirements. Go and let another fill out the questionnaire). This offensive attitude toward researchers has become so normal. An employee refused to check if his employer has finished filling out the questionnaire or not. He just kept saying with a provocative smile: *(Sorry, I can't ask him, sorry I will not ask him).* After a while, and at the moment he was told that the questionnaires were wanted to be retrieved without filling, he stubbornly rejected and said: *(even if these yours, and your name on them, even if you call police, or asked support from any person, I just will not check if they were filled or return them back),* with the same smile.

The government, officials, and all responsible entities must improve the social attitude toward research and researchers, and enable them by giving them some formal that guarantees them being respectfully received and helped.

All the previous problems, gaps, contradictions, disagreements, conflicts, deficiencies, and dominant attitudes that faces the OSH state in the Palestinian industrial sectors, are the direct and indirect causes for occupational accidents and diseases.

Developing the OSH system on the basis of safety ingredients will surely prevent these accidents and create a safe workplace. This intensive discussion gives a logic negative answer to the thesis second question, as well as proves the rejection of the thesis third hypotheses which were;

Q2: Is the Ministry of Labor (MOL) solely responsible for ensuring the seriousness and effectiveness of law enforcement?

H3: There is no significant impact for different stakeholders' roles on the effective enforcement of the Palestinian OSH law.

Chapter Five

Framework Development

Chapter Five

Framework Development

5.1 Chapter Overview

In this chapter, a description of the current Palestinian OSH framework in the industrial sectors based on the available safety ingredients and OSH pillars will be described. Then, this will be followed by discussing the development of an outstanding OSH framework where its pillars have emerged from the literature review, the OSH current status in the Palestinian industrial sector, data collected, and the results' discussions. Developing such a framework could efficiently improve the OSH status in the Palestinian manufacturing industries.

5.2 The Status of the Current OSH Framework

The OSH system is a complete united system where each ingredient, pillar, or individual is considered as an absolute critical input, and where the absence or failure of any of them can definitely destroy the OSH system. Based on the observations, interviews, and the results of the questionnaires' analysis, the current status of an OSH framework was concluded. This framework represents the OSH framework in the Palestinian industrial sectors that existing in the ground.

Figure (5.1) summarizes the Palestinian OSH framework current status and clarifies the gaps and cracks in it.

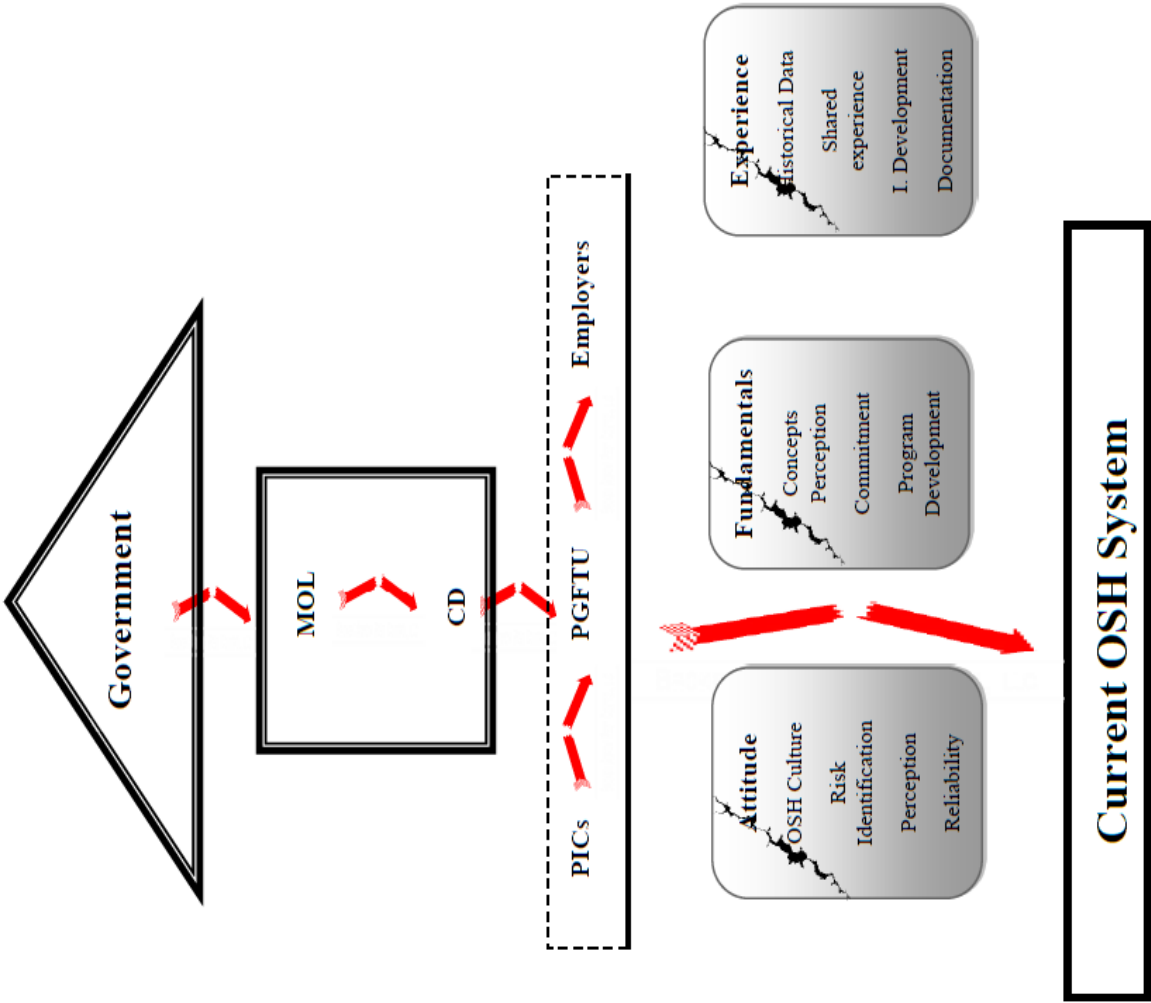


Figure (5.1): The Existing OSH Framework.

The previous figure precisely reflects the current status of the Palestinian OSH system. The figure reflects the lack of commitment, and cooperation between the different OSH stakeholders starting with the top pyramid (the government) and ending with employees. The current framework declares the existence of the important OSH stakeholders like; government, MOL, CD, PICs, PGFTU, and employers, but at the same time shows the broken bonds, relations, and cooperation between them. This is expressed by the broken arrows.

The broken arrow that directs from the government phase toward the OSH officials one reflects the inadequate commitment and support of the government towards the OSH problem. This fact can be seen clearly on the ground through the current status of OSH law that was illustrated in the previous chapter, its gaps, and deficiencies, without making the utmost efforts to develop the OSH law, OSH experts, and the OSH culture in the society despite the numbers of daily occupational accidents. This insufficient commitment is completely reflected on the commitment of the main official entities (MOL & CD) that deal with OSH. They find themselves unsupported, helpless sometimes, and desperate of the employers and their employees' mentality in relative to OSH issues. Moreover, the (officials' conflict) that was explained previously, and how each OSH official or stakeholder blames the other sides in accordance to OSH problems and cast the responsibility on them, is another image for the absence of OSH responsibility, cooperation, and commitment between the OSH stakeholders. On the other hand, the poor OSH culture among both employers and their employees is another reason for such a broken destroyed OSH framework.

The existing OSH framework reflects the poor, shabby, and ignored main safety pillars. No planned systems or developed OSH strategies neither on the governmental level nor on the establishments' level are developed to improve the OSH status in the Palestinian industrial sectors. The negative OSH attitudes among both employers and employees and the unclear OSH fundamentals even among the OSH stakeholders themselves are other huge OSH problems. Furthermore, neither adequate, qualified OSH experts exist, nor OSH historical data were gathered or documented in order to use them in preventing the occurrences of occupational accidents. The worst fact is that there is no scheduled practical effective action plan put so as to improve this disastrous OSH reality.

The ignorance of these safety pillars is a direct reason for the number of occupational accidents in the industrial establishments. The implementation of an OSH framework supported by effective safety pillars will at least ensure the construction of a genuine safety system that is fully supported by OSH stakeholders and their commitment to OSH requirements and tools on the one hand, and thus eliminating approximately 70.0% of occupational accidents occurring annually due to employees' carelessness, non-use of OSH personal protection tools, and the ignorance of danger sources, on the other hand.

Among this OSH reality and this OSH environment of uncommitted government, unsupported officials, irresponsible non-involved stakeholders, and inactive OSH pillars, the current Palestinian OSH framework should definitely be so lawless and broken.

5.3 Outstanding OSH Framework

Building a strong safety system definitely depends on the strength and hardness of its structure and layers, and of course the commitment and cooperation of all responsible OSH stakeholders. Nevertheless, the safety layers cannot stand the strains without having very steady and reliable supporters or pillars. These OSH pillars are the safety ingredients. Figure (5.2) shows the safety system layers supported by the OSH pillars.

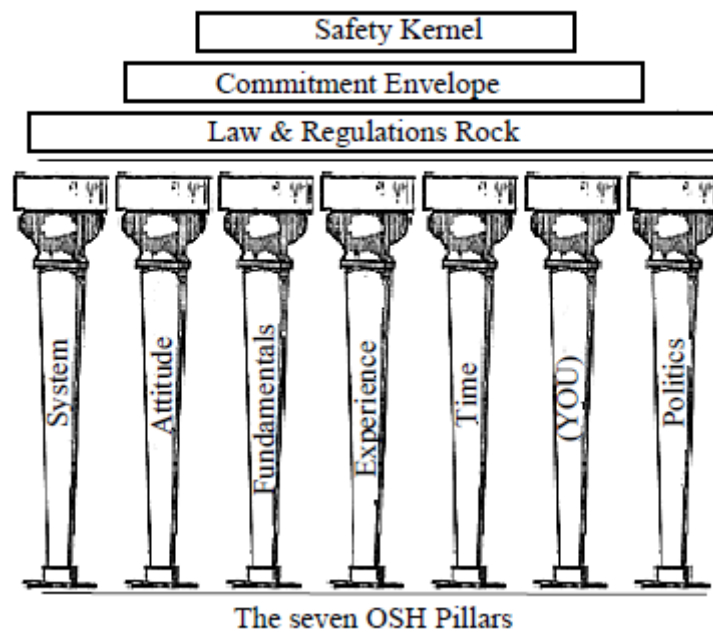


Figure (5.2): The safety layers and OSH pillars.

Depending on the main seven pillars discussed earlier, the literature, observations, and official reports, a conceptual OSH framework has been developed. This framework should help authorities as well as officials in determining the best effective mechanism to activate the OSH law enforcement, and developing efficient OSH system that controls the OSH state in the Palestinian industrial sectors so as to reduce the occupational

accidents. Furthermore, this OSH framework could be a roadmap to a national OSH program that revives and improves the Palestinian OSH reality in any workplace. Within worldwide technological development, as well as the automation expansion, a framework for a good OSH system can promote cooperation between individuals, raise their sense of responsibilities toward safe workplaces, enhance working conditions, identify risk resources, and surely, reduce occupational accidents. However, in a world where its developed societies and countries have already started adopting zero-accident visions, outstanding OSH framework is absolutely needed. An outstanding OSH system is a comprehensive system that can manage risk and prevent its existence. It is not a reducing-accident system; it is a preventing-future accidents occurrence.

An outstanding OSH system is a sustainable system that utilizes from the optimum use of all possible affecting resources, and in all aspects. Safety sustainability can be considered as a process requiring simultaneous global progress in various dimensions where the 7 main OSH pillars are no longer enough. The sustainability privilege adds another 3 substantial pillars to the OSH framework that could definitely improve different sides of the OSH system. Furthermore, it expands the responsibility circle to include the whole society. According to Jilcha & Kitaw, 2017, the additional OSH pillars that would promote the outstanding OSH framework are:

- ◆ Society.
- ◆ Economy.
- ◆ Environment.

Society:

A sustainable system should care about both present and future generations. That's why, the responsibility circle expanded to include more official entities, especially the Ministry of Education and Higher Education (MOHE). The OSH culture in the Palestinian community does not exist. The ignorance of; the OSH concepts, the OSH importance, the risk concept, hazardous workplace, occupational accidents and diseases, and OSH requirements is not limited to uneducated individuals. On the contrary, this ignorance can be obviously seen between almost all highly educated persons such as engineers in the project sites.

The main reason for such attitude towards OSH issues either from educated or uneducated is the absence of this science from school's curriculum. Memorization of the most established sciences, cultures, and information are those gained in a too young age, or in schools' classes (Rusu-Zagar et al., 2013). The inclusion of OSH in primary education will have a very basic, active role as the basic preventive reflexes are acquired in childhood. This fact has called on many officials to incorporate and include the OSH materials into school's curriculum on the one hand, and develop a culture of risk prevention in the educating and training programs at (primary-secondary-university) education, as for any other field in any area. Officials believe that by this way, teachers, children, and young individuals alike learn how to live and work in a safe and healthy working environment. Furthermore, by this strategy, every individual could start his career and

practice his occupation's activities with a strong belief in OSH that will definitely help him in protecting his life and others lives.

Besides schools and university, intensive practical training courses are essentially needed to be held for employers and employees. Focusing only on written awareness tools will not lead to effective results as visual, practical, and animated tools do. So, the development strategy should not be limited to individuals, but on finding innovative awareness methodologies, tools, and techniques. Improving the society culture, developing their preventive senses, and promoting their interests and perceptions of OSH will not only prevent occupational accidents and diseases, or stop the human losses, but surely will lead to human welfare.

Economy:

The huge economic losses incurred by PICs, industries, enterprises, or the national economy due to occupational accidents and diseases either for remedy or compensations, are not the only economic losses. The workplace injuries and illnesses affect the productivity of the industry, as well as reduce the work capacity. Furthermore, this kind of accidents has a considerable impact on the establishments' competitiveness, and their reputation in the industrial sector, in addition to their effects on the individuals and their families' livelihood. Activating the policy of sharing information, and adopting innovative technologies are two effective strategies to prevent occupational accidents and mitigating their economic losses. The accidents' investigation process is another important methodology that can minimize occupational accidents as long as it is perfectly conducted using typical

investigation forms. These forms could effectively help in discovering the accidents' causes, identifying the danger sources, and consequently, inhibiting future accidents. Adopting these methodologies will increase the productivity, enhance the production quality, promote the employees' performances, and for sure will raise the establishments' competitiveness in the industries.

Environment:

Regarding sustainability, both the internal and external environments of the workplace are very important. Besides, the working conditions where employees spent most of their daytime, the workplace's location, design, and arrangements are very significant variables with regard to OSH. The unsuitable location either due to distance, external noise, external smells, or even the industry nature affects the workflow in the establishments. Also, poor interior design hardens the employee's movement and may cause many occupational accidents. The machinery arrangements, the distances between them, emergency exits locations and design, and other designs' errors may easily lead to technical failures, as well as disasters. MOE should be strict toward the industrial establishments and their industrial wastes. The establishments should be so concern to their wastes' disposal methods, as well as sites. The industrial wastes have very serious impacts on the environment, climate, and subsequently on human health. A typical safe workplace with a green environment will protect the lives of employees, employers, and even their families who are far from these establishments. Connecting these three pillars to the rifted existing safety pillars and their

stakeholders on a sequential form phase will eventually result in an outstanding OSH framework. Procedures, responsibilities, as well as the main interventions and policies that related to each pillar, are presented in details in Appendix (5).

Feeding the OSH framework with these 10 significant pillars and effectively activating each pillar by efficient OSH stakeholders' support will absolutely result in an effective outstanding OSH framework. This detailed clarification of the importance and roles of these safety ingredients, components, pillars, and supporters can successfully answer the thesis third question which was;

Q3: What components and ingredients are needed to develop an effective enforcement mechanism for the law to reduce accidents rates in the workplace?

5.3.1 OSH Syndicates

After developing an outstanding OSH framework, it is important to take into consideration all measures and procedures that strongly needed to ensure:

- Successful application and enforcement of all the framework phases.
- Rigorous monitoring and following up to the framework development process away from any possible work obstacles that may result from issues like; corruption, disruption, procrastination, indifference or even any intentional and unintentional errors.

To achieve this, a qualified in charge supervisory body was included into the framework's structure so as to be the primary responsible for overseeing and

advocating the development of the OSH framework and its technical, financial, and temporal requirements. This supervisory body or the (OSH syndicates) is also the main responsible for:

Following up and evaluating the OSH stakeholders' roles.

- i. Dealing with any possible crisis.
- ii. Solving any possible conflict.
- iii. Providing all necessary expertise, modification, advice, and guidance to OSH stakeholders in the interest of the OSH system.

More importantly, the OSH syndicates must have the powers to make decisions in a timely manner without the influence of any higher authority.

Therefore, the OSH syndicates must consist of three nominated divisions of six main entities which are:

- ❖ General Secretariat: Represented as the supreme management and direct supervision by the ILO.
- ❖ Acting General Secretariat: Represented as the field management and certificated authenticator by COSHEP.
- ❖ OSH Syndicates Associates: Represented as the members of OSH syndicates by representatives of all OSH officials (Government, MOL, CD, MOH, MOE, and MOHE), industry employees and their unions, industrial establishments and their industrial federations, as well as insurance companies and their federation.

Figure (5.3) illustrates the structure of the proposed OSH syndicates.

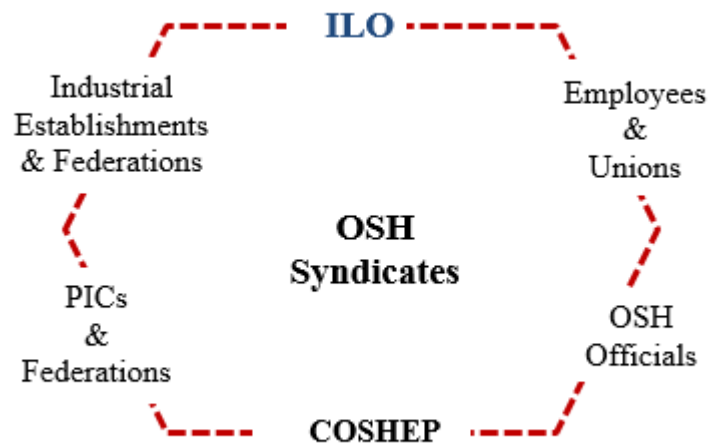


Figure (5.3): The structure of the proposed OSH syndicates.

5.3.2 OSH Framework Time Frame

In terms of time frame, this framework was divided into 4 main phases. The first phase (government phase) related to OSH governmental commitment, and national support. This phase represents the charging and stimulation step for the main interested authorities toward an effective OSH project. At the same time, it keeps supporting the national industries and their products to give their best. The last step to ensure promoting industries, and backing authorities, the needed financial support is provided.

In the second phase, the entities in the (officials' phase) derive the financial, moral, and national support from phase one so as to promote their commitment, responsibility, involvement, coordination, and surely feedback and documentation toward the government first, the project second, the stakeholders and employees third, and the society fourth. This phase witnesses the coordination, planning, individuals' development, and cooperation with the industrial sectors. For the sake of better results, plans,

preparations, and research should be promoted in this phase, as well as the next phases.

The third phase (participation phase) or the (involvement phase) where each stakeholder starts to put his mark and contribution in the project. The start of this phase is the awareness stage, developing the perception toward the OSH issues, training courses, promotions to identify the workplace hazards, and occupational accidents and diseases, strategic planning, building information base, reorganizing the establishments' systems, determining OSH requirements, promoting positive attitudes, strengthening responsibilities and involvement, offering motivational incentives either for stakeholders or employees, cooperation, and feedback.

The last phase is the (program development phase) in which the system will be developed, tested, evaluated, and operated so as to insure sustainable development. Definitely, each stage will be accompanied with revisions, feedback from each input, monitoring for outputs, and documentation for all observations, findings, strength and weakness points, failure, and success.

The success of these phases depends on the continuous work, joint efforts, and interrelated activities where all of them will be conducted and executed within a thoughtful time frame and a well-designed action plan that starts with the government belief and commitment and lasts as long as a real outstanding OSH framework is a priority.

Figure (5.4) presents the OSH outstanding conceptual framework for the Palestinian industrial sectors.

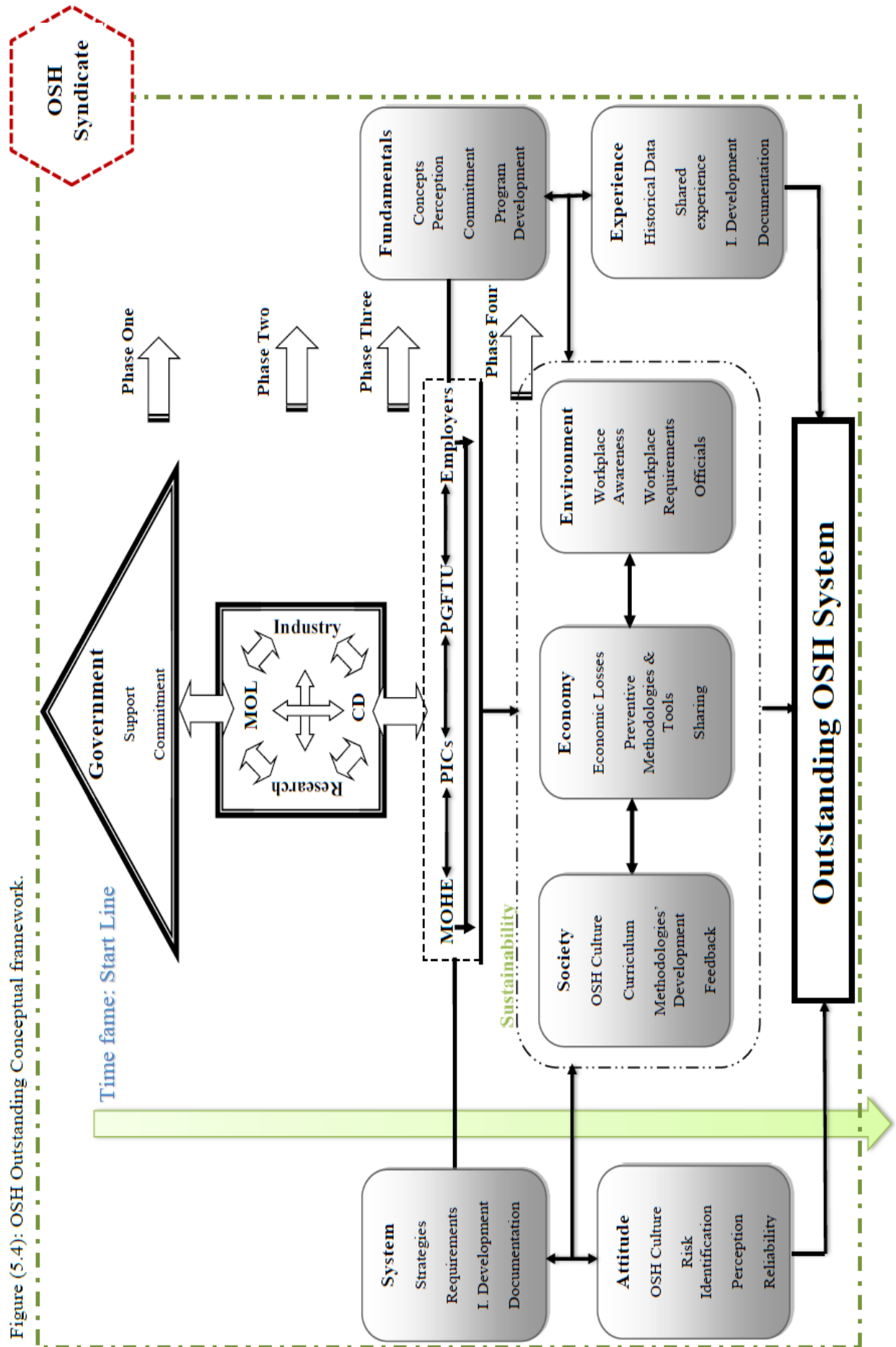


Figure (5.4): OSH Outstanding Conceptual framework.

Chapter Six

Conclusions and Recommendations

Chapter Six

Conclusions and Recommendations

6.1 Chapter Overview

This chapter presents conclusions and recommendations out of this study taking into consideration limitations and obstacles face the preparation of it. Finally, chapter eight proposes important suggestions for future OSH researches.

6.2 Conclusions

After the accomplishment of thesis objectives and aims, several conclusions can be drawn from this study:

- ✧ The Palestinian Manufacturing Sector is a very dangerous sector and a serious threat to individuals' lives and society.

The current OSH framework that was concluded by analyzing the OSH status of the industrial establishments shows how poor the reality of the OSH is in the Palestinian industrial manufacturing sector. Uncovering the numbers of occupational accidents occurring there confirming an average IR of 7,656.0 for the last 8 years. Nonetheless, these reported numbers seem to be also much less than the real numbers. The results' analysis showed that almost all the Palestinian industrial sectors are occupationally very risky, with the risk's level differs from one sector to another. The severity of an industry is not an absolute. It differs according to the severity of the occupational accidents themselves, as well as to their correspondences.

- ✧ The Absence of real OSH System based on Safety Pillars, and an effective OSH Law enforcement criterion.

The absence of good tangible motives and incentives that may encourage employees to reduce occupational accidents. The neglect of the occupational diseases' problem while focusing on occupational accidents has inadvertently contributed to encouraging some employers and employees to violate the law. The traditional OSH awareness tools and methodologies applied by OSH officials are neither efficient nor adequate to reduce or prevent occupational accidents and diseases. The absence of formal accidents' investigations forms in the industrial establishments is a direct reason for the continuous occurrence of occupational accidents from one hand, and the frequent reoccurrence of some occupational accidents from the other hand.

- ✧ The refusal of recognition of the existence of the OSH problem and taking responsibilities are main reasons for the occupational accidents.
- ✧ Cooperation, coordination, sharing, and feedback between the OSH stakeholders are nearly absent.
- ✧ Ignorance, Fear, and carelessness are other direct causes of the continuity of occupational accidents.

Most occupational accidents were due to human faults, either due to employees' carelessness or to the Non-use of the OSH personal and protection tools. Accordingly, if the implementation of a good OSH framework with basic safety pillars could eliminate about 70.0% of the occupational accidents, an outstanding OSH framework will definitely eliminate more than 90.0% of them and prevent future ones. Besides, The

Palestinian society strongly suffers from zero OSH culture, as well as negative OSH attitudes among both the (high and low)-educated and qualified individuals. Extreme ignorance of the risk's concepts, sources, and its short and long-term consequences.

✧ The OSH system is a joint-efforts project that can never be planned, designed, or executed by one single individual or entity. Moreover, the OSH system must be controlled by firm law, determinate positive attitude, strong OSH fundamentals, and experienced staff and given enough time.

6.3 Limitations

During this study, many difficulties, challenges, and limitations were experienced. Follow is summary:

◆ Database:

▪ The absence of a national database that includes all the OSH data from the different OSH officials. Despite the existence of the Palestinian National Center of Occupational Safety, Health, and Environmental Protection (COSHEP) in Hebron, no information was provided. The worst is that neither published OSH data nor documented ones are available in the OSH officials' establishments. The absence of such a unified source of data made access to OSH data as hard as impossible sometimes. Moreover, the absence of a national public database resulted in multi-sources data that affected the data credibility and reliability in few cases.

- The absence of a national database that includes the names of the establishments in each industrial sector, and the number of their employees.
- The absence of clear employees' records in the establishments, as well as the unavailability of occupational injuries/diseases' records. This problem made the process of filling out the workplace questionnaire immediately impossible.

◆ Cultural and Educational Level:

- The low-level education of employees that led to not understand the content of the employees' questionnaire, its terminology, and its internal OSH concepts despite the questionnaire's simplicity.
- The lack of safety research, study, and survey's culture and respect in the Palestinian society. This is a serious problem that hardens the researchers' work while seeking data, and leads to very poor cooperation with them. Also, the poor research's culture absolutely affects the researches' time frame and results.

◆ Reliability:

- The lack of reliability that resulted from:
 - The lack of seriousness toward the research's problem and toward the questionnaires' importance.
 - The ignorance of rights and duties related to OSH.
 - The obvious fear of employers.
 - Being hesitant to answer. (Employees).
 - The ignorance of the research's significance and value.

- Refusing the immediate filling out of the questionnaire, and requesting to fill out and send them later. This resulted in losing the questionnaire's credibility due to the lack of some important data.

◆ Questionnaires' Length:

- The richness and the significance of the OSH issues made the development of long questionnaires inevitable leading to one of the most difficult and challenging limitations, which was the (questionnaires' filling time). The questionnaires' length had a straight effect on the filling process and the results' accuracy. Besides that, many employers refused to fill out the questionnaire because of its size, while others got bored through filling. Such a limitation has also a direct impact on the results' credibility and reliability.

◆ Credibility:

- The weak credibility of the information obtained in advance from the PCBS in relative to; the number of industrial establishments, their economic activity, and their impact on the national GDP. The personal visits to these establishments have revealed the poor classification and methodology that used by the PCBS by finding that:
 - Most of the published lists that related to the industrial establishments' statistics are not up to date.
 - Attainment of many establishments is around 20.00% hence it is off work most of the year.

- Some of the industrial establishments had shortened their working staff to one or two at most, whereas in the list they are intermediate to large company.
- Many industrial establishments were permanently closed.

6.4 Recommendations

Based on the research's findings, the previous conclusions, and the serious limitations, *adopting an outstanding OSH framework based on the safety pillars, supported and monitored by OSH syndicates is a real effective help to OSH officials to improve the OSH reality in the Palestinian manufacturing industries, as well as to reduce occupational accidents and diseases.*

In order to benefit of this developed outstanding OSH framework, it is recommended to:

1. Develop and promote the OSH law
2. Develop the mechanism of law enforcement
3. Develop (Labor Court) that has jurisdiction over labor's cases and issues, and rules on labor or employment-related matters and disputes. This type of courts will have the ability to judge the validity of the LL and review it in a way that assures the protection of the employees and employers' rights.
4. Develop new OSH educational curriculum for all different generations, from basic to higher education in order to raise safety awareness and fundamentals.

5. Adopt national or international OSH strategies, or transferring others' successful experiences in accordance with OSH and applying them to the Palestinian manufacturing industries.
6. Develop a national, public, on-line database and documentation system that includes all the Palestinian statistics, especially that related to occupational accidents and diseases.
7. Learning from previous accidents and experiences

Finally, it is important to emphasize that there is a real need to study, examine, and make use of all previous accidents' data. These data sources will help the whole society from officials to the simplest individual to recognize and admit the existence of the OSH problems. Also, this will enable them to estimate the problem's size, reasons, solutions, and to motivate the government to develop the OSH system so as to compete with other countries. Moreover, published statistics will encourage researchers to held significant researches that will benefit the country and the industries in; solving the OSH problems, creating new ideas, finding answers and solutions, and innovating using huge realistic data from one reliable source.

6.5 Future Research

A rich, fertile topic could produce an infinite number of significant researches, and OSH is one of the topics that generate millions of interesting future researches.

Based on the seriousness and significance of the OSH issues in one of the most important and dangerous industries, more future researches are needed

to raise the officials' attention to the value and the level of the seriousness of the OSH dilemma, as well as to raise the community awareness about the concept of OSH. Moreover, and for better evaluation of the OSH problem in the industrial sectors, it is important to study each industrial sector separately, using different research methodologies that could lead to more precise results. Furthermore, detailed studies could be held to evaluate the actual impact of each OSH variable on the employees' performance, productivity, attitude, and behavior that lead to occupational accidents.

Regarding the OSH law, it is important to conduct a comprehensive comparative study so as to compare the PLL and its regulations and interventions that related to OSH with the OSHA law and the ILO law. Then to draft a new updated Palestinian law that contributes to the protection of individuals' lives, the rights, and guarantees respect for employees, industry, and the society.

The results of this study raise questions about the status of OSH in other manufacturing sectors, and other non-manufacturing ones. Therefore, It is important to make use of this outstanding framework by testing it in other fields of work that have available OSH database.

References

- Aaltonen, M. V. (1996). *Occupational injuries in the Finnish furniture industry*. **Scandinavian Journal of Work, Environment & Health**, 22(3):197-203.
- Abu Amer, K. (2017). *Economic indices paint gloomy future for Palestine*. [online] Al-Monitor. Available at: <http://fares.al-monitor.com/pulse/originals/2017/05/palestine-economy-indexes-high-prices-inflation-minimum-wage.html> [Accessed 14 Aug. 2017].
- Abu Zeiter, S. (2018) *Safety and occupational health and its role in human development and reducing unemployment*. Available at: <http://www.m.ahewar.org/s.asp?aid=596687&r=0> (Accessed: 4th November 2018).
- Al Fadhooley, I. (2017). *وفاة عمالية كل يومين وإصابات كل 39 دقيقة في المملكة* [Online] Hala Jo. Available at: <http://www.hala.jo/2017/11/21/-وفاة-39-دقيقة-وإصابات-كل-يومين-وإصابات-كل-39-دقيقة-وفاة/> [Accessed 9 Dec. 2017].
- Al Habeel, W., & Aiesh, A. (2012). *Evaluating Effectiveness of Occupational Safety and Health Measures in the Scientific Laboratories in the Palestinian Universities in Gaza Strip: a Field Study*. **Journal of the Islamic University for Economic and Administrative Studies (JIUEAS)**, 20(2), 83-143.

- Al Moghny, O. (2006). **The reality of occupational safety and health measures used in the manufacturing sector in the Gaza Strip.** Gaza Strip: The Islamic University.
- Alhajeri, M. (2014). **Health and safety in the construction industry: challenges and solutions in the UAE.** The Institutional Repository for Coventry University (CURVE), 1-204.
- Al-Khatib, A., Maqdadi, R., Habash, R., Aliyan, G., Khofash, F., & Grayesh, S. (2005). *Work injuries in building construction, metal shaping, and food production sectors in Jericho District in the Palestinian territory.* **Eastern Mediterranean health journal**, 11(5-6), 1018-1028.
- Alli, B. O. (2008). **Fundamental principles of occupational health and safety.** (Second Edition ed.). Geneva: International Labour Office- ILO.
- Anderson, N., Bonauto, D., & Adams, D. (2013). *Prioritizing Industries for Occupational Injury and Illness Prevention and Research, Washington State Workers' Compensation Claims Data, 2002-2010.* Washington.: Washigton State Department of Labor & Industries.
- Arasto, H., Hakimovich, A. P., & Esfandiarpour, S. (2015). *Assessment of barriers to establish OSH: a country report.* **Ind Health:National Institute of Occupational Safety and Health**, 53(4): 378–384.
- Ashurafa, R. (2016). *Training Workshop on Social Security System and the Social Protection Floor in Palestine, and the Effective Role of*

- Employers' Organizations - Labor Law Review***. Jerusalem: International Labor Organization (ILO).
- Atturk, L., & Abu-Arra, M. Z. (2014). ***Work Injuries and Compensation in Palestine***. Ramallah: Center for Democracy and Workers' Rights (DWRC).
 - Awadh, H. (2017). **فيراير. انطلاق المؤتمر الدولي الثاني للسلامة المهنية وتقليص 26 خسائر حوادث العمل**. بوابة روز اليوسف [Online]. Available at: <http://www.rosaelyoussef.com/news/details/256541> [Accessed 9 Dec. 2017].
 - Baig, S. A., & Narahari, N. S. (2011). ***Tuning A Welding SME (Small and Medium Enterprises) For Occupational Health and Safety (OHSAS 18001) Certification***. *International Journal of Advanced Engineering Technology*, 2(4), 75-82.
 - Beeqawi, Alaa (2016) **ثغرات في قانون العمل الفلسطيني وجدت من يستغلها**. Available at: <https://www.ultrasawt.com/-العمل-الفلسطيني-ثغرات-في-قانون-العمل-الفلسطيني-وجدت-من-يستغلها-آلاء-البيقاوي/اقتصاد-ومجتمع/عشوائيات> (Accessed: 9th September 2018).
 - Berryman, P. (2017). ***Sectors with Limited OSHA Jurisdiction Have Higher Workplace Injury Rates***. [Blog] Watts Guerra LLP. Available at: <http://www.wattsguerra.com/blog/sectors-with-limited-oshajurisdiction-have-higher-workplace-injury-rates> [Accessed 13 Aug. 2017].

- Bhattacharjee, A. (2012). **Social Science Research: Principles, Methods, and Practices.** (2nd Edition. ed.). Tampa, South Florida.: Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License. Anol Bhattacharjee.
- Bilir, N. (2016). *Occupational safety and health profile : Turkey.* Ankara: International Labour Organization, ILO. Retrieved from http://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo-ankara/documents/publication/wcms_498829.pdf
- BLS (2018) *Incidence rates of nonfatal occupational injuries and illnesses by industry and case types, 2017*, Available at: https://www.bls.gov/web/osh/summ1_00.htm (Accessed: 22 January 2019).
- Bls.gov. (2017). *Census of Fatal Occupational Injuries (CFOI) - Current and Revised Data.* [Online] Available at: <https://www.bls.gov/iif/oshcfoi1.htm#2015> [Accessed 13 Aug. 2017].
- Brauer, R. (2006). **Safety and Health for Engineers.** (2nd Edition ed.). New Jersey: John Wiley & Sons.
- Braun, V., & Clarke, V. (2006). *Using thematic analysis in psychology. Qualitative Research in Psychology*, 3(2), 1-43.
- Burton, L. (2015). *Occupational Illness Examples - Most Common & Prevention.* [Online] High Speed Training Hub. Available at:

<https://www.hightspeedtraining.co.uk/hub/common-occupational-illnesses/> [Accessed 29 Oct. 2017].

- Carrillo-Castrillo, J., Guadix, J., Rubio-Romero, J., & Onieva, L. (2016). *Estimation of the relative risks of musculoskeletal injuries in the Andalusian manufacturing sector*. **International Journal of Industrial Ergonomics**, 52, 69-77.
- Cbs.nl. (2016). *Most accidents occur in metal and construction*. [Online] Available at: <https://www.cbs.nl/en-gb/news/2016/29/most-accidents-occur-in-metal-and-construction> [Accessed 5 Nov. 2017].
- Cdc.gov. (2017). CDC - *Fatality Assessment and Control Evaluation (FACE) Program*: Main Page - NIOSH Workplace Safety and Health Topic. [Online] Available at: <https://www.cdc.gov/niosh/face/default.html> [Accessed 12 Aug. 2017].
- Ceylan, H. (2012). *Analysis of Occupational Accidents According to The Sectors in Turkey*. **Gazi University Journal of Science (GU J Sci)**, 25(4), 909-918.
- Chacko, N., & Gopinadhan, P. V. (2016). *Integrated Safety Management System In A Construction Organization: A Feasibility Study*. **International Research Journal of Engineering and Technology (IRJET)**, 3(6), 2759-2763.

- Chao, C.-J., Wang, H.-M., Feng, W.-Y., & Tseng, F.-Y. (2008). *A Study for Safety and Health Management Problem of Semiconductor Industry in Taiwan*. **Industrial Health**, 46, 575-581.
- Cioni, M., & Savioli, M. (2015). *Safety at the workplace: Accidents and Illnesses*. **SAGE Publications: Work, employment and society**, 30(5), 1-18
- Close, B. (2010). *Analysis of the safety performance measurement system at Company XYZ*. Menomonie, WI: University of Wisconsin-Stout.
- Çolak, O., & Palaz, S. (2017). *The Relationship Between Economic Development and Fatal Occupational Accidents: Evidence From Turkey*. **Scientific Annals of Economics and Business**, 64(1), 19-31.
- Creswell, J. W. (2012). **Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research**. (4th Edition ed.). Boston: PEARSON.
- Crowl, D. A., & Louvar, J. F. (2002). **Chemical Process Safety: Fundamentals with Applications**. (2nd Edition ed.). New Jersey: Prentice Hall PTR.
- Dhanasekar, K., Manigandan, V., Abdul Zubar, H., & Visagavel, K. (2014). *Characteristic Data Analysis of Occupational Accident in Heavy Engineering Industry*. **IJRET: International Journal of Research in Engineering and Technology**, 3(11), 102-106.

- DOL, U. (2016). *Occupational Safety and Health Administration : All About OSHA*. New York: OSHA.
- Dragano, N., Lunau, T., Eikemo, T., Toch-Marquardt, M., Wel, K., & Bambra, C. (2015). *Who knows the risk? A multilevel study of systematic variations in work related safety knowledge in the European workforce*. *Occupational and environmental medicine*, 72(8), 553-559.
- Eldar, S. (2017). *Israel's construction sector deadly for Arab workers*. [online] Al-Monitor. Available at: <https://www.al-monitor.com/pulse/originals/2017/09/israel-palestine-construction-workers-accidents-human-rights.html> [Accessed 10 Nov. 2017].
- Ellis, S., 2017. *Europe vs. the USA: The Biggest Difference in Worker Safety. ORR Safety*. Available at: <https://info.orr.safety.com/blog/usa-vs-Europe-biggest-difference-in-worker-safety> [Accessed May 18, 2018].
- Ferrante, P. (2011). *Incident vs. Accident: What's the Difference?* [online] Safety.blr.com. Available at: <https://safety.blr.com/workplace-safety-news/safety-administration/workplace-accidents/11zll01-Incident-vs.-Accident-Whats-the-Difference/> [Accessed 29 Oct. 2017].
- Fidanc, İ., & Ozturk, O. (2015). *A General Overview on Occupational Health and Safety and Occupational Disease Subjects*. *Journal of Family Medicine and Health Care*, 1(1), 16-20.

- Fortune, J., & Peters, G. (2005). **Information systems : achieving success by avoiding failure**. (2nd Edition ed.). New York: John Wiley & Sons, Ltd.
- Gharibi, V., Mortazavi, S., Jafari, A., Malakouti, J., & Abadi, M. (2016). *The Relationship between Workers'Attitude towards Safety and Occupational Accidents Experience*. **International Journal of Occupational Hygiene (IJOH)**, 8(3), 145-150.
- Gillespie, A. (2016). *Workplace accidents led to nearly 3,000 amputations in 2015*. [Online] CNNMoney. Available at: <http://money.cnn.com/2016/03/18/news/workplace-injuries/index.html> [Accessed 1 Nov. 2017].
- Gonzalez-Delgado, M., Gómez-Dantés, H., Fernández-Niño, J., Robles, E., Borja, V., & Aguilar, M. (2015). *Factors Associated with Fatal Occupational Accidents among Mexican Workers: A National Analysis*. **PLoS ONE**, 10(3), 1-19.
- GOSI. (2016). *The Annual Report of 1437 AH*. Riyadh: General Organization for Social Insurance (GOIS).
- Habib, R. R. (2007). *Study for discussion during the Regional Tripartite Symposium On occupational safety and health in the Arab region*. Damascus: International Labor Office (ILO).
- Hämäläinen. (2007). *The Effect of Competitiveness on Occupational Safety*. **IEEE**, 1888-1892.

- Hämäläinen, P., Saarela, K. L., & Takala, J. (2009). *Global trend according to estimated number of occupational accidents and fatal work-related diseases at region and country level*. **Journal of Safety Research**, 125-139.
- Hamalainen, P., Takala, J., & Saarela, K. L. (2006). *Global estimates of occupational accidents*. **Safety Science**, 44(2), 1-20.
- Hardison and Cochran, (2017). *Common Injuries for Factory Workers / Factory Worker Injuries in North Carolina*. [Online] Available at: <https://www.lawyernc.com/legal-services/workers-compensation-lawyer/common-workplace-injuries/factory-workers/> [Accessed 5 Nov. 2017].
- Hofmann, D., & Burke, M. (2017). *100 Years of Occupational Safety Research: From Basic Protections and Work Analysis to a Multilevel View of Workplace Safety and Risk*. **Journal of Applied Psychology**, 102(3), 35-388.
- HSA. (2015). *Summary of Workplace Injury, Illness and Fatality Statistics 2013-2014*. Dublin: Health and Safety Authority (HSA). Retrieved from http://www.hsa.ie/eng/Publications_and_Forms/Publications/Corporate/HSA_Statistics_Report_2013-2014.pdf
- HSA. (2018). *Summary of Workplace Injury, Illness and Fatality Statistics 2016-2017*. Dublin: Health and Safety Authority (HSA).

Retrieved from
http://www.hsa.ie/eng/Publications_and_Forms/Publications/Corporate/HSA_Statistics_Report_2013-2014.pdf

- HSE. (2004). *Investigating accidents and incidents : A workbook for employers, unions, safety representatives and safety professionals*. London: Health and Safety Executives (HSE).
- HSE. (2015). *Health and Safety in Manufacturing in Great Britain, 2014/2015*. London: Health and Safety Executives (HSE).
- HSE. (2016). *Health and safety at work : Summary statistics for Great Britain 2016*. London: Health and Safety Executive (HSE).
- HSE. (2017). *Fatal injuries arising from accidents at work in Great Britain 2017* . London: Health and Safety Executive (HSE). Retrieved from <http://www.hse.gov.uk/statistics/>
- HSE News. (2017). *2014-2015 Fatality Statistics revealed by HSE*. [Online] Available at: <http://news.safetymedia.co.uk/201415-uk-workplace-fatality-statistics-revealed/> [Accessed 12 Aug. 2017].
- Hu, N.-C., Chen, J.-D., & Cheng, T.-J. (2016). *The Associations Between Long Working Hours, Physical Inactivity, and Burnout*. *Journal of Occupational and Environmental Medicine.*, 58(5), 514-518.
- Idris, N. (2017). *Website Department of Occupational Safety and Health Malaysia - By Sector*. [Online] Dosh.gov.my. Available at:

<http://www.dosh.gov.my/index.php/en/occupational-accident-statistics/by-sector> [Accessed 13 Aug. 2017].

- ILO. (2003). *ILO standards-related activities in occupational safety and health*. Geneva: ILO Publications.
- ILO. (2013). *Plan Safe, Plan Healthy: Guidelines for Developing National Programmes on Occupational Safety and Health*. Geneva: International Labour Organization.
- ILO. (2014). **XX World Congress on Safety and Health at Work 2014. Safety and Health at Work: A Vision for Sustainable Prevention** (pp. 1-48). Frankfurt: ILO Publications.
- ILO. (2017). *The situation of workers of the occupied Arab territories. International Labour Conference, 106th Session, 2017.* (pp. 1-54). Geneva: International Labour Office (ILO).
- ILO. (2018a). *The Occupied Palestinian Territory: An Employment Diagnostic Study*. Geneva: International Labor Organization (ILO).
- ILO. (2018b). *ILOSTAT-Countries*. [ONLINE] Available at: https://www.ilo.org/ilostat/faces/oracle/webcenter/portalapp/pagehierarchy/Page21.jspx?_adf.ctrl-state=2ku1qmr04_4&_afLoop=675845472583270&_afWindowMode=0&_afWindowId=2ku1qmr04_1#! [Accessed 4 September 2018].

- Jaber, H., Alkhawaja, H., Hreesh, N., Abu Hammad, F., & Albarghoothi, B. (2008). *The feasibility and requirements of establishing a national body concerned with occupational safety and health*. Ramallah: Center for Democracy and Workers' Rights (DWRC).
- Jilcha, K., & Kitaw, D. (2017). *Industrial occupational safety and health innovation for sustainable development*. **Engineering Science and Technology, an International Journal**, 20(1), 1-9.
- Kim, I. J. (2016). *Safety and Health Practices in the Food Industry and Ergonomic Interventions*. **J Ergonomics**, 6(1), 1-2.
- Kim, Y., Park, J., & Park, M. (2016). *Creating a Culture of Prevention in Occupational Safety and Health Practice*. **Safety and Health at Work**, 7(2), 89-96.
- Laurie, A. (1998). *Statistics of occupational injuries: Sixteenth International Conference of Labour Statisticians*. Geneva: International Labour Organization (ILO).
- Lboro.ac.uk. (2017). *Working with business, public and voluntary organizations: Road safety Middle East*. [Online] Available at: <http://www.lboro.ac.uk/enterprise/news/2017/road-safety-middle-east.html> [Accessed 10 Nov. 2017].
- Leigh, J. P., Marcin, J. P., & Miller, T. R. (2004). *An Estimate of the U.S. Government's Undercount of Nonfatal Occupational Injuries*. **Journal of Occupational and Environmental Medicine**, 46(1), 10–18.

- Low, W., Isahak, M., Tong, W., Ratanasiripong, P., & Kaewboonchoo, O. (2017). *Conducting a multinational research on the quality of life and occupational health and safety of small and medium enterprise workers in developing countries in Asia*. SAGE Research Methods Cases. doi:10.4135/9781526424891.
- Mekkodathil, A., El-Menyar, A., & Al-Thani, H. (2016). *Occupational injuries in workers from different ethnicities*. **International Journal of Critical Illness and Injury Science**, 6(1), 25-32.
- Mne.gov.ps (2018). *Ministry of National Economy Portal*. [Online] Mne.gov.ps. Available at: <http://www.mne.gov.ps/DesktopDefault.aspx?tabindex=2&tabid=11&lng=2> [Accessed 26 Aug. 2018].
- Moatari-Kazerouni, A., Chinniah, Y., & Agard, B. (2014). *Integration of occupational health and safety in the facility layout planning, part II: design of the kitchen of a hospital*. **International Journal of Production Research**, 53(11), 1-16.
- Moatari-Kazerouni, A., Chinniah, Y., & Agard, B. (2015). *A proposed occupational health and safety risk estimation tool for manufacturing systems*. **International Journal of Production Research**, 53(15), 4459-4475.
- Mohammed, B. (2014). **Relationship of learning organization to promote occupational health and safety in medical imaging**

departments at governmental hospitals –Gaza strip. Gaza Strip: Al-Azhar University - Gaza.

- MOL. (2016). *Annual Report*. Ramallah: MOL.
- MOL, & PGFTU. (2000). *Basic Principles in Public Safety*. Ramallah: Ministry of Labor & Palestinian General Federation of Trade Unions.
- NOSHC. (2015). *National description of the Occupational Safety and Health*. Ramallah: National Occupational Safety and Health Committee (NOSHC).
- Noweir, M., Alidrisi, M., Al-Darrab, I., & Zytoon, M. (2013). *Occupational safety and health performance of the manufacturing sector in Jeddah Industrial Estate, Saudi Arabia: A 20-years follow-up study*. *Safety Science*, 53, 11-24.
- Onrec.com. (2017). *Workplace Safety Measures to Protect Your Employees* Onrec. [Online] Available at: <http://www.onrec.com/news/opinion/workplace-safety-measures-to-protect-your-employees> [Accessed 29 Oct. 2017].
- Osha.europa.eu. (2018). *Mission and vision - Safety and health at work - EU-OSHA*. [Online] Available at: <https://osha.europa.eu/en/about-eu-osha/what-we-do/mission-and-vision> [Accessed 18 May 2018].

- Osha.gov. (2017). *Safety and Health Add Value*. [Online] Available at: <https://www.osha.gov/Publications/safety-health-addvalue.html> [Accessed 12 Aug. 2017].
- OSHC. (2006). *National Profile on Occupational Safety and Health in (Phillipines)*. Manila: Occupational Safety and Health Center (OSHC).
- OSHD. (2014). *A Safe and Healthy Workplace : A Great Work Life*. Bendemeer: Ministry of Manpower (MOM). Retrieved from <https://www.mom.gov.sg/~media/mom/documents/safety-health/reports-stats/oshd-annual-report-2014/full-annual-report.pdf?la=en>
- Pal-Trade. (2015). *Exporters Directory*. Ramallah: Palestine Trade Centre (Pal Trade).
- PCBS. (2013). *The Establishment Census 2012: Final results*. Ramallah.: Palestinian Centre of Bureau Statistics (PCBS).
- Pordanjani, T., & Ebrahimi, A. (2015). *Safety Motivation and Work Pressure as Predictors of Occupational Accidents in the Petrochemical Industry*. *Health Scope*, 4(4), 1-5.
- PSBC. (2016). *Economic Survey Series, 2015: Basic Results*. Ramallah.: Palestinian Standard Bureau of Statistics (PSBC).
- Rommel, A., Varnaccia, G., Lahmann, N., Kottner, J., & Kroll, L. E. (2016). *Occupational Injuries in Germany: Population-Wide National*

Survey Data Emphasize the Importance of Work-Related Factors.
PLoS ONE, 11(2), 1-16.

- Rusu-Zagar, G., Iorga, I., Anghel, S. O., & Rusu-Zagar, C. (2013). *Occupational Safety and Health in National Education.* **Procedia - Social and Behavioral Sciences**, 92, 832-837.
- Salem, S. (2009). *Occupational Health and Safety in Industrial Establishments in Palestine.* **Al - Quds Open University Scientific Journals**, 16, 1-44.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). **Research Methods for Business Students.** (5th Edition. ed.). Boston: Pearson Education, Inc.
- Shareki, D. (2017). *16.5 %ارتفاع في إصابات العمل*. [Online] Kenanaonline.com. Available at: <http://kenanaonline.com/users/tamersafety/posts/575061> [Accessed 13 Aug. 2017].
- Silvestri, A., De Felice, F., & Petrillo, A. (2012). *Multi-criteria Risk Analysis to Improve Safety in Manufacturing Systems.* **International Journal of Production Research**, 50(17), 4806–4821.
- Staff, T. (2016). *Work-related deaths in Israel among highest in West, report finds.* [Online] Timesofisrael.com. Available at: <https://www.timesofisrael.com/work-related-deaths-in-israel-among-highest-in-west-report-finds/> [Accessed 10 Nov. 2017].

- SWA. (2015). *Work-related traumatic injury fatalities, Australia*. Canberra: Safe Work Australia (SWA). Retrieved from <https://www.safeworkaustralia.gov.au/system/files/documents/1702/work-related-traumatic-injury-fatalities.pdf>
- Takala, J., Hamalainen, P., Nenonen, N., Takahashi, K., Chimed-Ochir, O., & Rantanen, J. (2017). *Comparative Analysis of the Burden of Injury and Illness at Work in Selected Countries and Regions*. *Central European Journal of Occupational and Environmental Medicine*, 23, 1-26.
- Thompson, S. K. (2012). **Sampling**. (3rd Edition. ed.). New York.: John Wiley & Sons, Inc.
- Torun, M. (2014). *Workplace Accidents and Their Social Consequences*. *Centre for Policy Analysis and Research on Turkey (ResearchTurkey)*, 12, 6-13.
- Umeokafor, N., Evaggelinos, K., Lundy, S., Isaac, D., Allan, S., Igwegbe, O., . . . Umeadi, B. (2014). *The Pattern of Occupational Accidents, Injuries, Accident Causal Factors and Intervention in Nigerian Factories*. *Developing Country Studies - (IISTE)*, 4(15), 119-127.
- USAID, & PFI. (2009). *The Current Status of Industrial Sector in Palestine*. Ramallah, Palestine: CARANA:USAID.

- Venkataraman, N. (2008). *Safety Performance Factor*. **International Journal of Occupational Safety and Ergonomics (JOSE)**, 14(3), 327–331.
- Williams, C. (2007). *Research Methods*. **Journal of Business & Economic Research**, 5, 65-72.
- WSH. (2014). *Global Estimates of Occupational Accidents and Work-related Illnesses 2014*. Singapore: Workplace Safety & Health Institute (WSH).
- WSH. (2016). *Workplace Safety and Health Report 2016, National Statistics*. Singapore: Workplace Safety and Health Institute (WSH).
- Yanagisawa, N. (2016). *The Future of Occupational and General Health in Japan*. **Industrial Health**, 54, 191-193.
- Zaghlool, Y. (2008). *The reality of occupational safety and health in Palestine*. **First National Conference on Occupational Safety and Health in Palestine**. (pp. 57-72). Ramallah: Ministry of Labor.
- Zaki, G. R., El-Marakby, F. A., Deign El-Nor, Y. H., Nofal, F. H., & Zakaria, A. M. (2012). *Occupational safety of different industrial sectors in Khartoum State, Sudan. Part 1: safety performance evaluation*. **Journal of the Egyptian Public Health Association**, 87 5-6, 131-136.

- Zekri, M. k. (2013). **Construction Safety and Health Performance in Dubai**, 1-84.

Appendices

Appendix (1): Questionnaires

Appendix (1A)

An-Najah National University
Faculty of Graduates Studies
Engineering Management Program

Workplace Questionnaire

Dear owners of the industrial establishments and representatives

After greeting and appreciation,

Thanks for dedicating part of your time to enrich this research that aims to: read the OSH reality in the Palestinian industrial establishments, specifically in; the food, chemical, metallurgical, wooden, plastic, leather, and paper sectors, as well as to construct a reliable, accurate information source related to these establishments and their OSH status. This research will be used to enhance and enrich a master's thesis entitled:

(Development of a Conceptual Framework for Occupational Safety and Health in Palestinian Manufacturing Industries)

The research is divided into five phases:

Phase one aims to obtain general information about the Palestinian industrial establishments, while the second phase aims to identify the data of their employees. The third phase deals with the OSH requirements and their availability in these establishments. Whereas phase IV deals with occupational accidents and diseases, phase V consists of a detailed table that related to the OSH statistics in the Palestinian industrial establishments.

The research may take some of your time, however, it is important to read all the questions and queries and answer them with credibility and objectivity, knowing that all the information that would be provided in this research will be treated confidentially and will be used only for the purpose of the scientific research.

Supervisor: Prof. Amer El Hamouz

Researcher: Eng. Hanan Tuhul

Tel: 00972599220351

E-mail: eng_h_tuhl@hotmail.com

Phase One: Establishment's Information**Establishment Name:** -----**Year of Origin:** -----**Owner/ Representative's Name:** -----

- 1. Academic Qualification:** ☐ A. Less than secondary ☐ B. Secondary
☐ C. Diploma ☐ D. B.A ☐ E. Postgraduate

Establishment Address: -----☐ A. Headquarters ☐ B. Sub-HQ**Telephone No.:** -----**E-mail:** -----**2. Industrial Sector:**

- ☐ A. Food & Beverages ☐ B. Chemical ☐ C. Metallurgical
☐ D. Paper & Cartoon ☐ E. Leather & Shoes ☐ F. Aluminum
☐ G. Plastic ☐ H. Wooden & Furniture

3. Employees No. (exposed to the risk) in the establishment: -----**4. Establishment Capital (In JD):**

- ☐ A. More than 1M ☐ B. More than 250×10^3 , less than 1M
☐ C. More than 100×10^3 , less than 250×10^3 ☐ D. More than 40×10^3 , less than 100×10^3
☐ F. More than 5×10^3 , less than 40×10^3 ☐ G. Less than 5×10^3

5. Establishment Size:

- A. No. of Buildings: ----- B. Buildings Size: ----- C. Total Area: -----

6. Establishment Status: ☐ A. Insured* ☐ B. Non-Insured*

*(against occupational Accidents)

7. Insurance Company Name: -----**8. Work Timing:** ☐ A. Diurnal ☐ B. Nightly ☐ C. Both

With the help of the establishment's Human Resources Department please answer the following section

Phase Two: Employees Information

A. No. of exposed employees by age & sex

Age Group \ Sex	< 15	15-20	21-25	26-30	31-35	36-40	41-45	> 45
Male								
Female								

B. No. of exposed employees by qualification & sex

Qualification \ Sex	Illiterate	Preparatory & less	Secondary	B.A	M.A	PhD
Male						
Female						

C. No. of exposed employees by years of experience & sex

Experience \ Sex	A year & less	2-4	5-8	9-12	13-16	17-20	21 & more
Male							
Female							

D. No. of exposed employees by contract & sex

Contract \ Sex	Permanent	Temporary
Male		
Female		

E. No. of working hours of exposed employees (in)

Period	Day	Week	Month	Year
No. of Working hours				

Phase Three: OSH Requirements

Please put (X) in the answer box that suits you		
9-	Does the establishment have a recognized international certificate of OSH? If Yes, please specify their name and type	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO Certificate: -----
10-	Does the establishment comply with the OSH laws and procedures stipulated by the PLL?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
11-	Does the establishment contain a copy of the safety legislations to be complied with in accordance with the law?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
12-	Does the establishment have a specialized OSH department?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
13-	Is there a qualified person to supervise the OSH issues of the establishment?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
14-	Do employees undergo a pre-employment medical examination at the establishment?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
15-	Do employees undergo a periodic medical check-up during their association with the establishment?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
16-	Are workers subject to preventive medical services (such as preventive vaccination)?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
17-	Does the facility provide health services to its employees? If Yes, please specify the type of service (Allows more than one option)	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-Healthy drinking water <input type="checkbox"/> D-Wash basins <input type="checkbox"/> E-Sanitary toilets <input type="checkbox"/> H-Healthy dining rooms <input type="checkbox"/> F-Changing rooms
18-	Is the establishment equipped with first aid?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
19-	Is there a resident doctor in the establishment?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
20-	Does the establishment provide breaks for its employees? If Yes, please specify	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO C-Break Time: ----- D-Break Length: -----
21-	Does the establishment provide breaks spaces for its employees?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
22-	Are there clear and visible phone numbers to emergency centers to communicate with in the event of occupational accidents?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
23-	Are there clear and visible OSH signs and posters for in the establishment?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
24-	Are there machines' identification cards close to machines that clarify how to use them?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO

25-	Are there clear and visible OSH guidelines and instructions for machines in the establishment?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
26-	Does the establishment regularly maintain machines? If Yes, what is the period between each maintenance process and the other?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-6 months <input type="checkbox"/> D-12 months <input type="checkbox"/> E-18 months <input type="checkbox"/> F-More than that <input type="checkbox"/> G-Another choice, mention it: -----
27-	Do employees undergo prior training on machines before using them?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
28-	Are there clear and visible emergency exits in the establishment?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
29-	Is there a pre-planned evacuation plan at the establishment in case of accident occurrence?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
30-	Are employees trained in the evacuation plan?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
31-	Is the establishment equipped with alarms of gas detection and leakage?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
32-	Are employees in the establishment trained in the use of firefighting equipment?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
33-	Number of insured employees in the establishment	<input type="checkbox"/> A- No one (Zero). <input type="checkbox"/> B- (1-5) <input type="checkbox"/> C- (6-10) <input type="checkbox"/> D- (11-15) <input type="checkbox"/> E- (16-20) <input type="checkbox"/> F- (21-25) <input type="checkbox"/> G- (26-30) <input type="checkbox"/> H- ≥ 31
34-	Does the establishment provide OSH requirements for employee? If Yes, please indicate the available OSH requirements at the establishment	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO C-The available OSH requirements at the establishment are: ----- ----- ----- -----
35-	Do employees undergo specialized training courses during their association with the facility? If Yes, please provide some examples of these courses	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO C-The courses: ----- ----- -----
36-	Does the establishment follow employees' compliance with OSH requirements?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
37-	Are there certain residues issued by the establishment? If Yes, what kind of waste? How does the establishment get rid of them?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-Gas <input type="checkbox"/> D-Solid <input type="checkbox"/> E-Liquid F-Method of disposal: -----

Phase Four: Occupational Accidents & Diseases

Please put (X) in the answer box that suits you		
38-	Number of occupational accidents in the establishment during the last year	<input type="checkbox"/> A-(1-5) <input type="checkbox"/> B-(6-10) <input type="checkbox"/> C-(11-15) <input type="checkbox"/> D-(16-20) <input type="checkbox"/> E- > 20
39-	Frequency of occupational accidents occurrences during the month	<input type="checkbox"/> A- 0 Time <input type="checkbox"/> B-(1-3) <input type="checkbox"/> C-(4-6) <input type="checkbox"/> D- > 6
40-	Reasons behind the accident's recurrences	<input type="checkbox"/> A-Non-use of personal protection and protection tools <input type="checkbox"/> B-Lack of arrangement and organization in the workplace <input type="checkbox"/> C-No machinery maintenance <input type="checkbox"/> D-The absence of guidance and warning signs around machines. <input type="checkbox"/> E-Ignorance using machinery by some employees <input type="checkbox"/> F-Employees carelessness <input type="checkbox"/> G-Fatigue and exhaustion suffered by the employees in the establishment <input type="checkbox"/> H-Employees' ignorance of the sources of danger in the establishment <input type="checkbox"/> I-Workers perform tasks outside of their specialization and work <input type="checkbox"/> J-Another reason, mention it: ----- --
41-	Number of occupational injuries during the last year	<input type="checkbox"/> A-(1-5) <input type="checkbox"/> B-(6-10) <input type="checkbox"/> C-(11-15) <input type="checkbox"/> D-(16-20) <input type="checkbox"/> E- > 20
42-	Number of occupational patients during the last year	<input type="checkbox"/> A-(1-5) <input type="checkbox"/> B-(6-10) <input type="checkbox"/> C-(11-15) <input type="checkbox"/> D-(16-20) <input type="checkbox"/> E- > 20
43-	Is there a record for occupational accidents in the establishment?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
44-	Is there a record for occupational fatalities in the establishment?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
45-	Is there a record for occupational diseases in the establishment?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
46-	Number of employees' absence due to occupational accidents during the last year	<input type="checkbox"/> A- < 5 days <input type="checkbox"/> B-(5-10) days <input type="checkbox"/> C-(11-15) days <input type="checkbox"/> D-(16-20) days <input type="checkbox"/> E-(21-25) days <input type="checkbox"/> F-(26-30) days <input type="checkbox"/> G- ≥ 31 days
47-	Additional losses incurred by the establishment due to occupational accidents (Allows more than one option)	<input type="checkbox"/> A-Employees' compensations <input type="checkbox"/> B-Cease of production process <input type="checkbox"/> C-Machines and property <input type="checkbox"/> D-Skills and expertise <input type="checkbox"/> E-Training costs on machinery <input type="checkbox"/> F-Training costs on safety tools (if any) <input type="checkbox"/> G-The high cost of the insurance policy due to the increase in occupational accidents <input type="checkbox"/> H-Another choice, mention it: -----

48-	Are occupational accidents reported? If No, go to Question (52) If Yes, please specify the number of accidents reported by the establishment	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-(1-5) <input type="checkbox"/> D-(6-10) <input type="checkbox"/> E-(11-15) <input type="checkbox"/> F-(16-20) <input type="checkbox"/> G- > 20
49-	The notified / informed entity (Allows more than one option)	<input type="checkbox"/> A-MOL <input type="checkbox"/> B-Insurance Co. <input type="checkbox"/> C-Police <input type="checkbox"/> D-MOH <input type="checkbox"/> E- Civil Defense <input type="checkbox"/> F-Another entity, mention it: -----
50-	Has an investigation been launched into the occupational accidents?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
51-	Are there investigation forms for occupational accidents and their causes in the establishment? If Yes, please attach a copy of the form with the questionnaire via e-mail	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
52-	Did the establishment take certain procedures after the accident to prevent recurrence? If Yes, please mention these procedure	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO C-Post-accidents procedures: -----
53-	Are there any procedures taken by the establishment to motivate employees to reduce and prevent accidents? If Yes, please mention some of these procedures	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO C-Motivating procedures: ----- ----- -----
54-	Has the establishment been subjected to inspection by the OSH authorities? If Yes, please provide the name of the inspector	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-Inspector: ----- -----
55-	The number of inspections the establishment underwent during the last year	<input type="checkbox"/> A-Zero <input type="checkbox"/> B-Once <input type="checkbox"/> C-(2-4) <input type="checkbox"/> D-(5-7) <input type="checkbox"/> E- > 7
56-	The last inspection the establishment underwent by OSH officials was before	<input type="checkbox"/> A-Less than month <input type="checkbox"/> B-(1-4) months <input type="checkbox"/> C-(5-8) months <input type="checkbox"/> D-(9-12) months <input type="checkbox"/> E- more than a year
57-	Has the establishment been ever closed for OSH issues?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
58-	Does the establishment care about building strategies for reducing occupational accidents and diseases?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
59-	Is there any cooperation between the establishment and governmental and non-governmental entities to reduce occupational accidents? If Yes, please provide your name	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-The cooperating party: ----- -----

Phase Five: Establishment's Occupational Accidents & Diseases Statistics

Referring to the establishment statistics records and specifically the period between the years (2009 - 2016), please fill out the following table

No. Year	C. Employees	Number of O. Accidents	Number of O. Injuries	Number of O. Fatalities	Number of O. Patients	Type of O. Disease	LWD	F.L (\$)
2009								
2010								
2011								
2012								
2013								
2014								
2015								
2016								

Where: O.: Occupational, LWD: Lost Working Days, F.L: Financial Losses, C.: Constant.

Thank you for your cooperation

Appendix (1B)

An-Najah National University
Faculty of Graduates Studies
Engineering Management Program

Employees Questionnaire

Dear Employees

After greeting and appreciation,

Thanks for dedicating part of your time to enrich this research that aims to: read the OSH reality in the Palestinian industrial establishments, specifically in; the food, chemical, metallurgical, wooden, plastic, leather, and paper sectors, as well as to construct a reliable, accurate information source related to these establishments and their OSH status. This research will be used to enhance and enrich a master's thesis entitled:

(Development of a Conceptual Framework for Occupational Safety and Health in Palestinian Manufacturing Industries)

The research is divided into four main phases

Phase one aims to obtain general information about the employees working in the Palestinian industrial establishments. While the second phase's goal is to identify the reality of OSH that experienced and lived by the employees in the industrial establishments, the third phase focuses on determining the employees' awareness level of the danger's sources and how to deal with them. The fourth phase looks forward to question the employees' view toward the trade union's role towards their personal OSH.

The research may take some of your time, however, it is important to read all the questions and queries and answer them with credibility and objectivity, knowing that all the information that would be provided in this research will be treated confidentially and will be used only for the purpose of the scientific research.

Supervisor: Prof. Amer El Hamouz

Researcher: Eng. Hanan Tuhul

Tel: 00972599220351

E-mail: eng_h_tuhl@hotmail.com

Phase One: Employee's Information

Establishment Name: -----

Industrial sector: -----

1. **Employee's Gender:** ☐ A. Male ☐ B. Female

2. **Age Category:**

<input type="checkbox"/> A. < 16 YD*	<input type="checkbox"/> B. (16-20) YD*	<input type="checkbox"/> C. (21-25) YD*
<input type="checkbox"/> D. (26-30) YD*	<input type="checkbox"/> E. (31-35) YD*	<input type="checkbox"/> F. (36-40) YD*
	<input type="checkbox"/> G. > 40 YD*	

*(Years Old)

3. **Academic Qualification:** ☐ A. Less than secondary ☐ B. Secondary

☐ C. Diploma ☐ D. B.A ☐ E. Postgraduate

4. **Number of years of experience (in the field of work):**

<input type="checkbox"/> A. < A year	<input type="checkbox"/> B. (1-5) Ys*
<input type="checkbox"/> C. (6-10) Ys*	<input type="checkbox"/> E. > 10 Ys*

*(Years)

5. **Number of years of work (in the current workplace):**

<input type="checkbox"/> A. < A year	<input type="checkbox"/> B. (1-5) Ys*
<input type="checkbox"/> C. (6-10) Ys*	<input type="checkbox"/> E. > 10 Ys*

6. **Employee's Job Title:** -----
7. **Employee's Nature of Work:** -----
8. **Employee's Work Department:** -----

9. **Is there an Employment Contract between you and the establishment?**

<input type="checkbox"/> A. Yes	<input type="checkbox"/> B. No
---------------------------------	--------------------------------

10. **Shape of the Employment Contract:**

<input type="checkbox"/> A. Written	<input type="checkbox"/> B. Verbal
-------------------------------------	------------------------------------

11. **Nature of the Employment Contract:**

<input type="checkbox"/> A. Permanent	<input type="checkbox"/> B. Temporary
---------------------------------------	---------------------------------------

12. **Working Hours by Contract:** -----
13. **Actual Working Hours:** -----
14. **Number of Working Days/Week:** -----

15. **Work Timing:** ☐ A. Diurnal ☐ B. Nightly ☐ C. Both

Phase Two: OSH Information

A- Occupational Accidents & Diseases

Please put (X) in the answer box that suits you

16-	Are you insured against occupational accidents? <div style="background-color: yellow; display: inline-block; padding: 2px;">If No, the reason is:</div>	<input type="checkbox"/> A-Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-I do not know that I have a right to be insured against work accidents. <input type="checkbox"/> D-There is no employees' insurance in the establishment. <input type="checkbox"/> E-I do not care to be insured against occupational accidents. <input type="checkbox"/> F-Another reason, mention it: -----
17-	Have you ever been injured in your workplace? <div style="background-color: green; display: inline-block; padding: 2px;">If No, please go to question (25)</div> <div style="background-color: yellow; display: inline-block; padding: 2px;">If Yes, what is the nature of that accidents</div>	<input type="checkbox"/> A-Yes <input type="checkbox"/> B- NO C- -----
18-	What is the direct cause of the accident? <div style="background-color: #d3d3d3; display: inline-block; padding: 2px;">(Allows more than one option)</div>	<input type="checkbox"/> A-Non-use of personal protection and protection tools <input type="checkbox"/> B-Lack of arrangement and organization in the workplace <input type="checkbox"/> C- No machinery maintenance <input type="checkbox"/> D -The absence of guidance and warning signs around machines. <input type="checkbox"/> E-I do not know how to use the machines. <input type="checkbox"/> F-Carelessness by me or by one of my colleagues in the establishment <input type="checkbox"/> G-Fatigue and exhaustion <input type="checkbox"/> H-Ignorance of the danger sources of danger in the establishment <input type="checkbox"/> I-Performing tasks outside my work specialization <input type="checkbox"/> J-Another reason, mention it -----
19-	How severe was the injury?	<input type="checkbox"/> A-Minor <input type="checkbox"/> B- Medium <input type="checkbox"/> C-Major
20-	Have you been treated on	<input type="checkbox"/> A-Your personal expense <input type="checkbox"/> B-Employer's expense <input type="checkbox"/> C-Insurance expense <input type="checkbox"/> D-Another part's expense, mention it: ----- -----
21-	Have you informed your employer about the accident? <div style="background-color: green; display: inline-block; padding: 2px;">If No is, it is because</div>	<input type="checkbox"/> A-Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-You do not know that you have to <input type="checkbox"/> D-The injury did not require reporting. <input type="checkbox"/> E -It may adversely affect your job <input type="checkbox"/> F-Another reason, mention it -----

22-	The injury's consequences	<input type="checkbox"/> A-Full recovery and direct return to work <input type="checkbox"/> B-Full recovery after long absence from work <input type="checkbox"/> C-Change the nature of your job <input type="checkbox"/> D-Temporary partial disability <input type="checkbox"/> E-Permanent partial disability <input type="checkbox"/> F-Total permanent disability <input type="checkbox"/> G-Loss of your job
23-	Have you ever been compensated for an occupational injury? If Yes, the compensator was	<input type="checkbox"/> A-Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-Employer <input type="checkbox"/> D-Insurance Co.
24-	Have you ever resorted to government or non-governmental entities to demand your right after an occupational injury? If Yes, this entity was	<input type="checkbox"/> A-Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-General Union of Trade Unions <input type="checkbox"/> D-MOL <input type="checkbox"/> E-Higher Judiciary <input type="checkbox"/> H-Another entity, mention it: -----
25-	Have any of your working colleagues ever lost his right after an occupational injury?	<input type="checkbox"/> A-Yes <input type="checkbox"/> B- NO
26-	Do you suffer from any chronic diseases as a result of your work nature? If Yes, this disease is related to (Allows more than one option)	<input type="checkbox"/> A-Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-Respiratory system <input type="checkbox"/> D-Digestive system <input type="checkbox"/> E-Joints <input type="checkbox"/> F-Senses <input type="checkbox"/> G-Skin <input type="checkbox"/> H-Another choice, mention it -----
27-	Do you really think that your working environment is dangerous? If Yes, do you think the source of danger is (Allows more than one option)	<input type="checkbox"/> A-Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-Poor establishment's design and organization <input type="checkbox"/> D-Failure to provide protection and protection tools <input type="checkbox"/> E-Handle sharp tools <input type="checkbox"/> F-Dealing with hazardous chemicals <input type="checkbox"/> G-Working atmosphere (temperature, humidity, sun, etc. ...). <input type="checkbox"/> H-Working environment (ventilation, lighting, noise, etc.). <input type="checkbox"/> I-The presence of dust, gases and radiation emitted <input type="checkbox"/> J-Ignorance of danger <input type="checkbox"/> K-Another source, mention it -----
28-	Does the establishment provide adequate health services? If Yes, these services are (Allows more than one option)	<input type="checkbox"/> A-Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-Healthy drinking water <input type="checkbox"/> D-Wash basins <input type="checkbox"/> E-Sanitary toilets <input type="checkbox"/> F-Shower heads <input type="checkbox"/> G-Quiet break places

		<input type="checkbox"/> H-Healthy dining rooms <input type="checkbox"/> I-Changing rooms
29-	Does the establishment provide protection tools for its employees? If Yes, please specify these tools (Allows more than one option) If No, please go to question (32)	<input type="checkbox"/> A-Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-Glasses <input type="checkbox"/> D-Gloves for hands <input type="checkbox"/> E-Head helmets <input type="checkbox"/> F-Breathing respirators <input type="checkbox"/> G-Headphones <input type="checkbox"/> H-Protective clothing <input type="checkbox"/> I-Protective shoes
30-	Does the establishment provide special training on prevention and protection tools for employees? If Yes, is it provided	<input type="checkbox"/> A-Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-For once throughout the working period at the establishment <input type="checkbox"/> D-Once a year <input type="checkbox"/> E-Twice a year (once every 6 months) <input type="checkbox"/> F-Another choice, mention it: -----
31-	Does the establishment maintain the damaged equipment? If Yes, this happens	<input type="checkbox"/> A-Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-Once a year <input type="checkbox"/> D-Once every 6 months <input type="checkbox"/> E-Once every 3 months <input type="checkbox"/> F-Another choice, mention it: -----
32-	What are the reasons behind not providing prevention and protection tools for employees in the establishment? (Allows more than one option)	<input type="checkbox"/> A-Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-Their high price <input type="checkbox"/> D-Lack of external monitoring <input type="checkbox"/> E-Lack of employees' commitment toward using them <input type="checkbox"/> F-Employer's carelessness of OSH <input type="checkbox"/> G-Employees' carelessness toward demanding them <input type="checkbox"/> H-All of the above <input type="checkbox"/> I-Other reason, mention it -----

B- OSH Requirements

Please put (X) in the answer box that suits you

No.	Question	YES	NO
1.	Have you had a preliminary medical examination before starting your work at the establishment?		
2.	Do you undergo a periodic medical examination?		
3.	Is there a medical record for the employees in the establishment?		

4.	Have you been provided with identification and safety cards for equipment and hazardous materials?		
5.	Have you been given prior training on machines in the establishment?		
6.	Does the establishment periodically maintain machinery and equipment?		
7.	Does the establishment provide suction gases and harmful evaporation equipment in the workplace		
8.	Does the establishment provide obvious and visible warning signals in dangerous places?		
9.	Does the establishment provide an emergency evacuation plan on which you were trained?		
10.	Is there a first aid box in the establishment?		
11.	Is there a qualified resident paramedic in the establishment?		
12.	Does the establishment have emergency exits?		
13.	Do you know the locations of these exits (if any)?		
14.	Does the establishment contain alarm systems?		
15.	Do you know the sound of the alarm systems in the establishment?		
16.	Is there a fire system in the establishment?		
17.	Have you previously been trained on using the fire system?		
18.	Does the establishment provide obvious and visible emergency numbers in the workplace?		
19.	Do you know how to report an accident (if it occurs)?		
20.	Do you know the entity that you should report about the accident (if it occurs)?		
21.	Does the establishment's management investigate accidents?		
22.	Does the establishment conduct scouting tours to check the employees' commitment toward using safety tools?		
23.	Does the establishment punish uncommitted employees toward safety procedures?		
24.	Does the establishment set certain procedures to reduce occupational accidents and diseases?		
25.	Does the establishment involve its employees in the development of OSH?		

Phase Three: Information on awareness of danger sources and dealing with them

A- General Questions

Please put (X) in the answer box that suits you

33-	Have you participated in governmental and non-governmental training and awareness courses on occupational safety and health issues? If No, please go to Question (35) If Yes, the organizer was	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-The establishment itself <input type="checkbox"/> D-MOL <input type="checkbox"/> E-MOH <input type="checkbox"/> F-MOE (Ministry of Economic) <input type="checkbox"/> G-Trade unions <input type="checkbox"/> H-Another organizer, mention it: -----
34-	Based on your previous answer, what was/were the course(s) that you have participated in? (Allows more than one option)	<input type="checkbox"/> A-Fire Extinction <input type="checkbox"/> B-Risk Assessment <input type="checkbox"/> C-First Aid <input type="checkbox"/> D-Another course, mention it: -----
35-	Does the establishment provide any incentives to employees to reduce occupational accidents? In case your answer is Yes, these incentives are (Allows more than one option)	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-Financial Rewards <input type="checkbox"/> D-Promotions and Bonuses <input type="checkbox"/> E-Trips and Vacations <input type="checkbox"/> F-Moral Rewards <input type="checkbox"/> G-Other incentives, mention them: -----
36-	According to your information, did any monitoring governmental entity visit your establishment within one year? If Yes, this entity is (Allows more than one option)	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-MOL <input type="checkbox"/> D-MOH <input type="checkbox"/> E-MOE (Ministry of Environment) <input type="checkbox"/> F-MOE (Ministry of Economic) <input type="checkbox"/> G-Civil Defense

B- Awareness of OSH

Please put (X) in the answer box that suits you, **with attention to the meaning of the numbers**

No.	Question	(3) "To Certain Extent"	(2) "To Reasonable Extent"	(1) "To Zero Extent"
1.	To what extent you are at risk of noise			
2.	To what extent you are at risk of sharp and dangerous machines			
3.	To what extent you are at risk of dangerous radiation			
4.	To what extent you are at risk of toxic gases and emissions			

5.	To what extent you are exposed to atmospheric hazards (temperature, humidity, sun)			
6.	To what extent you think that lighting is appropriate in your workplace			
7.	To what extent you think that ventilation is appropriate in your workplace			
8.	To what extent you are at risk of sliding in your workplace			
9.	To what extent you are at risk of falling in your workplace			
10.	To what extent you are exposed to work under extreme pressure			
11.	To what extent you think that the distances between the machines are suitable in your workplace			
12.	To what extent you think that the design of emergency exits (if exist) is appropriate and safe in your workplace			
13.	To the extent you think that the establishment's location is appropriate and suitable for the nature of the industry			
14.	To what extent you assess your knowledge of the existence of the OSH procedures at your workplace?			
15.	To what extent you evaluate your compliance with OSH laws and regulations?			
16.	To what extent you assess your knowledge of OSH in general?			
17.	To what extent you think that "the enforcement of all necessary measures and procedures that provide a safe working environment" is one of your rights			
18.	To what extent you think that the establishment is keen to provide a safe working environment?			
19.	To what extent you believe that the establishment is keen to insure all employees			
20.	To what extent you believe that the establishment is keen to provide all its employees with their legal rights with respect to OSH			
21.	To what extent you think that the establishment is keen to raise the employees' awareness about OSH			
22.	To what extent you believe that the establishment is keen to comply with			

	the OSH requirements enforced by the labor law			
23.	To what extent you believe that the establishment is keen to inform the MOL of occupational accidents and injuries			

Phase Four: Information on Employees' view about the trade union role towards their OSH

Please put (X) in the answer box that suits you		
37-	Do you generally belong to any trade union? If No, go to Question (40) after mentioning the reason	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-The reasons are: ----- -----
38-	If you are a member of a trade union, have this association already established courses for employees with respect to OSH?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
39-	Do you think that the union you belong to has an efficient role in raising the employees' awareness about OSH and the potential occupational hazards?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
40-	Have you ever needed a direct intervention from the union to solve one of your OSH problems with your workplace? If Yes, did the union succeed in solving your problem in a way that suits you and ensure your right	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO <input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
41-	Do you think that the union members lack influence in front of employers?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO
42-	Do you think that the presence of trade unions contributes to the protection of employees and their rights with regard to OSH issues? If Yes, what are the desired benefits of the unions towards the employees	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO <input type="checkbox"/> C-The desired benefits: ----- ----- -----
43-	Do you personally know the union's leadership committee?	<input type="checkbox"/> A- Yes <input type="checkbox"/> B- NO

Thank you for your cooperation

Appendix (1C)

**الموضوع : بحث معلوماتي مكثف موجه لأصحاب المنشآت الصناعية و مرتبط برسالة ماجستير بعنوان
(تطوير إطار مفاهيمي للسلامة و الصحة المهنية في القطاعات التصنيعية في فلسطين)**

السادة أصحاب المنشآت الصناعية أو من ينوب عنهم الكرام

بعد التحية و التقدير

نشكركم لتخصيص جزء من وقتكم لإثراء هذا البحث المعلوماتي الذي يهدف إلى قراءة واقع الصحة والسلامة المهنية في المنشآت الصناعية في فلسطين و تحديداً في قطاعات الصناعات الغذائية، الكيماوية، المعدنية والهندسية، الخشبية والأثاث، البلاستيكية، الورقية والكرتون، الجلود والأحذية، وصناعة الألمنيوم ، و إنشاء مصدر معلوماتي دقيق و موثوق حول منشآتنا الصناعية و كل ما يتعلق بأمور السلامة و الصحة المهنية لديها.

هذا البحث سيستخدم لتعزيز و إثراء رسالة ماجستير بعنوان:

((تطوير إطار مفاهيمي للسلامة والصحة المهنية للقطاعات التصنيعية في فلسطين)).

ينقسم البحث إلى خمسة أقسام:

يهدف القسم الأول إلى الحصول على معلومات خاصة بالمنشأة الصناعية ، بينما يهدف القسم الثاني للتعرف على بيانات العاملين فيها . القسم الثالث يتناول متطلبات السلامة والصحة المهنية و توفرها في المنشأة الصناعية. و فيما يُعنى القسم الرابع بالحوادث و الأمراض المهنية فإن القسم الخامس يتناول جدولاً خاصاً حول احصائياتها في المنشآت.

قد يستغرق البحث بعضاً من وقتكم، لكننا نتمنى منكم قراءة جميع الأسئلة والاستفسارات و الإجابة عنها بمصداقية وموضوعية ،
علماً بأن كل ما سيأتي خلالها هو سري للغاية و لن يستخدم إلا لغرض البحث العلمي .

مشرف البحث :

أ. د عامر الهموز

الباحثة :

م . حنان طحل

أولاً: بيانات المنشأة

- اسم المنشأة الصناعية : -----
- سنة المنشأ (التأسيس) : -----
- اسم صاحب المنشأة / أو من ينوب عنه : -----
1. مؤهله الأكاديمي : ☐ أ- أقل من ثانوي ☐ ب- ثانوي ☐ ج- دبلوم ☐ د- بكالوريوس ☐ هـ- دراسات عليا
- عنوان المنشأة : -----
- رقم الهاتف : -----
- أ- ☐ مقر رئيسي ☐ ب- مقر فرعي
- البريد الإلكتروني : -----
2. القطاع الصناعي التابع له
- ☐ أ- الصناعات الغذائية والمشروبات ☐ ب- الصناعات الكيماوية ☐ ج- الصناعات المعدنية ☐ د- صناعات الورق و الكرتون ☐ هـ- صناعات الأحذية و الجلود ☐ و- صناعات الألمنيوم ☐ ز- الصناعات البلاستيكية ☐ ح- الصناعات الخشبية و الأثاث
3. عدد العمال (المعرضين للخطر) في المنشأة : -----
4. حجم رأس مال المنشأة (بالدينار الأردني)
- ☐ أ- أكثر من مليون ☐ ب- 250 ألف وأقل من مليون ☐ ج- 100 ألف وأقل من 250 ألف ☐ د- 40 ألف و أقل من 100 ألف ☐ هـ- 5000 و أقل من 40 ألف ☐ و- أقل من 5000
5. حجم المنشأة العمراني من حيث :
- أ- عدد المباني التابعة لها: -----
- ب- مساحة المباني: -----
- ج- المساحة الكلية: -----
6. حالة المنشأة : ☐ أ- مؤمن (ضد حوادث العمل) ☐ ب- غير مؤمن (ضد حوادث العمل)
7. اسم شركة التأمين المؤمن لديها: -----
8. توقيت العمل في المنشأة
- ☐ أ- نهاري ☐ ب- ليلي ☐ ج- كلاهما

بالاستعانة بقسم الموارد البشرية في المنشأة الرجاء الإجابة عن القسم التالي

ثانياً: بيانات العاملين في المنشأة

A. عدد العمال (المعرضين للخطر) في المنشأة تبعاً للعمر و الجنس

أكثر من 46	45 - 41	40 - 36	35 - 31	30 - 26	25 - 21	20 - 15	أقل من 15	الفئة العمرية الجنس
								ذكور
								إناث

B. عدد العمال (المعرضين للخطر) في المنشأة تبعاً للمؤهل الأكاديمي و الجنس

دكتوراه	ماجستير	بكالوريوس	ثانوي	اعدادي فأقل	أمي	المؤهل الأكاديمي الجنس
						ذكور
						إناث

C. عدد العمال (المعرضين للخطر) في المنشأة تبعاً لسنوات الخبرة و الجنس

21 فأكثر	20 - 17	16 - 13	12 - 9	8 - 5	4 - 2	سنة فأقل	سنوات الخبرة الجنس
							ذكور
							إناث

D. عدد العمال (المعرضين للخطر) في المنشأة تبعاً لمدة العقد و الجنس

مؤقت	دائم	مدة العقد الجنس
		ذكور
		إناث

E. عدد ساعات عمل العمال (المعرضين للخطر) في المنشأة

سنة	شهر	أسبوع	يوم	المدة
				عدد الساعات

ثالثاً: متطلبات السلامة و الصحة المهنية

يرجى التكرم بوضع إشارة (X) في مربع الإجابة التي تناسبك	
9-	هل لدى المنشأة شهادة دولية معترف بها فيما يتعلق بالسلامة و الصحة المهنية في حال كانت الإجابة (نعم)، يرجى ذكر اسمها و نوعها
10-	هل تلتزم المنشأة بتطبيق قوانين و اجراءات السلامة المهنية المنصوص عليها من قبل قانون العمل الفلسطيني
11-	هل تحتوي المنشأة على نسخة من تشريعات السلامة الواجب الالتزام بها طبقاً للقانون
12-	هل يوجد في المنشأة جهاز أو قسم خاص بأمور السلامة و الصحة المهنية للعاملين
13-	هل يوجد شخص مؤهل للإشراف على أمور السلامة و الصحة المهنية في المنشأة
14-	هل يخضع العاملون لفحص طبي أولي قبل التوظيف في المنشأة
15-	هل يخضع العاملون لفحص طبي دوري أثناء إقترانهم بالمنشأة
16-	هل يخضع العاملون لخدمات طبية وقائية (كالتلطيم الوقائي)
17-	هل توفر المنشأة خدمات صحية للعاملين فيها في حال كانت الإجابة (نعم) الرجاء تحديد نوع هذه الخدمات (يسمح بأكثر من خيار)
18-	هل المنشأة مزودة بالإسعاف الأولي
19-	هل يوجد طبيب مقيم في المنشأة
20-	هل توفر المنشأة فترات استراحة للعاملين فيها في حال كانت الإجابة (نعم)، يرجى تحديد
21-	هل يوجد مساحات مخصصة لاستراحة العمال في المنشأة
22-	هل يوجد أرقام هواتف ظاهره و مرئية لمراكز الطوارئ في المنشأة للتواصل معها في حال وقوع حوادث مهنية
23-	هل يوجد لوحات و ملصقات خاصة بالسلامة و الصحة المهنية ظاهره و مرئية في المنشأة

24-	هل يوجد بطاقات تعريفية للآلات و طريقة استخدامها بالقرب منها في المنشأة	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا
25-	هل يوجد ارشادات و تعليمات خاصة بالسلامة و الصحة المهنية للآلات ظاهره و مرئية في المنشأة	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا
26-	هل تتم صيانة دورية للآلات في المنشأة في حال كانت الإجابة (نعم)، فما هي الفترة بين كل صيانة و أخرى للآلات	<input type="checkbox"/> أ-نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- 6 أشهر <input type="checkbox"/> د- 12 شهر <input type="checkbox"/> هـ- 18 شهر <input type="checkbox"/> و- أكثر من ذلك <input type="checkbox"/> ز- خيار آخر اذكره: -----
27-	هل يخضع العاملین لتدريب مسبق على الآلات قبيل استخدامها	<input type="checkbox"/> أ-نعم <input type="checkbox"/> ب- لا
28-	هل يوجد مخارج طوارئ ظاهره و مرئية في المنشأة	<input type="checkbox"/> أ-نعم <input type="checkbox"/> ب- لا
29-	هل يوجد خطة إخلاء مقرررة في المنشأة في حالة حدوث حوث	<input type="checkbox"/> أ-نعم <input type="checkbox"/> ب- لا
30-	هل يتم تدريب العاملين في المنشأة على خطة الإخلاء	<input type="checkbox"/> أ-نعم <input type="checkbox"/> ب- لا
31-	هل المنشأة مزودة بأجهزة انذار كشف وتسرب الغازات	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا
32-	هل العاملون في المنشأة مدربون على استخدام وسائل مكافحة الحريق	<input type="checkbox"/> أ-نعم <input type="checkbox"/> ب- لا
33-	عدد العاملين المؤمنين في المنشأة	<input type="checkbox"/> أ- لا أحد (صفر) <input type="checkbox"/> ب- من (1-5) عمال <input type="checkbox"/> ج- من (6-10) عمال <input type="checkbox"/> د- من (11-15) عامل <input type="checkbox"/> هـ- من (16-20) عامل <input type="checkbox"/> و- من (21-25) عامل <input type="checkbox"/> ز- من (26-30) عامل <input type="checkbox"/> ح- 31 عامل فأكثر
34-	هل توفر المنشأة متطلبات السلامة و الصحة المهنية اللازمة للعاملين في حال كانت الإجابة (نعم)، فالرجاء ذكر متطلبات السلامة المتوفرة في المنشأة	<input type="checkbox"/> أ-نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- متطلبات السلامة المتوفرة في المنشأة هي: ----- -----
35-	هل يخضع العاملین لدورات تدريبية متخصصة أثناء اقترانهم بالمنشأة في حال كانت الإجابة (نعم) الرجاء ذكر أمثلة للدورات	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- الدورات: ----- -----
36-	هل تتابع المنشأة التزام العاملين بمتطلبات السلامة و الصحة المهنية	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا
37-	هل هناك مخلفات معينة تصدر عن المنشأة في حال كانت الإجابة (نعم)، ما هو نوع هذه المخلفات، و ما هي طريقة التخلص منها	<input type="checkbox"/> أ-نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- غازية <input type="checkbox"/> د- صلبة <input type="checkbox"/> هـ- سائلة <input type="checkbox"/> و- طريقة التخلص: -----

رابعاً : الحوادث و الأمراض المهنية

يرجى التكرم بوضع إشارة (X) في مربع الإجابة التي تناسبك	
38-	عدد حوادث العمل الواقعة في المنشأة خلال العام الأخير <input type="checkbox"/> أ- من (1-5) حوادث <input type="checkbox"/> ب- من (6-10) حوادث <input type="checkbox"/> ج- من (11-15) حادث <input type="checkbox"/> د- من (16-20) حادث <input type="checkbox"/> هـ- أكثر من ذلك
39-	عدد مرات تكرار حوادث العمل خلال الشهر <input type="checkbox"/> أ- 0 مرة <input type="checkbox"/> ب- من (1 - 3) مرات <input type="checkbox"/> ج- من (4-6) مرات <input type="checkbox"/> د- أكثر من ذلك
40-	أسباب تكرار حوادث العمل تلك <input type="checkbox"/> أ- عدم استخدام أدوات الوقاية والحماية الشخصية. <input type="checkbox"/> ب- غياب الترتيب والتنظيم في موقع العمل. <input type="checkbox"/> ج- عدم إجراء صيانة للآلات. <input type="checkbox"/> د- عدم وجود لوحات إرشاد و تحذير حول الآلات. <input type="checkbox"/> هـ- عدم معرفة بعض العاملين بطريقة استخدام الآلات. <input type="checkbox"/> و- إهمال من قبل العاملين في المنشأة <input type="checkbox"/> ز- التعب و الإرهاق الذي يعاني منه العاملين في المنشأة. <input type="checkbox"/> ح- جهل العاملين بمصادر الخطر الموجوده في المنشأة <input type="checkbox"/> ط- قيام العمال بمهام خارج نطاق تخصصهم و عملهم. <input type="checkbox"/> ي- سبب آخر : اذكره -----
41-	عدد المصابين بحوادث العمل خلال العام الأخير <input type="checkbox"/> أ- من (1-5) مصابين <input type="checkbox"/> ب- من (6-10) مصابين <input type="checkbox"/> ج- من (11-15) مصابين <input type="checkbox"/> د- من (16-20) مصابين <input type="checkbox"/> هـ- أكثر من ذلك
42-	عدد المصابين بأمراض مهنية خلال العام الأخير <input type="checkbox"/> أ- من (1-5) مصابين <input type="checkbox"/> ب- من (6-10) مصابين <input type="checkbox"/> ج- من (11-15) مصابين <input type="checkbox"/> د- من (16-20) مصابين <input type="checkbox"/> ذ- هـ- أكثر من ذلك
43-	هل يوجد سجل إصابات للحوادث المهنية في المنشأة <input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا
44-	هل يوجد سجل للوفيات المهنية في المنشأة <input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا
45-	هل يوجد سجل للأمراض المهنية في المنشأة <input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا
46-	عدد غيابات عمال المنشأة بسبب الحوادث المهنية خلال العام الأخير <input type="checkbox"/> أ- أقل من 5 أيام <input type="checkbox"/> ب- من (5-10) أيام <input type="checkbox"/> ج- من (11-15) يوم <input type="checkbox"/> د- من (16-20) يوم <input type="checkbox"/> هـ- من (21-25) يوم <input type="checkbox"/> و- من (26-30) يوم <input type="checkbox"/> ز- 31 يوم فأكثر

<p>47- خسائر إضافية ملحقه بالحوادث تعرضت لها المنشأة (يسمح بأكثر من خيار)</p>	<p><input type="checkbox"/> أ- تعويضات عاملين <input type="checkbox"/> ب- توقف عملية الانتاج <input type="checkbox"/> ج- آلات وممتلكات <input type="checkbox"/> د- مهارات وخبرات <input type="checkbox"/> هـ- تكاليف تدريبية على الآلات <input type="checkbox"/> و- تكاليف تدريبية على أدوات السلامة (إن وجدت) <input type="checkbox"/> ز- ارتفاع تكاليف بوليصة التأمين بسبب زيادة الحوادث <input type="checkbox"/> ح- خيار آخر اذكره: -----</p>
<p>48- هل يتم التبليغ عن الحوادث في حال كانت الإجابة (لا)، انتقل لسؤال (52) في حال كانت الإجابة السابقة (نعم)، حدد عدد الحوادث التي تم التبليغ عنها في المنشأة</p>	<p><input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- من (1-5) حوادث <input type="checkbox"/> د- من (6-10) حوادث <input type="checkbox"/> هـ- من (11-15) حادث <input type="checkbox"/> و- من (16-20) حادث <input type="checkbox"/> ز- أكثر من ذلك</p>
<p>49- الجهة التي تم تبليغها (يسمح بأكثر من خيار)</p>	<p><input type="checkbox"/> أ- وزارة العمل <input type="checkbox"/> ب- شركة التأمين <input type="checkbox"/> ج- الشرطة <input type="checkbox"/> د- وزارة الصحة <input type="checkbox"/> هـ- الدفاع المدني <input type="checkbox"/> و- جهة أخرى: اذكرها -----</p>
<p>50- هل تم فتح تحقيق في الحوادث</p>	<p><input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا</p>
<p>51- هل يوجد نماذج للتحقيق في الحوادث المهنية و أسبابها في المنشأة في حال كانت الإجابة (نعم)، يرجى ارفاق نسخه عن النموذج مع الاستبيان عبر الايميل</p>	<p><input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا</p>
<p>52- هل تم اتخاذ اجراءات معينة في المنشأة بعد وقوع الحوادث لمنع تكرارها في حال كانت الإجابة (نعم)، الرجاء ذكر هذه الإجراءات</p>	<p><input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- إجراءات ما بعد الحادث : ----- ----- ----- -----</p>
<p>53- هل هناك اجراءات تتخذها المنشأة لتحفيز العاملين على تقليل ومنع الحوادث فيها في حال كانت الإجابة (نعم)، اذكر بعض هذه الإجراءات</p>	<p><input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- إجراءات تقليل الحوادث : ----- -----</p>
<p>54- هل خضعت المنشأة للتفتيش من قبل جهات مختصة بأمور السلامة والصحة المهنية في حال كانت الإجابة (نعم)، الرجاء ذكر اسم الجهة المفتشة</p>	<p><input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- الجهة المفتشة هي : -----</p>

<p>55- عدد مرات التفتيش التي خضعت لها المنشأة خلال العام الاخير</p>	<p><input type="checkbox"/> أ- صفر <input type="checkbox"/> ج- من (2-4) مرات <input type="checkbox"/> د- من (5-7) مرات <input type="checkbox"/> هـ- أكثر من ذلك</p>
<p>56- آخر كشف خضعت له المنشأة من قبل جهة مختصه كان قبل</p>	<p><input type="checkbox"/> أ- أقل من شهر <input type="checkbox"/> ج- (5 - 8) شهر <input type="checkbox"/> ب- (1-4) شهر <input type="checkbox"/> د- (9-12) شهر <input type="checkbox"/> هـ- أكثر من سنة</p>
<p>57- هل سبق و تم إغلاق المنشأة لأمر تتعلق بالسلامة و الصحة المهنية</p>	<p><input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا</p>
<p>58- هل تهتم المنشأة بوضع استراتيجيات لتقليل الحوادث و الأمراض</p>	<p><input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا</p>
<p>59- هل هناك أي تعاون ما بين المنشأة و جهات حكوميه و غير حكوميه لتقليل عدد الحوادث في حال كانت الإجابة (نعم)، الرجاء ذكر اسم الجهة</p>	<p><input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- الجهة المتعاونة :----- -----</p>

خامساً : احصائيات الشركة فيما يتعلق بالحوادث و الامراض المهنية

بالرجوع لسجلات المنشأة و تحديداً الفترة الواقعة ما بين الاعوام (2009 - 2016) يرجى تعبئة الجدول التالي

العدد العام	عدد الموظفين الثابتين	عدد الحوادث المهنية	عدد الاصابات	عدد الوفيات	عدد العمال الذين تعرضوا لأمراض مهنية	نوع المرض	عدد أيام الغياب نتيجة الحوادث	حجم الخسائر المادية (بالدولار) المقدرة بسبب الحوادث
2009								
2010								
2011								
2012								
2013								
2014								
2015								
2016								

شكراً لحسن تعاونكم

Appendix (1D)

الموضوع : بحث معلوماتي مكثف موجه للعاملين في المنشآت الصناعية و مرتبط برسالة ماجستير بعنوان
(تطوير إطار مفاهيمي للسلامة و الصحة المهنية في القطاعات التصنيعية في فلسطين)

الأخوات و الأخوه / عاملاتنا و عاملينا المحترمين :

نشكركم لتخصيص جزء من وقتكم لإثراء هذا البحث المعلوماتي الذي يهدف إلى قراءة واقع الصحة والسلامة المهنية في المنشآت الصناعية في فلسطين، و تحديداً قطاعات الصناعات الغذائية، الكيميائية، المعدنية والهندسية، الخشبية والأثاث، البلاستيكية، الورقية والكرتون، الجلود والأحذية، وصناعة الألمنيوم ، و إنشاء مصدر معلوماتي دقيق و موثوق حول عمالنا الكرام و ظروف السلامة و الصحة المهنية التي يعملون في ظلها.))

هذا البحث سيستخدم لتعزيز و إثراء رسالة ماجستير بعنوان:

((تطوير إطار مفاهيمي للسلامة والصحة المهنية للقطاعات التصنيعية في فلسطين)).

ينقسم البحث إلى أربعة أقسام رئيسية

في حين يُعنى القسم الأول بالحصول على معلومات عامه حول عاملينا الكرام، يتطلع القسم الثاني للتعرف على بعض من واقع السلامة و الصحة المهنية التي يعايشها العاملون في المنشآت محور الدراسة. القسم الثالث يتمحور حول تحديد مدى وعي العاملين بمصادر المخاطر و طريقة التعامل معها. أما القسم الرابع و الأخير فيهدف لاستبيان وجهة نظر العاملين حول الدور النقابي تجاه صحتهم و سلامتهم المهنية.

قد يستغرق البحث بعضاً من وقتكم، لكننا نتمنى منكم قراءة جميع الأسئلة والاستفسارات و الإجابة عنها بمصداقية وموضوعية ،
علماً بأن كل ما سيأتي خلالها هو سري للغاية و لن يستخدم إلا لغرض البحث العلمي .

مشرف البحث :

أ. د عامر الهموز

الباحثة :

م . حنان طحل

القسم الأول : البيانات العامة عن العامل و المنشأة

اسم المنشأة : ----- قطاع العمل : -----

1. جنس العامل : ☐ أ- ذكر ☐ ب- أنثى
2. الفئة العمرية : ☐ أ- أقل من 16 عاما ☐ ب- (16 - 20) عاما ☐ ج- (21 - 25) عاما ☐ د- (26 - 30) عاما ☐ هـ- (31 - 35) عاما ☐ و- (36 - 40) عاما ☐ ز- 40 عاما فأكثر
3. المؤهل الأكاديمي : ☐ أ- أقل من ثانوي ☐ ب- ثانوي ☐ ج- دبلوم ☐ د- بكالوريوس ☐ هـ- دراسات عليا
4. عدد سنوات خبره في مجال العمل : ☐ أ- أقل من عام ☐ ب- من (1-5) سنوات ☐ ج- من (6-10) سنوات ☐ د- أكثر من 10 سنوات
5. عدد سنوات العمل (في مكان العمل الحالي): ☐ أ- أقل من عام ☐ ب- من (1 - 5) سنوات ☐ ج- من (6-10) سنوات ☐ د- أكثر من 10 سنوات
6. المسمى الوظيفي للعامل : -----
7. طبيعة العمل الذي تقوم به : -----
8. القسم من المنشأة التابع له : -----
9. هل يوجد عقد عمل بينك و بين المنشأة: ☐ أ- نعم ☐ ب- لا
10. طبيعة عقد العمل : ☐ أ- مكتوب ☐ ب- شفهي
11. نوع عقد العمل : ☐ أ- دائم ☐ ب- مؤقت
12. عدد ساعات العمل حسب العقد : -----
13. عدد ساعات العمل الفعلية : -----
14. عدد أيام العمل في الأسبوع : -----
15. توقيت عملك في المنشأة : ☐ أ- نهاري ☐ ب- ليلي ☐ ج- كلاهما تبعا للورديه

القسم الثاني : البيانات متعلقة بالسلامة و الصحة المهنية

أ- الحوادث و الأمراض المهنية		
يرجى التكرم بوضع إشارة (X) في مربع الإجابة التي تناسبك		
16-	هل أنت مؤمن ضد حوادث العمل	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- لا أعلم أن من حقي أن أكون مؤمناً ضد حوادث العمل. <input type="checkbox"/> د- لا يوجد تأمين للعمال ضمن شروط العمل في المنشأة. <input type="checkbox"/> هـ- لا أهتم بأن أكون مؤمن ضد حوادث العمل. <input type="checkbox"/> و- سبب آخر اذكره: -----
17-	هل سبق و تعرضت لإصابة في مكان عملك في حال كانت الإجابة (لا)، الرجاء الانتقال مباشرة لسؤال (25)	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- ----- في حال كانت الإجابة (نعم)، ما هو طبيعة الحادث الذي عرضت له
18-	ما هو السبب المباشر للحادث (يسمح بأكثر من خيار)	<input type="checkbox"/> أ- عدم استخدام أدوات الوقاية والحماية الشخصية. <input type="checkbox"/> ب- غياب الترتيب والتنظيم في موقع العمل. <input type="checkbox"/> ج- عدم إجراء صيانة للآلات. <input type="checkbox"/> د- عدم وجود لوحات إرشاد و تحذير حول الآلات. <input type="checkbox"/> هـ- عدم معرفتي بطريقة استخدام الآلات. <input type="checkbox"/> و- إهمال من قبلي أو من قبل أحد العاملين معي في المنشأة <input type="checkbox"/> ز- التعب و الإرهاق. <input type="checkbox"/> ح- الجهل بمصادر الخطر الموجوده في المنشأة <input type="checkbox"/> ط- القيام بمهام خارج نطاق تخصصي و عملي. <input type="checkbox"/> ي- سبب آخر : اذكره -----
19-	ما هي شدة الإصابة التي تعرضت لها	<input type="checkbox"/> أ- بسيطة <input type="checkbox"/> ب- متوسطة <input type="checkbox"/> ج- بليغة
20-	هل تم علاجك على	<input type="checkbox"/> أ- نفقتك الشخصية <input type="checkbox"/> ب- نفقة صاحب العمل <input type="checkbox"/> ج- التأمين <input type="checkbox"/> د- جهة أخرى: اذكرها ----- -
21-	هل قمت بإبلاغ مسؤولك في العمل عن الحادث في حال كانت الإجابة (لا)، هل ذلك بسبب	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- أنك لا تعلم بضرورة ذلك. <input type="checkbox"/> د- لأن الإصابة لم تستدعي الإبلاغ عنها.

	<input type="checkbox"/> ه- لأن ذلك قد يؤثر ذلك سلباً على عملك. <input type="checkbox"/> و- سبب آخر: اذكره -----	
-22	نتائج الإصابة التي تعرضت لها كانت	<input type="checkbox"/> أ- شفاء تام وعودة مباشرة للعمل. <input type="checkbox"/> ب- شفاء تام بعد غياب طويل عن العمل. <input type="checkbox"/> ج- تغيير طبيعة عملك. <input type="checkbox"/> د- عجز جزئي مؤقت. <input type="checkbox"/> ه- عجز جزئي دائم. <input type="checkbox"/> و- عجز كلي دائم. <input type="checkbox"/> ز- خسارة وظيفتك.
-23	هل سبق و حصلت على تعويض عن إصابة عمل في حال كانت الإجابة (نعم)، الجهة المعوضة كانت	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- صاحب العمل <input type="checkbox"/> د- التأمين
-24	هل سبق و لجأت لجهات حكومية أو غير حكومية لتحصيل حَقك بعد تعرضك لإصابة عمل في حال كانت الإجابة (نعم)، الجهة هي :	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- الاتحاد العام لنقابات العمال. <input type="checkbox"/> د- وزارة العمل. <input type="checkbox"/> ه- القضاء العالي. <input type="checkbox"/> و- جهة أخرى : اذكرها -----
-25	هل سبق و خسر احد زملائك العاملين حقه بعد تعرضه لإصابة عمل	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا
-26	هل بت تعاني من أي من الامراض المزمنة نتيجة عملك في حال كانت الإجابة (نعم)، فإن هذا المرض يتعلق بـ (يسمح بأكثر من خيار)	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- الجهاز التنفسي. <input type="checkbox"/> د- الجهاز الهضمي. <input type="checkbox"/> ه- المفاصل. <input type="checkbox"/> و- الحواس. <input type="checkbox"/> ز- الجلد. <input type="checkbox"/> ح- غير ذلك : اذكره -----
-27	هل تعتقد فعلا ان بيئة عملك خطره في حال كانت الإجابة (نعم)، هل تعتقد أن مصدر الخطر هو: (يسمح بأكثر من خيار)	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- سوء تصميم و تنظيم المنشأة. <input type="checkbox"/> د- عدم توفير أدوات الوقاية و الحماية. <input type="checkbox"/> ه- التعامل مع الأدوات الحادة. <input type="checkbox"/> و- التعامل مع مواد كيميائية خطره. <input type="checkbox"/> ز- البيئة الجويه (حراره ، رطوبه ، الشمس ، ... الخ). <input type="checkbox"/> ح- البنية العملية (التهوية ، الإضاءة ، الضوضاء الخ). <input type="checkbox"/> ط- وجود الأتربة و الغازات و الإشعاعات المنبعثة. <input type="checkbox"/> ي- الجهل بالخطر بحد ذاته. <input type="checkbox"/> ك- سبب آخر: اذكره -----
-28	هل توفر المنشأة خدمات صحية مناسبة	<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- مياه شرب صحية <input type="checkbox"/> د- أحواض غسل

<input type="checkbox"/> هـ- دورات مياه صحيه <input type="checkbox"/> و- أدشاش استحمام <input type="checkbox"/> ز- أماكن استراحه هادئه <input type="checkbox"/> ح- أماكن مناسبة للطعام <input type="checkbox"/> ط- غرف تغيير ملابس	في حال كانت الإجابة (نعم)، هذه الخدمات هي (يسمح بأكثر من خيار)	
<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- نظارات للأعين <input type="checkbox"/> د- قفازات للأيدي <input type="checkbox"/> هـ- خوذ رأسية <input type="checkbox"/> و- كمادات للتنفس <input type="checkbox"/> ز- سماعات للأذن <input type="checkbox"/> ح- ملابس واقية <input type="checkbox"/> ط- أحذية واقية	هل توفر المنشأة أدوات الوقاية و الحماية للعاملين فيها في حال كانت الإجابة (نعم)، الرجاء تحديد نوع الأدوات (يسمح بأكثر من خيار) في حال كانت الإجابة (لا) الرجاء الانتقال للسؤال (32)	29-
<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- لمرة واحدة فقط طوال فترة العمل في المنشأة <input type="checkbox"/> د- مره في سنة <input type="checkbox"/> هـ- مرتين في السنه (مره كل 6 أشهر) <input type="checkbox"/> و- خيار آخر: اذكره -----	هل توفر المنشأة تدريباً خاصاً على أدوات الوقاية و الحماية للعاملين في حال كانت الإجابة (نعم)، هل يكون هذا التدريب	30-
<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- لمرة واحدة فقط في السنه <input type="checkbox"/> د- مره كل 6 أشهر <input type="checkbox"/> هـ- مره كل 3 أشهر <input type="checkbox"/> و- خيار آخر: اذكره -----	هل تقوم المنشأة بإجراء صيانة لمعدات الوقاية واستبدال التالف منها في حال كانت الإجابة (نعم)، تكون عملية الصيانة	31-
<input type="checkbox"/> أ- لأن ثمنها مرتفع. <input type="checkbox"/> ب- لغياب الرقابه الخارجية. <input type="checkbox"/> ج- لعدم التزام العاملين بارتدائها. <input type="checkbox"/> د- لعدم اهتمام صاحب العمل بأمر السلامة. <input type="checkbox"/> هـ- لعدم اكتراث العمال بالمطالبة بها. <input type="checkbox"/> و- جميع ما ذكر <input type="checkbox"/> ز- سبب آخر: اذكره -----	ماهو السبب / الأسباب لعدم توفير أدوات الوقاية و الحماية للعاملين في المنشأة (يسمح بأكثر من خيار)	32-

ب- متطلبات السلامة المهنية يرجى التكرم بوضع إشارة (X) في مربع الإجابة التي تناسبك			
الرقم	السؤال	نعم	لا
1.	هل خضعت لفحص طبي أولي قبل البدء بعملك في المنشأة		
2.	هل تخضع لفحص طبي دوري		
3.	هل يوجد سجل طبي للعاملين في المنشأة		

4.	هل تم تزويدك ببطاقات التعريف و السلامة الخاصه بالأجهزة و المواد الخطرة	
5.	هل خضعت لتدريب مسبق على عمل الأجهزة و الآلات في المنشأة	
6.	هل تقوم المنشأة بعمل صيانة دورية للآلات و المعدات	
7.	هل توفر المنشأة أجهزة لشفط الغازات و الابخره الضاره في مكان العمل	
8.	هل توفر المنشأة إشارات تحذيرية واضحة و مرئية في الأماكن الخطره	
9.	هل توفر المنشأة خطة طوارئ لعمليات الإخلاء و تم تدريبك عليها	
10.	هل يوجد صندوق إسعاف أولي مجهز في المنشأة	
11.	هل يوجد مسعف مؤهل مقيم في المنشأة	
12.	هل تحتوي المنشأة على مخارج طوارئ	
13.	هل تعلم مواقع هذه المخارج (إن وجدت)	
14.	هل تحتوي المنشأة على أجهزة إنذار	
15.	هل تعرف طبيعة صوت جهاز الإنذار الموجود في المنشأة	
16.	هل يوجد نظام حريق في المنشأة	
17.	هل سبق و خضعت لتدريب مسبق على كيفية استخدام نظام الحريق	
18.	هل توفر المنشأة ارقام للطوارئ واضحة و مرئية للجميع	
19.	هل تعلم كيفية الإبلاغ عن حادث في حالة وقوعه في المنشأة	
20.	هل تعرف من هي الجهة التي يجب أن تقوم بتبليغها في حال وقوع حادث	
21.	هل تحقق إدارة المنشأة في الحوادث	
22.	هل تقوم المنشأة بجولات كشفية عن التزام العاملين بأدوات السلامة	
23.	هل تعاقب المنشأة العاملين الغير ملتزمين بإجراءات السلامة	
24.	هل تضع المنشأة اجراءات معينة لتقليل الحوادث و الأمراض المهنية	
25.	هل تشرك المنشأة العاملين في تطوير أمور السلامة و الصحة المهنية	

القسم الثالث : البيانات المتعلقة بالوعي بمصادر المخاطر وطريقة التعامل معها

أ- أسئلة عامة:	
يرجى التكرم بوضع إشارة (X) في مربع الإجابة التي تناسبك	
<p>33- هل شاركت بدورات تدريبية وتوعوية حكومية / غير حكومية بما يتعلق بأمور السلامة و الصحة المهنية في حال كانت الإجابة (لا)، الرجاء الانتقال للسؤال (35)</p>	<p> <input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- المنشأة نفسها <input type="checkbox"/> د- وزارة العمل <input type="checkbox"/> هـ- وزارة الصحة <input type="checkbox"/> و- وزارة الاقتصاد <input type="checkbox"/> ز- النقابات العمالية </p>

<input type="checkbox"/> ح - جهة أخرى: اذكرها -----		في حال كانت الإجابة (نعم)، الجهة المنظمة كانت		
<input type="checkbox"/> أ- إطفاء حريق <input type="checkbox"/> ب- تقييم مخاطر <input type="checkbox"/> ج- إسعاف أولي <input type="checkbox"/> د- أخرى: اذكرها -----		34- بناءً على إجابتك السابقة ، ما هو نوع الدورة التي خضعت لها (يسمح بأكثر من خيار)		
<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- مكافآت مالية <input type="checkbox"/> د- ترقيات و علاوات <input type="checkbox"/> هـ- رحلات و إجازات <input type="checkbox"/> و- مكافآت معنوية <input type="checkbox"/> ز- حوافز أخرى: اذكرها ----- -		35- هل تقدم المنشأة أية حوافز للعاملين لتقليل الحوادث المهنية في حال كانت إجابتك (نعم)، هذه الحوافز مثل (يسمح بأكثر من خيار)		
<input type="checkbox"/> أ- لا <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- وزارة العمل <input type="checkbox"/> د- وزارة الصحة <input type="checkbox"/> هـ- وزارة البيئة <input type="checkbox"/> و- وزارة الاقتصاد <input type="checkbox"/> ز- الدفاع المدني		36- حسب معلوماتك، هل قامت أي جهة رقابية حكومية بزيارة المنشأة التي تعمل بها خلال عام إذا كانت إجابتك (نعم)، هذه الجهة هي (يسمح بأكثر من خيار)		
ب- الوعي بالسلامة والصحة المهنية يرجى التكرم بوضع إشارة (X) في مربع الإجابة التي تناسبك مع ضرورة الانتباه لمعنى الأرقام				
الرقم	السؤال	(3) "إلى حد كبير"	(2) "إلى حد ما"	(1) "مطلقاً"
1.	إلى أي حد أنت معرض لخطر الضوضاء			
2.	إلى أي حد أنت معرض لخطر الآلات الحادة و الخطره			
3.	إلى أي حد أنت معرض لخطر الإشعاعات الخطره			
4.	إلى أي حد أنت معرض لخطر الغازات الأبخرة و الانبعاثات السامة			
5.	إلى أي حد أنت معرض للمخاطر الجويه (الحرارة ، الرطوبة ، الشمس)			
6.	إلى أي حد تعتقد أن الإضاءة مناسبة في مكان عملك			
7.	إلى أي حد تعتبر التهوية مناسبة في مكان عملك			
8.	إلى أي حد أنت معرض لخطر الانزلاق في مكان عملك			
9.	إلى أي حد أنت معرض لخطر السقوط في مكان عملك			
10.	إلى أي حد أنت معرض للعمل تحت الضغط الشديد			
11.	إلى أي حد تعتبر المسافات بين الآلات مناسبة في مكان عملك			
12.	إلى أي حد تعتبر أن تصميم مخارج الطوارئ مناسب و آمن في مكان عملك (إن وجدت)			

13.	إلى أي حد تعتبر أن موقع المنشأة مناسب لطبيعة الصناعة		
14.	إلى أي حد تقيم معرفتك بوجود تدابير السلامة و الصحة المهنية في موقع عملك		
15.	إلى أي حد تقيم التزامك بقوانين و أدوات السلامة المهنية		
16.	إلى أي حد تقيم معرفتك بأمور السلامة و الصحة المهنية		
17.	إلى أي حد تعتقد أن اتخاذ التدابير و الإجراءات اللازمة لتوفير بيئة عمل آمنة هو حق من حقوقك		
18.	إلى أي حد تعتقد أن المنشأة حريصة على توفير بيئة عمل آمنة		
19.	إلى أي حد تعتقد أن المنشأة حريصة على تأمين كافة العاملين بها		
20.	إلى أي حد تعتقد أن المنشأة حريصة على أن يعرف العاملون حقوقهم القانونية بما يتعلق بالسلامة و الصحة المهنية		
21.	إلى أي حد تعتقد أن المنشأة حريصة على توعية العاملين حول أمور السلامة و الصحة المهنية		
22.	إلى أي حد تعتقد أن المنشأة حريصة على الالتزام بمتطلبات السلامة و الصحة المهنية التي يقرها قانون العمل		
23.	إلى أي حد تعتقد أن المنشأة حريصة على إبلاغ وزارة العمل بالحوادث و الإصابات		

القسم الرابع : البيانات المتعلقة بنظرة العاملين للدور النقابي تجاه صحتهم و سلامتهم المهنية

يرجى التكرم بوضع إشارة (X) في مربع الإجابة التي تناسبك	
37-	هل تنتمي بشكل عام لنقابة عمال / نقابة مهنية
<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا	في حال كانت الإجابة (لا)، انتقل للسؤال (40) بعد ذكر السبب
<input type="checkbox"/> ج- الأسباب: _____ _____	

<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا	38- في حال كنت عضواً في نقابة عمالية ، هل سبق و أقامت النقابة دورات للعمال فيما يتعلق بالسلامة و الصحة المهنية
<input type="checkbox"/> أ- <input type="checkbox"/> نعم ب- لا	39- هل تعتقد أن النقابة التي تنتمي لها لها دور فاعل في توعية العمال بما يتعلق بالسلامة و الصحة المهنية و المخاطر المهنية المحتملة
<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- نعم <input type="checkbox"/> د- لا	40- هل سبق و احتجت إلى تدخل صريح من النقابة في حل إحدى مشاكلك المتعلقة بالسلامة و الصحة المهنية مع مكان عملك في حال كانت الإجابة (نعم)، هل استطاعت النقابة حل مشكلتك بطريقة تنصفك و تمنحك حقك
<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- لا أعلم	41- هل تعتقد بأن أعضاء النقابة يفقدون نفوذهم أمام أصحاب العمل
<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا <input type="checkbox"/> ج- لا أعلم ج- المزايا: ----- ----- -----	42- هل تعتقد أن وجود النقابات العمالية يساهم بحماية العمال وحقوقهم فيما يتعلق بقضايا السلامة و الصحة المهنية في حال كانت إجابتك (نعم)، ما هي المزايا المرجوة من النقابات تجاه العاملين
<input type="checkbox"/> أ- نعم <input type="checkbox"/> ب- لا	43- هل تعرف شخصياً اللجنة القيادية للنقابة

شكراً لحسن تعاونكم

Appendix (1E)

The List of the questionnaires' arbitrators.

A list of the professors, academics, professionals, experts, and arbitrators who reviewed the questionnaires.

Name	Position
<i>Prof. Amer El-Hamouz</i>	Professor of Chemical Engineering at An-Najah National University – Member of the Leading Organization of Professional Chemical Engineers (AIChE) - Associate Member of AMIChemE – Editor in Journal of Safety and Environment Protection Magazine (February 2002 - December 2007) Coordinator of the University Safety Committee (January 2008 - October 2013) – And the Supervisor of Master's Thesis.
<i>Dr. Yahya Saleh Salahat</i>	Assistant Professor in the Department of Industrial Engineering at An-Najah National University and Director of Al Najah Business, Innovation and Partnerships Center (NABIC).
<i>Dr. Hasan Abdel-Fattah</i>	Assistant Professor in the Department of Civil and Environmental Engineering at An-Najah National University and Director of the Institute of Water and Environment.
<i>Eng. Firas Abu Hammad</i>	Director of General Inspection and Labor Protection Department.
<i>Eng. Hiba Awartani</i>	Head of Administrative Quality Department at Palestine Technical University – Khadouri.

Appendix (2): OSH Statistics

Appendix (2)

**The Detailed OSH Statistics and Figures for the Entire and each Industrial Sector
between the years (2009-2016).**

Year	No. of Fixed Employees	No. of O.A	No. of O.I	No. of O.F	No. of O.D	No. of LWHs (Days)	Estimated Financial Losses (USD/\$)
Leather & Shoes Industries							
2009	324	3	3	0	3	170	1,140
2010	306	3	2	0	0	29	990
2011	325	4	4	0	1	69	1,270
2012	290	3	3	0	0	38	840
2013	297	4	4	0	1	35	1,410
2014	300	6	6	0	1	104	1,275
2015	300	4	4	0	1	59	1,510
2016	303	6	5	0	1	51	1,610
TOTAL	2,445	33	31	0	8	555	10,045
Plastic Industries							
2009	571	97	45	0	0	50	300
2010	810	96	37	0	0	83	200
2011	772	159	81	0	0	134	500
2012	831	243	100	0	0	113	1,200
2013	845	218	92	0	0	171	1,700
2014	883	228	101	1	1	273	500
2015	947	191	70	0	0	213	300
2016	990	155	57	0	2	627	1,900
TOTAL	6,649	1,387	583	1	3	1,664	6,600
Paper & Cartoon Industries							
2009	199	15	15	0	0	67	2,000
2010	206	20	20	0	0	67	2,000
2011	216	23	23	0	0	59	1,800
2012	234	22	22	0	0	88	1,800
2013	271	24	24	0	0	65	1,800
2014	278	25	25	0	0	57	1,500
2015	287	28	28	0	1	53	1,600
2016	298	27	29	0	2	65	36,650
TOTAL	1,989	184	186	0	3	521	49,150

Chemical Industries							
2009	178	6	5	0	1	2	0
2010	182	6	6	0	0	7	300
2011	186	5	5	0	0	0	0
2012	192	3	3	0	0	0	0
2013	249	5	5	0	0	90	0
2014	252	8	6	0	0	0	0
2015	250	9	9	0	5	30	550
2016	248	9	7	0	5	65	1,000
TOTAL	1,737	51	46	0	11	194	1,850
Wood & Furniture Industries							
2009	166	21	24	0	0	274	20,000
2010	163	15	10	0	0	48	21,000
2011	176	18	13	0	0	60	6,500
2012	185	11	10	0	0	214	15,000
2013	191	11	5	0	0	33	4,000
2014	194	12	12	0	0	39	1,000
2015	204	28	19	0	0	104	67,000
2016	987	22	16	0	0	135	3,300
TOTAL	2,266	138	109	0	0	907	137,800
Food and beverages Industries							
2009	598	34	22	0	2	196	3,350
2010	672	29	16	0	0	39	1,250
2011	721	29	20	0	0	59	3,220
2012	733	33	22	0	3	290	1,520
2013	823	52	34	0	1	230	3,320
2014	952	63	47	0	6	216	4,950
2015	1,076	68	49	1	8	563	22,300
2016	1,094	68	52	1	6	448	10,280
TOTAL	6,669	376	262	2	26	2,041	50,190
Aluminum & Metallurgical Industries							
2009	674	134	135	0	0	268	4,570
2010	733	99	94	0	0	316	5,620
2011	761	103	103	0	0	295	4,940
2012	767	139	137	0	0	348	6,820
2013	808	85	89	0	0	256	9,130
2014	805	100	97	0	0	414	5,790
2015	853	135	111	0	0	484	18,280
2016	872	146	130	1	1	621	10,870
TOTAL	6,273	941	896	1	1	3,002	66,020

Entire Industrial Sector							
2009	2,710	310	249	0	6	1,027	31,360
2010	3,072	268	185	0	0	589	31,360
2011	3,157	341	249	0	1	676	18,230
2012	3,232	454	297	0	3	1,091	27,180
2013	3,484	399	253	0	2	880	21,360
2014	3,664	442	294	1	8	1,103	15,015
2015	3,917	463	290	1	15	1,506	111,540
2016	4,792	433	296	2	17	2,012	65,610
TOTAL	28,028	3,110	2,113	4	52	8,884	321,655

Where: O.A: Occupational accidents, **O.I:** Occupational Injuries, **O.F:** Occupational Fatalities,

O.D: Occupational Diseases, **LWHs:** Lost Working Hours.

Appendix (3): OSHA Rates

Appendix (3)

The Results of the US-OSHA & EU-OSHA Calculated Ratios for the Palestinian

Industrial Sectors between the years (2009-2016).

	According to US-OSHA Formulas					According to EU-OSHA Formulas				
Year	IR1	IR2	FAR	LTC	SR	IR	FR	AFR	ASR	ODIR
Leather & Shoes Industries										
2009	1.68	47.53	0.0	1.68	28.3	925.93	0.0	4.19	237.63	925.93
2010	0.89	8.58	0.0	0.59	9.67	653.59	0.0	4.44	42.92	0.0
2011	1.39	19.23	0.0	1.39	13.8	1230.77	0.0	5.57	96.15	307.69
2012	0.94	11.87	0.0	0.94	12.67	1034.48	0.0	4.69	59.35	0.0
2013	1.52	10.67	0.0	1.5	7.0	1346.8	0.0	6.09	53.37	336.7
2014	2.11	31.4	0.0	2.1	14.86	2000.0	0.0	9.06	157.0	333.3
2015	1.51	17.8	0.0	1.5	11.80	1333.3	0.0	6.04	89.07	333.3
2016	2.09	15.25	0.0	1.79	7.29	1650.17	0.0	8.97	76.23	330.03
Sum	12.13	162.34	0.0	11.53	105.42	10175.1	0.0	49.05	811.72	2567.0
Av.	1.52	20.29	0.0	1.44	13.18	1271.88	0.0	6.13	101.47	320.88
Plastic Industries										
2009	15.39	7.93	0.0	7.14	0.52	7880.91	0.0	76.94	39.66	0.0
2010	10.74	9.28	0.0	4.14	0.86	4567.9	0.0	53.68	46.41	0.0
2011	18.66	15.07	0.0	9.5	0.84	10492.23	0.0	93.28	78.61	0.0
2012	26.49	12.32	0.0	10.9	0.47	12033.69	0.0	132.44	61.59	0.0
2013	23.37	18.33	0.0	9.86	0.78	10887.57	0.0	116.84	91.65	0.0
2014	23.49	28.0	51.29	10.57	1.19	11551.53	11.3×10^{-4}	116.94	140.02	113.25
2015	18.27	20.37	0.0	6.7	1.12	7391.76	0.0	91.34	101.87	0.0
2016	14.36	57.37	0.0	5.4	3.99	5757.58	0.0	70.91	286.84	202.02
Sum	150.75	168.66	51.29	64.20	9.77	70563.17	11.3×10^{-4}	752.36	846.64	315.27
Av.	18.84	21.08	6.41	8.02	1.22	8820.4	1.4×10^{-4}	94.05	105.83	39.41
Paper & Cartoon Industries										
2009	6.83	30.49	0.0	6.83	4.47	7537.69	0.0	34.14	152.48	0.0
2010	8.79	29.46	0.0	8.79	3.35	9708.74	0.0	43.97	147.30	0.0
2011	9.65	24.74	0.0	9.65	2.57	10648.15	0.0	48.23	123.71	0.0
2012	8.52	34.06	0.0	8.52	4.0	9401.71	0.0	42.58	170.32	0.0

2013	8.02	21.73	0.0	8.02	2.70	8856.09	0.0	40.1	108.63	0.0
2014	8.15	18.57	0.0	8.15	2.28	8992.81	0.0	40.73	92.86	0.0
2015	9.15	16.73	0.0	9.15	1.83	9756.09	0.0	44.19	83.64	348.43
2016	8.81	19.76	0.0	8.81	2.24	9731.54	0.0	41.03	98.79	671.14
Sum	67.92	195.54	0.0	67.92	23.43	74632.81	0.0	334.96	977.72	1019.6
Av.	8.49	24.44	0.0	8.49	2.93	9329.1	0.0	41.87	122.22	127.45
Chemical Industries										
2009	3.56	1.02	0.0	3.05	0.29	2808.99	0.0	15.27	5.09	561.8
2010	2.99	3.48	0.0	2.99	1.17	3296.7	0.0	14.93	17.42	0.0
2011	2.43	0.0	0.0	0.0	0.0	2688.17	0.0	12.17	0.0	0.0
2012	1.42	0.0	0.0	0.0	0.0	1562.5	0.0	7.08	0.00	0.0
2013	1.82	32.74	0.0	1.82	18.0	2008.03	0.0	9.09	163.7	0.0
2014	2.88	0.0	0.0	0.0	0.0	2380.95	0.0	14.38	0.00	0.0
2015	5.07	10.87	0.0	5.07	2.14	3600.0	0.0	16.3	54.35	2000.0
2016	5.11	23.74	0.0	4.38	4.64	2822.58	0.0	16.44	118.7	2016.1
Sum	25.27	71.85	0.0	17.31	26.24	21167.92	0.0	105.65	359.25	4577.9
Av.	3.16	8.98	0.0	2.16	3.28	2645.99	0.0	13.21	44.91	572.24
Wood & Furniture Industries										
2009	11.46	149.5	0.0	11.46	13.04	14457.83	0.0	57.29	747.56	0.0
2010	8.34	26.67	0.0	5.56	3.2	6134.97	0.0	41.68	133.37	0.0
2011	9.26	30.88	0.0	6.69	3.33	7386.36	0.0	46.32	154.4	0.0
2012	5.39	104.78	0.0	4.9	19.45	5405.4	0.0	26.93	523.89	0.0
2013	5.22	15.65	0.0	2.37	3.0	2617.8	0.0	26.08	78.25	0.0
2014	5.6	18.21	0.0	5.6	3.25	6185.57	0.0	28.01	91.05	0.0
2015	12.43	46.18	0.0	8.44	3.71	9313.73	0.0	62.16	230.89	0.0
2016	2.02	12.39	0.0	1.47	6.14	1621.07	0.0	10.1	61.95	0.0
Sum	59.71	404.25	0.0	46.48	55.12	53122.72	0.0	298.57	2021.3	0.0
Av.	7.46	50.53	0.0	5.81	6.89	6640.34	0.0	37.32	252.67	0.0
Food and beverages Industries										
2009	5.45	29.69	0.0	3.64	5.44	3678.93	0.0	25.75	148.44	334.45
2010	3.91	5.25	0.0	2.16	1.35	2380.9	0.0	19.54	26.28	0.0
2011	3.64	7.4	0.0	2.5	2.03	2773.9	0.0	18.2	37.06	0.0
2012	4.45	35.83	0.0	3.01	8.05	3001.36	0.0	20.39	179.18	409.27
2013	5.83	25.31	0.0	3.85	4.34	4131.23	0.0	28.61	126.57	121.5
2014	6.56	20.55	0.0	5.04	3.13	4936.97	0.0	29.97	102.75	630.25
2015	6.39	47.39	42.09	4.88	7.4	4646.84	9.3×10^{-4}	28.62	236.97	743.49
2016	6.12	37.09	41.39	4.89	6.05	4844.6	9.1×10^{-4}	28.15	185.46	548.44
Sum	42.35	208.51	83.48	29.96	37.79	30394.73	18.4×10^{-4}	199.23	1042.7	2787.4
Av.	5.29	26.06	10.44	3.74	4.72	3799.34	2.3×10^{-4}	24.90	130.34	348.43

Aluminum & Metallurgical Industries										
2009	18.0	36.01	0.0	18.0	2.0	20029.67	0.0	90.04	180.08	0.0
2010	12.23	39.05	0.0	11.6	3.19	12824.0	0.0	61.17	195.25	0.0
2011	12.26	35.11	0.0	12.26	2.86	13534.8	0.0	61.3	175.56	0.0
2012	16.41	41.1	0.0	16.18	2.5	17861.8	0.0	82.08	205.49	0.0
2013	9.53	28.7	0.0	9.53	3.01	11014.85	0.0	47.64	143.49	0.0
2014	11.25	46.58	0.0	10.91	4.14	12049.69	0.0	56.26	232.92	0.0
2015	14.34	51.4	0.0	11.79	3.59	13012.89	0.0	71.68	256.98	0.0
2016	15.27	64.5	51.94	13.71	4.22	15022.94	11.5×10^{-4}	75.83	322.53	114.68
Sum	109.28	342.44	51.94	103.98	25.51	115350.6	11.5×10^{-4}	546.0	1712.3	114.68
Av.	13.66	42.81	6.49	13.00	3.19	14418.83	1.4×10^{-4}	68.25	214.04	14.33
Entire Industrial Sector										
2009	10.56	34.32	0.0	8.52	3.25	9188.19	0.0	51.8	171.63	221.4
2010	7.90	17.37	0.0	5.45	2.2	6022.13	0.0	39.5	86.84	0.0
2011	9.81	19.4	0.0	7.17	1.98	7887.23	0.0	48.9	96.98	31.68
2012	12.8	30.58	0.0	8.4	2.39	9189.36	0.0	63.6	152.88	92.82
2013	10.43	22.88	0.0	6.63	2.19	7261.77	0.0	51.87	114.39	57.4
2014	11.12	27.27	12.36	7.49	2.45	8051.31	2.7×10^{-4}	54.63	136.34	218.34
2015	11.05	34.83	11.56	7.08	3.15	7429.15	2.6×10^{-4}	53.53	174.13	382.95
2016	8.5	38.03	18.9	5.95	4.47	6218.7	4.2×10^{-4}	40.92	190.16	354.76
Sum	82.17	224.66	42.82	56.7	22.08	61247.83	9.4×10^{-4}	404.75	1123.3	1359.3
Av.	10.27	28.08	5.35	7.09	2.76	7655.98	1.2×10^{-4}	50.59	140.42	169.92

Where:

IR1: OSHA Incident Rate based on injuries and illnesses, **IR2:** OSHA Incident Rate based on lost workdays, **FAR:** Fatal Accident Rate, **LTC:** Lost Time Case Rate, **SR:** Severity Rate, **IR:** HSE Work Injury Rate, **FR:** Fatality Rate, **AFR:** Accident Frequency Rate, **ASR:** Accident Severity Rate, **ODIR:** Occupational Diseases Incidents Rate, **Av.:** Average Rate.

Appendix (4): SPF & FSI

Appendix (4)

The Results of the Safety Performance Indicators for the Palestinian Industrial Sectors between (2009-2016).

Year	Industrial Sector	
Leather & Shoes Industries		
	FSI	SPF
2009	0.99	453.33
2010	0.44	77.33
2011	0.73	138.0
2012	0.53	101.33
2013	0.57	70.0
2014	1.19	138.67
2015	0.73	118.0
2016	0.83	68.0
Sum	6.01	1164.66
Average	0.75	145.58
Plastic Industries		
	FSI	SPF
2009	1.75	4.12
2010	1.58	6.92
2011	2.71	6.74
2012	2.86	3.72
2013	3.27	6.28
2014	4.05	9.58
2015	3.05	8.92
2016	4.51	32.36
Sum	23.77	78.64
Average	2.97	9.83
Paper & Cartoon Industries		
	FSI	SPF
2009	2.28	35.73
2010	2.55	26.8
2011	2.44	20.52
2012	2.69	32.0
2013	2.09	21.67
2014	1.95	18.24
2015	1.92	15.14
2016	2.01	19.26
Sum	17.93	189.36

Average	2.24	23.67
Chemical Industries		
	FSI	SPF
2009	0.28	2.67
2010	0.51	9.33
2011	0.0	0.0
2012	0.0	0.0
2013	1.22	144.0
2014	0.0	0.0
2015	0.94	26.67
2016	1.4	57.78
Sum	4.35	240.45
Average	0.54	30.06
Wood & Furniture Industries		
	FSI	SPF
2009	6.54	104.38
2010	2.36	25.6
2011	2.67	26.67
2012	3.76	155.64
2013	1.43	24.0
2014	1.6	26.0
2015	3.79	29.71
2016	0.79	49.1
Sum	22.93	441.1
Average	2.87	55.14
Food and beverages Industries		
	FSI	SPF
2009	1.96	46.12
2010	0.72	10.76
2011	0.82	16.28
2012	1.91	70.3
2013	1.9	35.39
2014	1.76	27.43
2015	2.6	66.24
2016	2.29	52.7
Sum	13.95	325.22
Average	1.74	40.65
Aluminum & Metallurgical Industries		
	FSI	SPF
2009	4.03	16.0
2010	3.46	25.54
2011	3.28	22.9
2012	4.11	20.02

2013	2.61	24.1
2014	3.62	33.12
2015	4.29	28.68
2016	4.95	34.03
Sum	30.34	204.39
Average	3.79	25.55
Entire Industrial Sector		
	FSI	SPF
2009	2.98	26.5
2010	1.85	17.58
2011	2.18	15.86
2012	3.12	19.22
2013	2.44	17.64
2014	2.73	19.96
2015	3.05	26.02
2016	2.79	37.17
Sum	21.14	179.95
Average	2.64	22.49

Appendix (5): Safety Pillars

Appendix (5)

The OSH Pillars Connected to their Policies, Procedures, and Responsibilities.

OSH Pillars					
Policies, Procedures, and Responsibilities	System	Attitude	Fundamentals	Experience	Time
	OSH Awareness <i>Responsibility: Officials PICs PGFTU</i>	Establishments' Culture <i>Responsibility: Officials PICs PGFTU</i>	Perception of Concepts - OSH Concept - Risk / Accident / injury / disease Concepts - OSH Benefits - OSH Losses - OSH Requirements & Tools <i>Responsibility: Officials Ministries PICs PGFTU</i>	Establishments' History - Age - Industry - Economic Strengths - Location - Goals - Certificates - Employees <i>Responsibility: Officials PGFTU Employers</i>	Recognition of Problem - Risk Sources - Occupational Accidents - Occupational Diseases - Ignorance <i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>
	OSH Strategies - Planning - Executing - Evaluating <i>Responsibility: Officials Ministries PICs Employers</i>	Recognition of Problem - Risk Sources - Occupational Accidents - Occupational Diseases - Ignorance <i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>	Responsibility & Commitment - Management - Leadership - Involvement <i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>	Competitive Advantage <i>Responsibility: Officials Ministries PICs Employers</i>	Patience - Raising Awareness - Providing OSH Requirements & Tools - Responsibility & Commitment - Going on Despite Failure - Insisting on Success <i>Responsibility: Officials Ministries PGFTU Employers</i>
	Requirements - OSH Requirements - Working Environment - OSH Tools - Support & Motivation <i>Responsibility: Officials Ministries PICs</i>	Perception of Problem - Misrepresentation of facts - Misjudgment of the case <i>Responsibility: Officials Ministries</i>		Sharing - Knowledge - Experts & Expertise - Previous Cases - Experience - Advice - Consultation <i>Responsibility: Officials Ministries PICs</i>	Sharing - Knowledge - Experts & Expertise - Previous Cases - Experience - Advice - Consultation <i>Responsibility: Officials Ministries PICs</i>

<i>PGFTU Employers</i>	<i>PICs PGFTU Employers Employees</i>		<i>PGFTU Employers</i>	<i>PGFTU Employers</i>
Individuals Development	Individuals Development	Individuals Development	Individuals Development	Individuals Development
<i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>	<i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>	<i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>	<i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>	<i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>
Trust, reliability & Stability	Trust, reliability & Stability - Fear - Moral & Financial Rights - Job Satisfaction			
<i>Responsibility: Officials PGFTU Employers Employees</i>	<i>Responsibility: Officials PGFTU Employers Employees</i>			
Documentations - Historical Data - Updated Data Base - Records - Forms & Templates		OSH Program Development - Documented Procedures - Administration - Inspection - Maintenance - Investigation - Evaluation	Documentations - Historical Data - Updated Data Base - Records - Forms & Templates	Documentations - Historical Data - Updated Data Base - Records - Forms & Templates
<i>Responsibility: Officials Ministries PICs PGFTU Employers</i>		<i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>	<i>Responsibility: Officials Ministries PICs PGFTU Employers</i>	<i>Responsibility: Officials Ministries PICs PGFTU Employers</i>
Feedback & Cooperation	Feedback & Cooperation	Feedback & Cooperation	Feedback & Cooperation	Feedback & Cooperation
<i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>	<i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>	<i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>	<i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>	<i>Responsibility: Officials Ministries PICs PGFTU Employers Employees</i>
Research	Research	Research	Research	Research

<i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>	<i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>	<i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>	<i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>	<i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>
YOU (Officials, Establishments, PICs, Employees, CD)				
Enforcement of Law - Rights - Duties - Sanctions - Violations <i>Responsibility:</i> <i>Officials</i>	Officials - Government - MOL - MOH - MNE - MOE - MOHE - CD <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>	Recognition of Problem - Risk Sources - Occupational Accidents - Occupational Diseases - Ignorance <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>	Perception of Concepts - OSH Concept - Risk / Accident / injury / disease Concepts - OSH Benefits - OSH Losses - OSH Requirements & Tools <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i>	
OSH Awareness <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i>	Individuals Development <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>	Responsibility & Commitment - Management - Leadership - Involvement <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i>	Trust, reliability & Stability - Fear - Moral & Financial Rights - Job Satisfaction <i>Responsibility:</i> <i>Officials</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>	
Requirements - OSH Requirements - Working Environment - OSH Tools - Support & Motivation <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i>	OSH Program Development - Documented Procedures - Administration - Inspection - Maintenance - Investigation - Evaluation <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i>	Sharing - Knowledge - Experts & Expertise - Previous Cases - Experience - Advice - Consultation <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i>	Documentations - Historical Data - Updated Data Base - Records - Forms & Templates <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i>	

	PGFTU Employers Employees		
Feedback & Cooperation <i>Responsibility:</i> Officials Ministries PICs PGFTU Employers Employees		Research <i>Responsibility:</i> Officials Ministries PICs PGFTU Employers Employees	
Sustainability Pillars			
Economy		Society	Environment
OSH Economic - Evaluating OSH Economic Losses - Productivity - Work Capacity - Protecting Machinery - Developing Experts & Skilled Employees - Industry Reputation - Competitiveness - Unstable Workplace - Employees'Low Performance <i>Responsibility:</i> Officials Ministries PICs PGFTU Employers Employees		Developing Society Culture - Officials (MOL-MOHE) <i>Responsibility:</i> Officials Ministries	Developing Workplace Awareness - Internal Working Environment - External Working Environment - Working Conditions - Machinery Maintenance - Work Practices <i>Responsibility:</i> Officials Ministries Employers
Preventive Methodologies & Tools - Innovative Technologies - Developing Investigation Forms - Motivational Incentives <i>Responsibility:</i> Officials Ministries PICs PGFTU Employers		Education & Trainings Curriculum - OSH in Schools (Primary-Secondary) - OSH in universities - OSH in Training Campaigns <i>Responsibility:</i> Officials Ministries	Requirements - OSH Requirements - Working Environment - OSH Tools - Support & Motivation <i>Responsibility:</i> Officials Ministries PICs PGFTU Employers
Individuals Development <i>Responsibility:</i> Officials Ministries PICs PGFTU Employers Employees		Individuals Development <i>Responsibility:</i> Officials Ministries PICs PGFTU Employers Employees	Individuals Development <i>Responsibility:</i> Officials Ministries PICs PGFTU Employers Employees

	Methodologies Development <ul style="list-style-type: none"> - Awareness Methodologies - Awareness Tools - Awareness Materials <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i>	Officials <ul style="list-style-type: none"> - Promoting the Role of: * Ministry of Environment (MOE) * Municipality <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i>
Documentations <ul style="list-style-type: none"> - Historical Data - Updated Data Base - Records - Forms & Templates <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i>	Documentations <ul style="list-style-type: none"> - Historical Data - Updated Data Base - Records - Forms & Templates <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i>	
Sharing <ul style="list-style-type: none"> - Knowledge - Experts & Expertise - Previous Cases - Experience - Advice - Consultation <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i>	Sharing <ul style="list-style-type: none"> - Knowledge - Experts & Expertise - Previous Cases - Experience - Advice - Consultation <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i>	Sharing <ul style="list-style-type: none"> - Knowledge - Experts & Expertise - Previous Cases - Experience - Advice - Consultation <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i>
Feedback & Cooperation <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>	Feedback & Cooperation <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>	Feedback & Cooperation <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>
Research <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>	Research <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>	Research <i>Responsibility:</i> <i>Officials</i> <i>Ministries</i> <i>PICs</i> <i>PGFTU</i> <i>Employers</i> <i>Employees</i>

جامعة النجاح الوطنية
كلية الدراسات العليا

تطوير إطار مفاهيمي للسلامة والصحة المهنية في الصناعات التصنيعية الفلسطينية

إعداد

حنان سليم طحل

إشراف

أ.د. عامر الهموز

قدمت هذه الأطروحة استكمالاً لمتطلبات الحصول على درجة الماجستير في الإدارة الهندسية بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس، فلسطين.

2018

تطوير إطار مفاهيمي للسلامة والصحة المهنية في الصناعات التصنيعية الفلسطينية

إعداد

حنان سليم طحل

إشراف

أ.د. عامر الهموز

الملخص

تؤكد الزيادة السنوية في عدد الحوادث والأمراض المهنية في الصناعات التحويلية الفلسطينية وجود مشكلة خطيرة تهدد سلامة وصحة العاملين في مكان العمل. لذا، تهدف هذه الدراسة إلى تحليل واقع السلامة والصحة المهنية (OSH) في القطاعات الصناعية الفلسطينية من أجل تطوير إطار للسلامة والصحة المهنية قادر على تطبيق قانون السلامة والصحة المهنية بفعالية للحد من الحوادث والأمراض المهنية في المستقبل. كما وتهدف هذه الدراسة أيضاً إلى إيجاد معدلات السلامة والصحة المهنية المختلفة باستخدام معادلات US-OSHA و EU-OSHA واستناداً على إحصائيات حقيقية.

لتحقيق هذه الأهداف وغيرها تبنت هذه الأطروحة طريقة المنهجية المختلطة. حيث تم إجراء سبع مقابلات شبه منظمة وتصميم اثنين من الاستبيانات المنظمة. هذا وكشفت نتائج الدراسة أن حوالي 61.0% من عمال الصناعة هم عرضة لمخاطر العمل، و 32.0 % سبق وتعرضوا لحوادث المهنية، بينما 9.0% يعانون من الأمراض المهنية. هذا وبلغ متوسط معدل الإصابات (7,566) إصابة لكل 100,000 عامل ما يدل على ضعف مستوى الصحة والسلامة المهنية في الصناعات التحويلية الفلسطينية. من جهة أخرى، أكدت نتائج حسابات عامل سلامة الأداء (SPF) أن قطاع الصناعات الجلدية هو القطاع الأشد خطورةً بمتوسط يصل إلى 145.6 يوماً ضائعاً لكل حادث، في حين يشدد مؤشر شدة التردد (FSI) على خطورة قطاع الصناعات المعدنية فيما يتعلق بشدة وتكرار هذه الحوادث ويمتوسط يصل إلى 3.8.

بناءً على ذلك، تعرض هذه الأطروحة تطوير إطار مفاهيمي مثالي للسلامة والصحة المهنية قائم على دعائم السلامة والتنمية المستدامة من أجل: ضمان الإنفاذ الفعال لقانون السلامة والصحة المهنية، ومنع الحوادث والأمراض المهنية مستقبلاً.

وأخيراً، تعد هذه الأطروحة إضافة كبيرة لمسؤولي السلامة والصحة المهنية، المراجعات الأدبية، والباحثين. وفي نفس الوقت، توفر هذه الأطروحة معلومات هامة، ونتائج مهمة لدعم وتعزيز الأبحاث المستقبلية الضرورية في مجال السلامة والصحة المهنية.