



UNIVERSITI PUTRA MALAYSIA

***DEVELOPMENT OF SEMI-QUANTITATIVE MODEL
FOR OCCUPATIONAL STRESS RISK ASSESSMENT MATRIX
AT PORT TERMINAL IN PENANG, MALAYSIA***

NORWAHIDA BINTI YAKUB @ YAKUB

FPSK(p) 2022 21



**DEVELOPMENT OF SEMI-QUANTITATIVE MODEL
FOR OCCUPATIONAL STRESS RISK ASSESSMENT MATRIX
AT PORT TERMINAL IN PENANG, MALAYSIA**

By

NORWAHIDA BINTI YAKUB @ YAKUB

**Thesis Submitted to the School of Graduate Studies,
Universiti Putra Malaysia, in Fulfilment of the
Requirements of the Degree Doctor of Philosophy**

June 2021

All material contained within the thesis, including without limitation text, logos, icons, photographs and all other artwork, is copyright material of Universiti Putra Malaysia unless otherwise stated. Use may be made of any material contained within the thesis for non-commercial purposes from the copyright holder. Commercial use of material may only be made with the express, prior, written permission of Universiti Putra Malaysia.

Copyright © Universiti Putra Malaysia



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in
fulfilment of the requirement for the degree Doctor of Philosophy

**DEVELOPMENT OF SEMI-QUANTITATIVE MODEL FOR
OCCUPATIONAL STRESS RISK ASSESSMENT MATRIX AT PORT
TERMINAL IN PENANG, MALAYSIA AT PORT TERMINAL IN PENANG**

By

NORWAHIDA BINTI YAKUB @ YAAKUB

June 2021

**Chair : Associate Professor Mohd Rafee Bin Baharudin, PhD
Faculty: Medicine and Health Sciences**

The port sector is a subsystem of the supply chain and is considered vital in Malaysia. Occupational stress is increasing among port employees due to a high-risk working environment. Risk assessment is the first step in identifying any potential risk or flaw related to OHS issues and supporting decision-making in OHS implementation to decrease ill health issues. While legislation establishes rules for risk assessment, employers often lack adequate guidance and are exposed to psychosocial issues such as occupational stress. The main objective of this study is to develop a risk matrix model that is primarily focused on occupational stress. The model will be designated the Occupational Stress Risk Assessment Matrix (OSRAM), and it will have three dimensions: Likelihood (L), Severity (S), and Control Modification Factor (CMF). This approach was used to identify hazards and determine the initial and residual risk associated with risk factors that contributed to occupational stress. A cross sectional survey was conducted in Penang port terminal, resulting in the selection of 310 respondents from a total population of 380 using a simple random sample approach that met inclusion and exclusion criteria. The processes consisted of two stages. Specifically, the first phase comprised the collecting of baseline data, and the second phase involved the development of a risk assessment matrix applying a semi-quantitative methodology approach. Additionally, SPSS version 25.0 and SPSS AMOS were performed to examine all data from the Socio-Demographic Survey, Job Content Questionnaire (JCQ), and Occupational Health Safety Monitoring Questionnaire (OHSMQ). The OSRAM technique was used to determine the probability of a hazard, the severity of the hazard, and the CMF of the assessed activities linked with this risk factor. The statistical analysis included descriptive analysis, chi-square, structural equation modelling (SEM), and paired sample t-test analysis. The response rate was 98 percent as a result. The sociodemographic distribution was studied, and age was shown to be significantly associated with occupational stress ($p = 0.03$). Job strain was found to be prevalent in 68.8 percent of cases. The majority of occupational stress risk factors are strongly associated with occupational stress, and SEM analysis proves that a modest risk contributed to occupational stress. OSRAM was constructed as a 5x5 matrix containing

STRESSOR dimensions, severity level, and CMF. The five risk categories are very low (VL), low (L), moderate (M), high (H), and extremely high (EH), with a score ranging from one to twenty-five. OSRAM was applied in a container port, and the majority of hazards analysed indicated a reduction in the risk level associated with the eight selected activities. A comparison has been made between OSRAM and present RAM, as well as the stress scale. As a result, a significant link between OSRAM and the current matrix was discovered, with a p value less than 0.05. According to the stress scale, all work activities were deemed significant. The OSRAM responds more accurately than existing RAM as a risk estimator. In conclusion, OSRAM has established itself as a critical OHS risk assessment instrument, particularly in the Malaysian port industry.

Keywords: risk assessment matrix, modifying risk factor, occupational stress, port industry



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
Sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**MEMBANGUNKAN MODEL MATRIKS SEPARA KUANTITATIF
PENAKSIRAN RISIKO TEKANAN PEKERJAAN (MPRTP) DI TERMINAL
PELABUHAN PULAU PINANG, MALAYSIA**

Oleh

NORWAHIDA BINTI YAKUB @ YAAKUB

Jun 2021

Pengerusi : Profesor Madya Mohd Rafee Bin Baharudin, PhD
Fakulti : Perubatan dan Sains Kesihatan

Sektor pelabuhan adalah subsistem rantaian bekalan dan dianggap penting di Malaysia. Tekanan pekerjaan semakin meningkat di kalangan pekerja pelabuhan kerana persekitaran kerja yang berisiko tinggi. Penilaian risiko ialah langkah pertama dalam mengenal pasti sebarang potensi risiko atau kecacatan yang berkaitan dengan isu OHS dan menyokong pembuatan keputusan dalam pelaksanaan OHS untuk mengurangkan masalah kesihatan. Walaupun undang-undang menetapkan peraturan untuk penilaian risiko, majikan sering kekurangan panduan yang mencukupi dan terdedah kepada isu psikososial seperti tekanan pekerjaan. Objektif utama kajian ini adalah untuk membangunkan model matriks risiko yang tertumpu terutamanya kepada tekanan pekerjaan. Model ini dinamakan Matriks Penilaian Risiko Tekanan Pekerjaan (MPRPP) yang mana terdapat tiga magnitud iaitu Kebarangkalian (L), Keterukan (S) dan Faktor Modifikasi Kawalan (CMF). Pendekatan ini digunakan untuk mengenal pasti bahaya dan menentukan risiko awal dan baki yang dikaitkan dengan faktor risiko yang menyumbang kepada tekanan pekerjaan. Tinjauan keratan rentas telah dijalankan di terminal pelabuhan Pulau Pinang, menghasilkan pemilihan 310 responden daripada jumlah populasi 380 menggunakan pendekatan sampel rawak mudah yang memenuhi kriteria kemasukan dan pengecualian. Proses tersebut terdiri daripada dua peringkat. Secara khususnya, fasa pertama terdiri daripada pengumpulan data asas, dan fasa kedua melibatkan pembangunan matriks penilaian risiko yang menggunakan pendekatan metodologi separa kuantitatif. Selain itu, SPSS versi 25.0 dan SPSS AMOS telah dilakukan untuk memeriksa semua data daripada Tinjauan Sosio-Demografi, Soal Selidik Kandungan Pekerjaan (JCQ), dan Soal Selidik Pemantauan Keselamatan Kesihatan Pekerjaan (OHSMQ). Teknik OSRAM digunakan untuk menentukan kebarangkalian bahaya, keterukan bahaya, dan CMF aktiviti yang dinilai yang dikaitkan dengan faktor risiko ini. Analisis statistik termasuk analisis deskriptif, khi kuasa dua, pemodelan persamaan struktur (SEM), dan analisis ujian-t sampel berpasangan. Kadar tindak balas adalah 98 peratus sebagai hasilnya. Taburan sosiodemografi telah dikaji, dan umur ditunjukkan secara signifikan dikaitkan dengan tekanan pekerjaan ($p = 0.03$). Ketegangan kerja didapati berleluasa dalam 68.8 peratus kes. Majoriti faktor risiko tekanan pekerjaan

sangat dikaitkan dengan tekanan pekerjaan, dan analisis SEM membuktikan bahawa risiko yang sederhana menyumbang kepada tekanan pekerjaan. MPRPP dibangunkan sebagai matriks 5x5 yang mengandungi dimensi STRESSOR, tahap keterukan dan CMF. Lima kategori risiko adalah sangat rendah (VL), rendah (L), sederhana (M), tinggi (H), dan sangat tinggi (EH), dengan skor antara satu hingga dua puluh lima. OSRAM telah digunakan dalam pelabuhan kontena, dan majoriti bahaya yang dianalisis menunjukkan pengurangan dalam tahap risiko yang berkaitan dengan lapan aktiviti terpilih. Perbandingan telah dibuat antara OSRAM dan RAM sekarang, serta skala tekanan. Akibatnya, pautan yang ketara antara OSRAM dan matriks semasa ditemui, dengan nilai p kurang daripada 0.05. Mengikut skala tekanan, semua aktiviti kerja dianggap penting. OSRAM bertindak balas dengan lebih tepat daripada RAM sedia ada sebagai penganggar risiko. Kesimpulannya, OSRAM telah memantapkan dirinya sebagai instrumen penilaian risiko OHS yang kritikal, khususnya dalam industri pelabuhan Malaysia.

Kata kunci: penilaian risiko, matrik, tekanan pekerjaan, terminal pelabuhan

ACKNOWLEDGEMENTS

**In the name of Allah S.W.T., Most Gracious, Most Merciful,
With the Selawat and Salam to Prophet Muhammad SAW.,**

Alhamdulillah, I express my first and foremost gratitude to Allah S.W.T., who bless me with wisdom, commitment and the strength for He who is Ever All-Powerful, All-Wise. This study was conducted in a container terminal located in Butterworth, Penang and was successfully completed in February 2019. I would like to express a million thanks to my lovely parents (**Haji Yaakub & Hjh Fatimah**), siblings and lovely nephew who always provide me with love, and support. A token of appreciation also goes to my husband (**Faiz Jalani**), In-Law (**Haji Jalani & Hjh Siti Jemaah**) and family in law for their continuous encouragement, and support throughout my research journey.

My greatest gratitude goes next to my supervisor, **Asc. Prof Dr. Mohd Rafee Bahrudin, and Committee (Dr. Huda, Dr. Saliza & Dr. Mohammad Azhar)** who had taught and educated me sincerely. Their help and support have enable my research project to run smoothly and successfully. Many others who are not mentioned here but have provided and helped me throughout my project will always be remembered by me.

My heartiest thanks to **Prof. Rusli B. Nordin** who gave me permission to use the Job Content Questionnaires (JCQ) in my project. I deeply appreciation your guidance and support in teaching me how to use this questionnaire.

A special appreciation to North Butterworth Container Terminal (NBCT) management, **Mr. Mazlan Bin Abdul Mutaliff** (OSHE Manager) and to all staff of NBCT especially the port staffs themselves, thank you for your support in making this research project a success.

Last but not least, my colleagues, and friends who have directly and indirectly given me assistance, support, and encouragement throughout this study. All of your contributions cannot be paid by any single dime. I pray Allah S.W.T blesses all of you. Insha-Allah.

Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

Signature : _____

Name of Chairman of
Supervisory Committee: Asc. Prof. Dr. Mohd Rafee Baharudin

Signature : _____

Name of Member of
Supervisory Committee: Dr. Saliza Elias

Signature : _____

Name of Member of
Supervisory Committee: Dr. Huda Zainuddin

Signature : _____

Name of Member of
Supervisory Committee: Dr. Mohd Azhar Mohd Noor

This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

Mohd Rafee bin Baharudin, PhD

Associate Professor
Faculty of Medicine and Health Science
Universiti Putra Malaysia
(Chairman)

Saliza binti Mohd Elias, PhD

Senior Lecturer
Faculty of Medicine and Health Science
Universiti Putra Malaysia
(Member)

Huda binti Zainuddin, PhD

Senior Medical Lecturer
Faculty of Medicine and Health Science
Universiti Putra Malaysia
(Member)

Mohamad Azhar bin Mohd Noor, PhD

Senior Lecturer
Faculty of Environmental Health
Univesiti Teknologi MARA
(Member)

ZALILAH MOHD SHARIFF, PhD

Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date: 20 January 2022

TABLE OF CONTENTS

	Page
ABSTRACT	i
ABSTRAK	iii
ACKNOWLEDGEMENTS	v
APPROVAL	vi
DECLARATION	viii
LIST OF TABLES	xiii
LIST OF FIGURES	xvii
LIST OF ABBREVIATIONS	xix
LIST OF APPENDICES	xxi
CHAPTER	
1. INTRODUCTION	
1.1 Research Background	1
1.2 Problem Statement	3
1.3 Study Justification	6
1.4 Research Question	8
1.5 Research Objective	8
1.5.1 General Objective	8
1.5.2 Specific Objectives	8
1.6 Hypothesis	9
1.7 Conceptual and Operational Definition	9
1.8 Conceptual Framework	10
2. LITERATURE REVIEW	
2.1 Port Industry	12
2.1.1 A Brief Introduction	12
2.1.2 Malaysia Context	17
2.2 Occupational Stress	17
2.2.1 Overview of Occupational Stress	17
2.2.2 Prevalence of Occupational Stress	20
2.2.3 Psychosocial Risk Factors	22
2.2.4 Effect of Occupational Stress	25
2.2.5 Occupational Stress Assessment	27
2.3 Job Content Questionnaire and Depression, Anxiety and Stress Scales	31
2.4 Hazard and Risk: A Brief Introduction	33
2.4.1 Risk Assessment	34
2.4.2 Risk Matrix	36
2.4.3 Risk Acceptance Criteria	37
2.4.4 Type of Risk Assessment Matrix	38
2.4.5 Qualitative Assessment Matrix	46
2.4.6 Qualitative - Quantitative Assessment Matrix	47
2.4.7 Control Modification Factor of Occupational Stress	48
2.4.8 Risk Response and Mitigation Measure	51
2.4.9 Benefit Risk Assessment	52
2.4.10 Current Risk Assessment Practice in Malaysia	53

2.4.11	Risk Assessment in Occupational Stress Study	53
2.4.12	Summary of Literature Review	55
3.	METHODOLOGY	
3.1	Study Location	56
3.2	Study Design	58
3.3	Sampling Method	58
3.3.1	Sampling Strategy	59
3.3.2	Study Population	59
3.3.3	Sampling Frame	59
3.3.4	Sampling Unit	60
3.3.5	Sample Size	61
3.4	Instruments and Tools	62
3.4.1	Walk-through survey	62
3.4.2	Socio-Demographic Questionnaire	62
3.4.3	Job Content Questionnaire (JCQ)	62
3.4.4	Depression, Anxiety and Stress Scale (DASS) Questionnaire	64
3.4.5	Occupational Health Safety Monitoring Questionnaire (OHSMQ)	65
3.5	Quality Control	66
3.5.1	Questionnaires	66
3.5.2	Expert and Practitioner Review	67
3.5.3	Pre-Test of Study	68
3.5.4	Pilot Study	68
3.6	Validity and Reliability of Instruments	68
3.6.1	Factor Analysis and Reliability	68
3.6.2	Job Content Questionnaire (JCQ)	69
3.6.3	Depression, Anxiety, Stress Scale (DASS)	69
3.6.4	Occupational Health Safety Monitoring Questionnaire (OHSMQ)	70
3.7	Data Collection	71
3.7.1	Study Flow Process - Phase 1	71
3.7.2	Study Flow Process - Phase 2	74
3.8	Study Variables	79
3.8.1	Dependent Variables	79
3.8.2	Independent Variables	79
3.9	Data Analysis	80
3.9.1	Univariate Analysis	80
3.9.2	Bivariate analysis	81
3.9.3	Multivariate analysis	81
3.10	Ethics of Study	83
4.	STUDY RESULTS	
4.1	Response Rate	84
4.2	Socio-Demographic Characteristics of Respondents	84
4.3	Prevalence of Workplace Stress among Respondents	86
4.4	The relationship Between Occupational Stress with Socio- Demography	88
4.5	The relationship Between Occupational Stress with Risk Factors of Occupational Stress among Respondents	91

4.6	Risk Factors of Occupational Stress among Respondents	94
4.7	Development of Occupational Stress Risk Assessment Matrix	101
4.8	Implementation of Occupational Stress Risk Assessment Matrix	112
4.9	Occupational Stress Implementation at Selected Activities	123
5.	DISCUSSION	
5.1	Prevalence of Occupational Stress	130
5.2	Relationship between Occupational Stress with Socio demography	131
5.3	Relationship between Risk Factor and Occupational Stress	133
5.4	Risk Factor of Workplace Stress Using SEM Analysis	134
5.5	Development Occupational Stress Risk Assessment Matrix (OSRAM)	136
5.5.1	Likelihood and Severity Scoring	137
5.5.2	Framework of Risk Matrix	138
5.5.3	Control modification factor	140
5.6	Implementation of Occupational Stress Risk Assessment Matrix	142
5.7	Occupational Stress Implementation at Selected Activities	147
6.	SUMMARY, CONCLUSION AND RECOMMENDATION	
6.1	Summary of the study	150
6.2	Significant Findings / Contributions	153
6.3	Conclusion	154
6.4	Study Limitation	155
6.5	Recommendation	155
	REFERENCES	156
	BIODATA OF STUDENT	227
	LIST OF PUBLICATIONS	228

LIST OF TABLES

Table		Page
1.1	Conceptual and Operational Definitions	9
2.1	Possible factors cause occupational stress	24
2.2	Symptom from effect of occupational stress	26
2.3	Sample of occupational stress model	29
2.4	Typical set of occupational stress questionnaires	30
2.5	Risk assessment matrix according to MIL-STD 882E	38
2.6	IL-STD-882E Probability Levels	39
2.7	MIL-STD-882E Severity Categories	39
2.8	Example of 3x3 matrix with 3 levels of risk standard	40
2.9	Likelihood of an event occurrence	40
2.10	Severity of hazard	40
2.11	Example of 4x4 risk assessment matrix by NCPS	41
2.12	Likelihood of an event occurrence	41
2.13	Severity of hazard	41
2.14	Example of 5x3 matrix	42
2.15	Example of 8x4 risk matrix	42
2.16	Risk Assessment Matrix (RAM) by DOSH	43
2.17	Priority based on the stated ranges	44
2.18	Likelihood of an event occurrence	44
2.19	Severity of hazard	44
2.20	Risk Assessment Matrix (RAM) by Penang Port	45
2.21	Likelihood of an event occurrence	45
2.22	Severity of hazard	45
2.23	Comparison of Types of General RAM and CMF Application	46

2.24	Typical qualitative matrix	47
2.25	Typical semi-qualitative matrix	47
2.26	Risk assessment on occupational stress in a small business	55
2.27	Risk management approach to occupational stress	55
3.1	Job Content Questionnaire (JCQ) Formula	63
3.2	DASS-21 severity rating	65
3.3	Elements of each item in the developed instrument	66
3.4	Bartlett's Test and KMO Value	69
3.5	Construction of risk assessment matrix	76
3.6	Categories of model fit and level of acceptance	81
4.1	Socio-demographic characteristics among respondents	84
4.2	Distribution of organisational factors among respondents	88
4.3	Percentage of high strain and non-high strain	88
4.4	Age of respondents and occupational stress	89
4.5	Ethnicity of respondents and occupational stress	89
4.6	Education Background of respondents and occupational stress	90
4.7	Marital Status of respondents and occupational stress	90
4.8	Duration of Employment of respondents and occupational stress	90
4.9	Monthly Income of respondents and occupational stress	91
4.10	Social support and occupational stress	91
4.11	Task and occupational stress	92
4.12	Recognition and occupational stress	92
4.13	Exposure and occupational stress	92
4.14	Skilled work and occupational stress	93
4.15	Stability and occupational stress	93
4.16	Organizational culture and occupational stress	93

4.17	Response from customer and occupational stress	94
4.18	Assessment for Construct Validity	95
4.19	Regression result analysis	99
4.20	Regression relation between variables	100
4.21	Mean value of risk factor occupational stress	102
4.22	Likelihood for occupational stress risk matrix	103
4.23	Likelihood Table	104
4.24	Likelihood for each risk factor	104
4.25	Severity table for occupational stress	106
4.26	Occupational Stress Risk Assessment Matrix (OSRAM)	107
4.27	Risk rating criteria for occupational stress table	108
4.28	The content validation result summary using content validation index method	109
4.29	Control modification factor value	111
4.30	Eight type of works been chosen in this study	113
4.31	Comparison result for container direct delivery operation	124
4.32	Comparison result for discharge loading or unloading container	124
4.33	Comparison result for barge operation	124
4.34	Comparison result for railed mounted gantry operation	125
4.35	Comparison result for rubber tyred gantry operation	125
4.36	Comparison result for wagon operation	125
4.37	Comparison result for empty container operation	125
4.38	Comparison result for stevedoring operation	126
4.39	Comparison result for container direct delivery operation	127
4.40	Comparison result for discharge loading or unloading container	127
4.41	Comparison result for barge operation	127

4.42	Comparison result for railed mounted gantry operation	128
4.43	Comparison result for rubber tyred gantry operation	128
4.44	Comparison result for wagon operation	128
4.45	Comparison result for empty container operation	128
4.46	Comparison result for stevedoring operation	129



LIST OF FIGURES

Figure		Page
1.1	Framework risk assessment on occupational stress	11
2.1	Intercontinental and Intra-Asian Route Trade	13
2.2	Location of major Malaysia's container ports	13
2.3	Location NBCT in Penang Port Sdn Bhd	14
2.4	Typical View of Port Terminal	15
2.5	Trend in cargo throughput by Malaysian Ports	16
2.6	Handling of export and Import Container by Ports, Malaysia	16
2.7	General Practice in Hierarchy of Control	49
3.1	Location of study sampling at the port terminal Penang	56
3.2	Aerial view of NBCT from Penang mainland	57
3.3	Aerial view of NBCT from Penang Island	57
3.4	Overall sampling method process	58
3.3	Sampling technique process	60
3.4	Data collection flowchart	72
3.5	Study flow diagram	73
4.1	Score of decision latitude among respondents	86
4.2	Score of psychological job demands among respondents	87
4.3	The Standardized Path Coefficient for the structural model	96
4.4	The Path Regression Coefficient for the structural model	97
4.5	Regression analysis between variables	98
4.6	Percentage of hazard based on type of activity	113
4.7	Container direct delivery operation bar chart	115
4.8	Discharge loading or unloading container from vessel bar chart	116

4.9	Barge operation bar chart	117
4.10	Railed Mounted Gantry Operation (RMG) bar chart	118
4.11	Rubber Tyred Gantry Operation (RTG) bar chart	119
4.12	Wagon operation bar chart	120
4.13	Empty container operation bar chart	121
4.14	Stevedoring operation bar chart	122
4.15	The OSRAM level among 40 respondents	129
4.16	The DASS level among 40 respondents	129
5.1	Framework of OSRAM assessment	144

LIST OF ABBREVIATIONS

=	Is equal to
%	Percentage
χ^2	Chi – square
(,)	Parentheses
AGFI	Adjusted goodness of fit index
AMOS	Analysis of a Moment Structures
CFI	Comparative fit index
CVI	Content validity index
DASS	Depression, anxiety, stress scale
DF	Degree of freedom
Etc.	Etcetera
et. al	And colleague
GFI	Goodness of fit index
HIRARC	Hazard Identification, Risk Assessment and Risk Control
HSE	Health and Safety Executive
JCQ	Job content questionnaire
IR	Initial risk
RR	Residual risk
NIOSH	National Institute for Occupational Safety and Health
NFI	Normed fit index
OSHA	Occupational Safety and Health Act
OHS	Occupational health safety
OHSMQ	Occupational health safety monitoring questionnaire
OSRAM	Occupational stress risk assessment matrix

RMSEA	Root Mean Square Error of Approximation
RAM	Risk assessment matrix
RMG	Railed mounted gantry
RTG	Rubber tyred gantry
SEM	Structural equation modelling
TLI	Tucker lewis index
TEU'S	Twenty-foot equivalent units
WHO	World health organization



© COPYRIGHT UPM

LIST OF APPENDICES

Appendix		Page
1	Research Permission Letter from UPM	184
2	Organizational Approval Letter	188
3	Ethical approval from Medical Research Ethics Committee	191
4	Respondent Information Sheet, Respondent Consent Letter, Questionnaires (JCQ, DASS & OHSMQ)	195
5	Photograph	214
6	Sample of OSRAM sheet	219
7	Description risk factor OSRAM	221
8	List of Training	225

CHAPTER 1

INTRODUCTION

This chapter provides an introduction to the issue of occupational stress occurring in the port terminal industry. The significance of this research is also elaborated, followed by the objectives and the corresponding hypothesis. The conceptual framework of this research is presented, while the conceptual and operational definition of the related key terminologies is highlighted.

1.1 Research Background

Psychosocial hazard is one of the major group hazards in occupational safety and health (Chen et al., 2018). Sub hazard refers to the type of hazard which results in short-term stress and long-term strains. In relation to the workplace, it is known as occupational stress or work-related stress (Commonwealth of Australia Safe, 2016). Occupational stress is an inferior condition through which physical, mental, and emotional responses occur when an employee perceives that the job demands exceed their capabilities, needs, or resources (Desouky & Allam, 2017). Besides, as it results in various external and internal interactions between the employee and work environment, the long-term effects of it could contribute to psychological and physical injuries (Safe Work Australia, 2018; ILO, 2016).

Levinson (1970) stated that a career requires the devotion of almost half of an individual's time when they are awake as they dedicate their lives for their career (Mohajan, 2012). Currently, occupational stress issues have gained worldwide attention, and they have become prevalent in the area of occupational health over the last three decades. The globalisation and dramatic changes occurring in the career world develop the magnitude of the problem established by ILO (2016). Four examples of occupational stress are higher job demands and workload, employment, labour relations, work organisation and restructuring. Many organisations attempt to reduce work-related stress due to the realisation of the significant strains it causes on corporate productivity (Islam, Mohajan, & Datta, 2012).

Occupational stress was perceived in the 20th century (Schnall, Dobson, Roskam, & Elling, 2017). It was labelled in the United Nation report as "the 20th Century Disease" and "World Wide Epidemic" by World Health Organization (American Institute of Stress, 2014). It has been indicated in few studies and surveys in Malaysia that this issue occurs to organisation employees who experience occupational stress (Mallow, 2016; Mohammed, 2019; Muthiah, 2018). Therefore, it could be said that occupational stress is a silent killer for many organisations, including those in Malaysia and the port terminal industry.

Penang port remains as the key port call and the main gateway for shippers in northern Peninsular Malaysia and southern Province of Thailand. While Malaysia's economy was predicted to grow from approximately 5.0% to 5.5% in 2018, Thailand's economy raised its 2018 export outlook to 6.6% (MMC Corporation Berhad, 2017). Occupational stress issues could impede organisational excellence and employees' efficiency and productivity (Han et al., 2017). Overall, the risk of this issue is experienced by both parties. It was also found that there was inadequate research conducted on the impacts of occupational stress on port workers' safety (Lu & Kuo, 2016).

Furthermore, the organization shall identify possible threats faced by workers which term 'danger', 'hazard' and 'risk' is an important when discussing occupational safety and health (OSH) concerns. Some are identified prior any accidents or incidents happen, while others may be hard to detect at an early point of time. Generally, the mitigation measure focuses on reactive measures. The Act 514 that gazetted on 25 February 1994 specifies on objective this act to promote an occupational environment for the employee at work which is adapted to their physiological and psychological needs. Section 15 quoted that the organization shall making arrangement to ensure occupational health safety maintain safe working environment and absence of risk to health in connection with organization operation (OSHA, 1994). In compliance with the legal requirements stated in the Act 514, the organization shall ensure that each process required accessing risk, the extent of the risk exposure, and the appropriate risk control needed. The aim of a risk assessment integrates the anticipation of occupational health safety risks, which is the primary intention; it hasn't always been feasible in practice. In a case that risk extinction is not possible, the risks should then be reduced, and the residual risk appropriately managed.

Risk is a complex concept which is challenging to be described in a single sentence. A common risk assessment matrix (RAM) is the most preferred risk assessment method extensively used to assess occupational risks occurring in the organisation (Buchari, Matondang & Sembiring, 2018; Ismail et al, 2019). This common RAM been developed by DOSH (2008) which the organization could refer from the beginning to others high end risk assessment tools. The assessment of risk for psychosocial hazards is based on the same principles involved in the risk assessment for many other occupational health and safety hazards (Kennedy, 2018; Metzler & Bellingrath, 2018). The aforementioned principles are similar in a way that although all risks shall be assessed, differences may persist in the methods of assessment for several risks. Nevertheless, the practice of a common RAM also has certain limitations, which needs essential improvements to overcome its weaknesses. However, the use of a common RAM in the port industry does not provide the intended outcomes, as indicated by stagnation in the level of occurrence of accidents involving human losses (Rosa, Haddad, & de Carvalho, 2015).

The risk assessment approach and concept could also be implemented in a psychosocial hazard, specifically an occupational stress. In a comprehensive risk assessment, an evaluation must be conducted on all relevant risks occurring in the workplace, especially those which may lead to adverse health outcomes (Zoni & Lucchini, 2012). Nevertheless, it remains a complex concept to define. However, a proactive approach towards occupational stress which aims to identify and control risks is crucial. By virtue of, a new risk assessment matrix (RAM) was developed to the port industry with application

control modification factor (CMF). This study is vital in helping the port industry access occupational stress precisely and consistently.

1.2 Problem Statement

Recently, the growth and expansion of the port terminal become a positive transportation prospect in Malaysia. Furthermore, the consequences from the development of employees' experience in safety and health, including the working conditions in container terminal have been rarely discussed in systematic studies (Institute Occupational Safety and Health, 2016). A number of studies on occupational work factors have also indicated the importance of worker's health. However, no clear explanation has been made on the severity of health problems in the workplace, which could be attributed to the work environment or other psychosocial factors. The significant changes or issues which are resulted from occupational stress are no longer perceived as occasional or personal issues (Geetha, Xiuwen, Miller, Elizabeth & Yurong, 2016).

Significant changes that have taken place in the working world, in recent years the psychosocial risks have emerged, with negative consequences for organization, management, and employees. Psychosocial risks derive from deficiencies in work design, organization, and management, as well as from a problematic social working context and may have psychological, physical, and social effects such as work-related stress. Occupational stress is identified as one of the most significant challenges in the occupational health and safety fields, as it could deteriorate employees' physical and mental health. Negative physical and mental health among them could bring significant consequences to organisations (EU-OSHA, 2014). It was shown that 30% to 50% of employees in industrial and developing countries were faced with occupational stress (Oluoch, Njogu, & Ndeda, 2017). In addition, without them noticing it, this issue has also taken place in the port industry.

A 'Premier Port' holds a high standard of port services. In maintaining this status and achieving the vision and mission of these port services, extra effort and initiatives from the employees of the organisation are required (MMC Corporation Berhad, 2017). Based on the government policies implemented in support of Malaysia's port industry, the volume of cargo handles in ports has been increasing. Furthermore, Port Tanjung Pelepas (PTP), Penang Port, and Kuantan Port are faced with the issue of over-capacity in container handling when an even proportion of storage capacity is achieved (Jeevan, Chen, & Lee, 2015).

Thus, the workplace has significant impact on an individual's mental health and well-being. Working employees spend an average of eight to ten hours at workplace. A safe and healthy workplace ensures work efficiency and making work pleasurable and satisfying. Stress can be positive and negative. However, when stress becomes excessive and unmanageable it can seriously affect employee and organization too. Occupational stress is one of the sub-components in hazard category. Psychosocial hazard is factor in the design or management of work that increase of work related stress and can lead to

psychological or physical harm. Psychosocial risk factor is things that affect employee's psychological response to their work and workplace condition.

Moreover, the researches and theories regarding occupational stress have been developed and empirically tested in Western countries. Occupational stress and its consequences are significant issues in developing countries, such as Malaysia, as these countries are faced with major social and economic changes. It was found from the research and theories' gaps that Malaysia required certain resources to manage occupational stress. Overall, the perception and understanding of the elements contributing this issue are necessary for improved stress management in Malaysian organisations (Jamadin, Mohammad, Syarkawi, & Noordin, 2015).

It was found in a study that 3.2 billion employees around the world were in poor health (Global Wellness Institute, 2016). In terms of the causes of occupational stress in the workplaces in Malaysia, there were numerous other variables which were not identified (Jamadin N. et al., 2015). Furthermore, occupational stress was also found to be the number one workforce risk faced by employers across 15 countries (Global Wellness Institute, 2016). The consequences of this issue took place along with other factors at work (Takala, 2016), such as excessive workloads, inadequate control over work (Othman, Lamin, & Othman, 2014), low autonomy, and role conflict. As a whole, these factors led to health deterioration and injuries (Elizabeth, 2016).

In other sides, our country has facing a challenged in dealing with the ongoing mental health problem that are very worrying. Dzulkefly (2019) said studies shown that depression, anxiety and stress affects some 42% of women compared to 18%-19% among men. He also announced the national strategic action plan mental health awareness campaign (2019-2025). Lim Lam Thye (2015) concerned over psychosocial risk among employees, which has been identified one of the five categories of health hazard in workplace. He reminded all organizations in Malaysia which is having awareness and not ignoring work related stress since all workplace vulnerable to any health hazards especially mental disorders. It shows that this issue raised and highlighted from many parties which occupational stress in the risky state. Mental health condition referred to invisible illness but there are heavy costs to individual's health. According to the National Health and Morbidity Survey, 1 in 3 Malaysian have a mental health condition. Within context organization, 29% of employees have poor mental health at one point of time. The cost of mental illness has been estimated at RM 10.282 trillion in 2010 and is projected to reach RM 24.7 trillion in 2030. In Malaysia, there has been a three-fold increase in mental health problem among the population over the past 20 years. Malaysia does same projection that estimated loss for Malaysia would be RM43.6 billion for 2010 before it will rise to RM99.9 billion by 2030 year coming (Lee Lam, 2019).

Essentially, severe health problems could occur among employees, such as cardiovascular disease, musculoskeletal disorder, depression, and increased probability of infection if immediate actions are not taken (Wijsman, Grundlehner, Liu, Penders, & Hermens, 2013). These health issues would deteriorate for a long term and cause chronic digestive problems, osteoporosis, stomach ulcer, and coronary heart disease (Hassard et al., 2014; Peternel, Pogačnik, Tavčar, & Kos, 2012). There are multiple facets to

occupational stress, making it a more complex than other hazards, such as physical, chemical, and ergonomic hazard which could be practically managed in the workplace (Jespersen, Hasle, & Nielsen, 2016). It is clear that comprehensive methods need to be identified to assess and mitigate potential hazard as there were several arguments from previous study that risk management was not adequately emphasised in the area of occupational health and safety (Haslam, O'Hara, Kazi, Twumasi, & Haslam, 2016). Currently, occupational stress or psychosocial risk has been identified or recognized through questionnaire. Many questionnaires used to analysis this issue. In the real industry, this method not really practically used which its take time to explain and analysis this data.

There is a widespread implementation of risk assessment in the industries in Malaysia. In industry, the general risk assessment matrix has been trusted and placed as a systematic tool in evaluating risk level. As a result, it's tendency of the general risk assessment matrix to give outcome which is not consistent risk assessment results that can trigger inaccuracies during risk management actions. The organization understands with an incorrect definition and interpretation of the likelihood, probability, severity and consequences (Leveson, 2019; Satishkumar & Shrihari, 2016). The organization conduct assessments based on their experience, expertise and understanding (Al-Anbari et al., 2015). Subsequently, the organization might be misconstrue situations along with possess certain biases (Hubbard & Seiersen, 2016).

The general RAM is compatible to physical and chemical assessments (Ahmad, Mohd Zin, Othman, & Muhammad, 2016; Hus, 2014; Rout, & Sikdar, 2017; Ismail, R., et al., 2017; Abdul Rahman, Wang, & Mohamad, 2015). However, there is a limited establishment of risk assessment models which focus on the psychosocial hazard, especially occupational stress which could occur in the workplace. An ailing designed common RAM can convolute the risk rating process and generate incorrect risk levels for decision-making (Baybutt, 2017; Leveson, 2019).

Additionally, there is no risk assessment matrix which specifically focuses on the port industry. While working in the port industries, the employees were facing with a lot hazards such as physical, ergonomics and so forth. Many accidents were recorded and analysis been tracking which port activities dealing with huge equipment and machineries. Many researches was conducted in others field of industry, yet not in port industry (Yakub et al, 2014; Valipour, Yahaya, Md Noor, Antuchevičienė, & Tamošaitienė, (2017). There is also no specific legislative provision which is concerned on workplace stress or psychosocial harm. Despite the positive attributes of the existing risk assessment on occupational stress, it is not possible for the risk matrix to quantify the risk. It could be seen that there is a clear gap between the theory and the implementation of risk assessment on occupational stress in Malaysia. Therefore, a risk assessment matrix desires to be established and adapted to suit the context. To accomplish this requirement, some data required must be available and accessible to reviewed and referred. Therefore, to overcome the adverse effects of using the existing risk assessment matrix, adding another dimension of the likelihood and severity of predictors is crucial. This addition would ensure the capability and efficiency in reducing occupational stress in Malaysia's port industry. The primary interest of this study is the methods of assessing the risk of occupational stress in the port industry.

1.3 Study Justification

Occupational stress leads to the occurrence of serious issues in various workplaces. Compared to many other occupational health problems, regulating occupational stress is considered as more challenging. Therefore, it is widely acknowledged as an aspect to be prioritised in occupational safety and health, particularly the significant well-documented health issues, namely mental and physical health issues.

Numerous works of research, which were related to the port industry concentrated on the issues of technical-based and engineering designs or the mathematical modelling of risk analysis technique in Malaysia. Few of the studies emphasised on employees' work experience or leadership's safety culture. However, there was a limited approach used in understanding the impacts on employees' health and safety, which was the root of an organisation's sustainability. Moreover, occupational stress led to various quantitative or qualitative methods and approaches. There are two approaches used in detecting occupational stress, where the first approach involved the use of questionnaires. Meanwhile, the second approach involved the use of risk matrix. In the current study, the aforementioned approaches to detect occupational stress in time need to be applied to take the necessary measures.

Occupational stress levels are practically evaluated through a self-reported questionnaire, which is conducted from time to time. However, this process is not adequate to identify the indirect changes which may develop into more severe issues. Through these methods, the damage would have already been done by the time the diagnosis takes place. Moreover, self-reported questionnaires are subjective, and they rely on the subjects' ability to recall their past experiences and awareness of the situations. These traits are not reliable as they may lead to inaccurate measurement of stress levels.

In respect of advanced technologies, the method of measuring occupational stress level is upgraded using software and systematic monitoring. The technology is supposed to possess intelligence, such as Smart Environments or Smart Offices. However, not all industries could afford to sustain the cost of this innovation. Meanwhile, risk assessment is another technique used to conduct a simple estimation of stress levels. It is the primary method to determine occupational safety and healthy decision to be done for many types of hazards, including occupational stress.

Occupational Safety Health Act 1994's objective is to secure the safety, health, and welfare of employees against the risks to safety or health occurring within the activities carried out by the employees. This objective is equivalent to employers' responsibility in maintaining the working environment for the employees while avoiding health risks. Generally, organisational or industrial practitioners possess insufficient information or awareness of the evaluation of occupational stress hazard. Risk assessment is a method used to assess occupational stress, a type of hazard which is similar to other types. As far as this subject is concerned, there is inadequate study and literature emphasising on the assessment of occupational stress risks. Therefore, this research aims to provide insights regarding this matter. This objective is in accordance with the 11th Malaysian Plan,

which gave a high priority to the protection of employees. The main strategy Occupational Safety and Health Master Plan (2016-2020) is the inculcation of Preventive Culture at the workplace. This approach is in line with the new introduction of occupational stress risk assessment matrix, which was developed with the similar aforementioned objective which developed nation and to transform the nation in order to achieve the goal of a Preventive Culture by 2020.

This study aims to provide an overview of occupational stress risk assessment method and indirectly achieve a solution for the port industry to manage occupational stress risks. Accordingly, a semi-quantitative risk matrix model which focused on occupational stress was developed. The risk matrix application was implemented to perform a decision making process regarding risk acceptance and to determine which risk to be prioritised and addressed first. Occupational Stress Risk Assessment Matrix (OSRAM) development could be used to effectively identify the occupational stress symptoms at an early stage. An OSRAM has been used to benefit from characterising high-risk port activities and thus promoting the OSH climate at the workplace. The first step of any intervention process is a prompt assessment of the overall risk and other factors, the screening of the risk of further self-harm, and the development of long-term mitigation measures. The result of risk is used to develop interventions or policies to reduce exposure to risk factors.

Employees in the port industry are subject to risks that are difficult to quantify remaining to the actual or abnormal nature of activities of this field. This scenario can significantly modify the array of hazards encountered monthly, weekly, or daily (Mehta & Agnew, 2010). The Malaysian industry shall evaluate the risks of potential hazard at work, develop strategies to prevent workplace risk factors and minimise their seriousness (CIDB, 2019; Department of Occupational Safety & Health [DOSH], 2015). The psychosocial hazard was not to be considered due to difficulty in assessing and less awareness on these issues. It is due to the crucial of the port industry as one of the most significant economic sectors in any nation, strongly linked to other financial sectors and heavily dependent on labour-intensive jobs.

Accordingly, this study offers insights into the establishment of a new Occupational Stress (OS) RAM, using the available accurate and reliable data integrated with the CMF of occupational stress. This OSRAM deals with hazards arising from daily activities that grouped in occupational risk factors. The OSRAM is also part of a defined process intended to provide the best available data to OSRAM users and decision-makers, thus assisting in resolving some intrinsic inaccuracies in outcomes of and decisions taken using a common or existing RAM approach.

In addition, OSRAM would be a highly credible instrument in creating effective method of occupational stress management and intervention to all categories of employees. This study also offers potential as a good basis and reference, as it guides future studies regarding occupational stress risk assessment and its related risk factors. It is also capable of determining which risk to be prioritised and addressed first.

1.4 Research Question

- i. What is the level of workplace stress at the port terminal?
- ii. What are the risk factors which contribute to occupational stress occurring at the port terminal?
- iii. What are the elements emphasised by the port industry when managing the process of risk assessment?
- iv. How could risk assessment determine the appropriate risk level for occupational stress?

1.5 Research Objective

1.5.1 General Objective

This study primarily aims to develop a semi-quantitative risk assessment matrix for occupational stress in Penang's port industry.

1.5.2 Specific Objectives

For specific objective consists of two phases namely:

Phase I

- i. To determine the socio-demographic characteristics of respondents
- ii. To determine the prevalence of occupational stress level using JCQ among respondents
- iii. To determine the relationship between socio-demographic characteristics and the occupational stress level among respondents
- iv. To determine the relationship between risk factors and occupational stress level among the employees in port terminal operation
- v. To determine the risk factors of occupational stress in the port industry by conducting SEM analysis

Phase II

- vi. To develop OSRAM consists of likelihood using JCQ, severity, and control modification factor using OHSMQ of risk assessment for occupational stress in the port industry
- vii. To implement the occupational stress risk assessment matrix (OSRAM) in the container terminal port
- viii. To compare the level of occupational stress based on the current risk matrix, and stress scale (DASS), and OSRAM in the selected work activities

1.6 Hypothesis

- i. There is a high prevalence of occupational stress among the respondents.
- ii. There is a significant relationship between socio-demography and occupational stress level among the employees in the port terminal operation.
- iii. There is a significant relationship between risk factors and occupational stress level among the employees in the port terminal operation worker.
- iv. Based on the SEM analysis, risk factor significantly contributes to occupational stress in the port industry.
- v. There is a significant difference between the current risk matrix, stress scale (DASS), and OSRAM.

1.7 Conceptual and Operational Definitions

Conceptual and operational definitions are parts of the study reference regarding the methods of understanding the research. The conceptual definition refers to the concept of a study, while operational definition refers to the method of the study's measurement. The conceptual and operational definitions of hazard, risk, risk assessment, and risk levels are presented in Table 1.1.

Table 1.1 : Conceptual and Operational Definitions

Variables	Conceptual Definition	Operational Definition
Hazard	A source or situation with a potential for harm or health risk, damage to property, the environment, or a combination of both damages (MS IEC/ISO 31010:2011)	The hazard which is determined during observation and self-report questionnaires with employees
Risk	The combined likelihood of the occurrence of risk with a specified period and the severe damage to people and the environment's health (AS/NZS ISO 31000:2009)	Risk which is obtained from the likelihood of hazard from activity and severity of the work activity hazard
Risk Assessment	The process of evaluating the risks to safety and health, which are formed through the hazards at work (Matheus & Oliveira, 2015)	The risk assessment which involves hazard identification, risk analysis, and risk control
Risk levels	Risk levels refer to the categorisation of risk from the extreme, high, medium, significant, and low levels (Safety, Health, and Environment, 2014; Pryor & Capra, 2012)	Risk level which is resulted from the final calculation of risk

1.8 Conceptual Framework

A conceptual framework is a structure which elaborates the study through the independent variable (IV) and dependent variable (DV). In Figure 1.1, the conceptual framework of this study is presented. Based on the figure, the two factors which are highlighted in purple are socio-demographic and organisational factors. To be specific, demographic factors consist of age, ethnicity, educational background, marital status, monthly income, and duration of employment, while organisational factors refer to workload and time pressure, job conditions and hours of work, role conflict, career planning, workplace violence, and interpersonal relations. The risk assessment could be conducted through individual or job activity among employees. Moreover, there were several factors which could be considered as risk factors which resulted in occupational stress, such as perception, past experience, social support, individual differences, work exposure, environmental condition, adjustment and adaptation response, and individual differences. The influence factors refer to the impacts posed on the respondent, which would affect this study overall.

Several procedures were taken in occupational stress risk assessment matrix, such as hazard identification, risk analysis, and risk evaluation. This was followed by the acquirement of occupational stress level. There were several evaluation formulae which were applied for the calculation of the level of occupational stress.

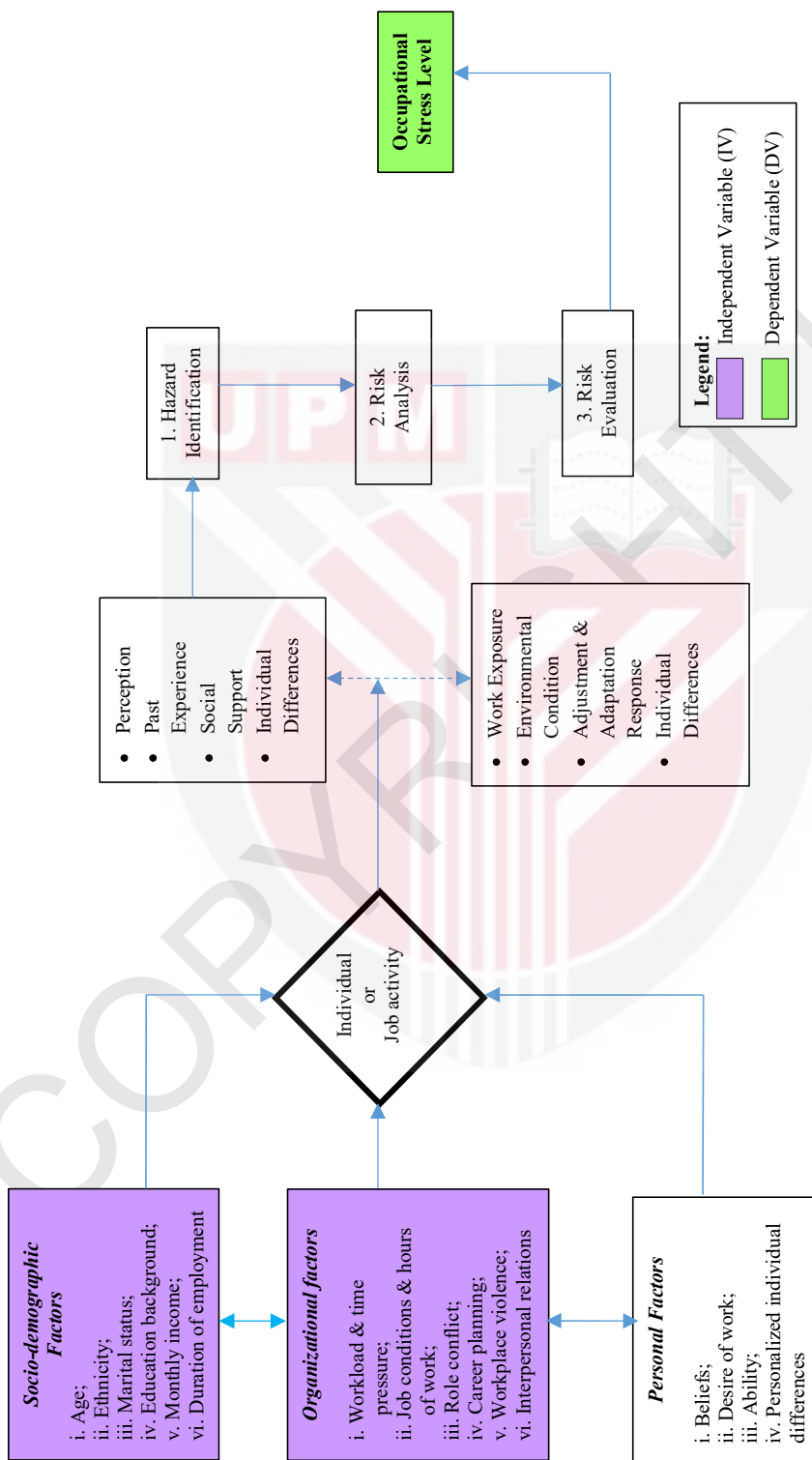


Figure 1.1 : Framework Risk Assessment on Occupational Stress

REFERENCES

- Abera, K., (Occupational Health and Safety in Ethiopia: A review of Situational Analysis and Needs Assessment. *Ethiopia Journal Health Development*, 30(1).
- Abdul Rahman, H., Wang, C., & Mohamad, F. (2015). Implementation of Risk Management in Malaysian Construction Industry: Case Studies. *Journal of Construction Engineering*. 2015. 1-6. doi: 10.1155/2015/192742
- Abdul Rahman, H., Abdul-Mumin. K., Naing, L., (2017). Psychosocial factors, work-related musculoskeletal disorders and work-related fatigue amongst nurses in Brunei: structural equation model approach *Int Emerg Nurs*, 34. p. 17-22.
- Adebayo, S., & Ogunsina, S. (2011). Influence of supervisory behaviour and job stress on job satisfaction and turnover intention of police personnel in Ekiti State. *Journal of Management and Strategy*. 2(3). 13.
- Afthanorhan, A., Awang, Z., Rashid, N., Foziah, H., & Ghazali, P. (2019). Assessing the effects of service quality on customer satisfaction. *Management Science Letters*, 9(1), 13-24.
- Ahmad, A., Mohd Zin, I., Othman, K., & Muhammad, H. (2016). Hazard Identification, Risk Assessment and Risk Control (HIRARC) Accidents at Power Plant. MATEC Web of Conferences. 66. 1-6. doi: 10.1051/ 20166
- Ahmed, S. (2009). Methods in sample surveys. Johns Hopkins Bloomberg School of Public.
- Ahmed, A., & Ramzan, M. (2013). Effects of job stress on employees job performance a study on banking sector of Pakistan. *IOSR Journal of Business and Management*, 11(6), 61-68.
- Aimran, A. N., Ahmad, S., Afthanorhan, A., & Awang, Z. (2017, May). The assessment of the performance of covariance-based structural equation modeling and partial least square path modeling. In *AIP Conference Proceedings* (Vol. 1842, No. 1, p. 030001). AIP Publishing LLC.
- Ainur, A. K., Sayang, M. D., Jannoo, Z., & Yap, B. W. (2017). Sample Size and Non-Normality Effects on Goodness of Fit Measures in Structural Equation Models. *Pertanika Journal of Science & Technology*, 25(2).
- Akademisains. (2015). Mega Science 3.0 Final Report Furniture Industry Sector. Malaysia: Akademi Sains .
- Akhtar, A. N. Naureen, S., Khan, I. A., & (2019). Prevalence Of Emotional Disturbances Among Cardiac Patients: A Comparative Analysis. *PAFMJ*, 69(Suppl 1), S53-8.
- Akinori, N., Takashi, H., Masaya, T., Norito, K., Heihachiro, A., Fumio, K., Shunichi, A. (2004). Job stress, social support, and prevalence of insomnia in a population of Japanese daytime workers. *Social Science & Medicine*. 59. 1719–1730.
- Alipoor, F. (2014). The Influence Of Role Overload, Role Conflict And Role Ambiguity On Occupational Stress Among Nurses In Selected Iranian Hospitals. *International Journal of Asian Social Science*, 4(1): 34- 40.

- Al-Anbari, S., Khalina, A., Alnuaimi, A., Normariah, A., & Yahya, A. (2015). Risk assessment of safety and health (RASH) for building construction. *Process Safety and Environmental Protection*. 94. 149-158.
- Almada, Lobo., (2015). The Industry 4.0 revolution and the future of Manufacturing Execution Systems (MES); Critical Manufacturing. *Journal of Innovation Management* p. 16-21
- Ale, B., Burnap, P., & Slater, D. (2015). On the origin of PCDS: (Probability consequence diagrams). *Safety Science*. 72. 229–239.
- America's Essential Hospitals. (2016). Sociodemographic Factors Affect Health Outcomes. Retrieved from <https://essentialhospitals.org>
- American Psychological Association (APA). (2020). <https://dictionary.apa.org/psychosocial>
- Aminbakhsh, S., Gunduz, M., & Sonmez, R. (2013). Safety risk assessment using analytic hierarchy process (AHP) during planning and budgeting of construction projects. *Journal of Safety Research*. 46. 99–105.
- Andrea, C., (2017). "Risk-based thinking according to ISO 9001:2015 standard and the risk sources European manufacturing SMEs intend to manage", *The TQM Journal*. 29(2). 310-323. doi : 10.1108/04-2016-0038
- Anna, L. S., Doncho, D., , Nina, J. K., Srećko, G. (2017). Concepts and definitions of health and health-related values in the knowledge landscapes of the digital society. *Knowledge Landscapes. Croat Med J*. 58:431-5.
- Anthony. A., & Cox, L., (2008). What's wrong with risk matrices? *Risk Analysis: An International Journal*. 28(2). 497–512.
- Appley, M. H., & Trumbull, R. A. (Eds.). (2012). *Dynamics of stress: Physiological, psychological and social perspectives*. Springer Science & Business Media.
- AS/NZS ISO 31000. (2009). *Risk Management -Principles and Guidelines*. Standards Australia/Standards. New Zealand: Sydney/Wellington
- Arica, E., & Powell, D. J. (2017, December). Status and future of manufacturing execution systems. In *2017 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)* (pp. 2000-2004). IEEE.
- Arma, N. & Ismail, I., (2016). Occupational Stress and Its Associated Factors among Academician in A Research University, Malaysia. *Malaysian Journal of Public Health Medicine*. 16(1). 22-39.
- Asgari, B., Pickar, P., & Garay, V. (2016). Karoshi and Karou-jisatsu in Japan: causes, statistics and prevention mechanisms. *Asia Pacific Business & Economics Perspectives*. 4(2). 49-72
- Asgher, U., Ali. T, Ahmad. R, Taiar, Moraru, R. (2015). A comparative study on organizational stress in South Asian cultures. 6th International Conference on Applied Human Factors and Ergonomics (AHFE 2015) and the Affiliated Conferences, AHFE 2015. *Procedia Manufacturing* 3. 3963 – 3970
- Asnawi, A., Awang, Z., Afthanorhan, A., Mohamad, M., & Karim, F. (2019). The influence of hospital image and service quality on patients' satisfaction and

- Australian Psychological Association (APA). (2013). APS - EQIP - Information sheets - Stress.
- Awang, Z., Hoque, A., Muda, H., & Salleh, F. (2017). The Effects of Crowdfunding on Entrepreneur's Self-Belief: *International Academic Conference on Business and Economics*
- Aziz, MI., Afthanorhan, A., and Awang, Z. (2016). Talent development model for a career in Islamic Banking Institutions: A SEM approach. *Cogent Business and Management*, 3(1186259), 1-11. <https://doi.org/10.1080/23311975.2016.1186259>
- Azizah A., Rozainee K. , Nada I., Izreen S. and Norhafizah Z. (2016) The prevalence of occupational stress and its association with socio-demographic factors among lecturers in a private university in Malaysia. *International Journal of Public Health and Clinical Sciences*. 3(4). p.63-70.
- Azlan, S., Rosnah, I., & Rizal, M., (2017). Systematic Review Of Organization Stressors As Predictors For Job Stress And Burnout Among University Academicians In Malaysia. *International Journal of Public Health and Clinical Sciences*. 4(3). 35–46.
- Azma, K., Hosseini, A., Safarian, M., & Abedi, M. (2015). Evaluation of the relationship between musculoskeletal discomforts and occupational stressors among nurses. *North American Journal of Medical Sciences*, 7(7). 322.
- Babanataj, R., Mazdarani, S., Hesamzadeh, A., Gorji, M. H., & Cherati, J. Y. (2019). Resilience training: Effects on occupational stress and resilience of critical care nurses. *International journal of nursing practice*, 25(1), e12697.
- Bagozzi, R., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*. 16(1). 74-94
- Bahaman, A. S., Mastura, J., Sofian, M., Fauzee, O., Salleh, A. R., & Muhammad Nazrul, S. (2012). Effect of low-impact aerobic dance exercise on psychological health (stress) among sedentary women in Malaysia.
- Bahkia, A. S., Awang, Z., Afthanorhan, A., Ghazali, P. L., & Foziah, H. (2019). Exploratory factor analysis on occupational stress in the context of Malaysian sewerage operations. Paper presented at the AIP Conference Proceedings. <https://doi.org/10.1063/1.5121111>
- Baistaman, J., Awang, Z., Afthanorhan, A., & Rahim, M. Z. A. (2020). Developing and validating the measurement model for financial literacy construct using confirmatory factor analysis. *Humanities & Social Sciences Reviews*, 8(2), 413-422.
- Bailey, T., Dollard, M., McLinton, S., & Richards, P., (2015). Psychosocial safety climate, psychosocial and physical factors in the aetiology of musculoskeletal disorder symptoms and workplace injury compensation claims. *Work & Stress*, 29(2). 190–211.
- Balogh, I., Arvidsson, I., Björk, J., Hansson, G. Å., Ohlsson, K., Skerfving, S., & Nordander, C. (2019). Work-related neck and upper limb disorders—quantitative

- exposure–response relationships adjusted for personal characteristics and psychosocial conditions. *BMC musculoskeletal disorders*, 20(1), 1-19.
- Bao, C., Li, J., & Wu, D. (2018). A fuzzy mapping framework for risk aggregation based on risk matrices. *Journal of Risk Research*, 21(5), p.539–561.
- Bakker, A. Demerouti, E., & Sanz-Vergel, A. (2014). Burnout and work engagement: The JD–R approach. *Annu. Rev. Organ. Psychol. Organ. Behav.*, 1(1). 389-411.
- Basu, S. (2016). Plant hazard analysis and safety instrumentation systems. Academic Press.
- Batista-Taran, L., & Reio, G. (2013). Occupational stress: Towards an integrated model. In Plakhotnik, N., & Pane D., Proceedings of the Tenth Annual College of Education & GSN Research Conference. 9-16. Miami: Florida International University. Retrieved from <http://coeweb.fiu.edu>
- Baqutayan, S. M. S. (2015). Stress and coping mechanisms: A historical overview. *Mediterranean Journal of Social Sciences*, 6(2 S1), 479-479.
- Baybutt, P. (2017). Guidelines for Designing Risk Matrices. *Process Safety Progress*, 00(00). <https://doi.org/10.1002/prs>
- Beheshtifar, M., Hoseinifar, H., & Moghadam, M. (2011). Effect procrastination on work-related stress. *European Journal of Economics, Finance and Administrative Sciences*. 38. 59–64.
- Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of affective disorders*, 173, 90-96.
- Bennett, H., & Work, H. Stress Risk Assessment The key to tackling stress in the workplace. Hrinz.org.nz
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological bulletin*, 107(2), 238.
- Bermudez, B., Seoane, M., & Laxe, F. (2019). Efficiency and productivity of container terminals in Brazilian ports (2008–2017). *Utilities Policy*. 56. 82–91. doi : 10.1016/2018.11.006
- Boas, M. V., & Cerqueira, A. (2017). Assessing stress at work: The Portuguese version of the Job Content Questionnaire. *Avaliação Psicológica: Interamerican Journal of Psychological Assessment*, 16(1), 70-77.
- Bowen, P., Edwards, P., Lingard, H., & Cattell, K. (2014). Occupational stress and job demand, control and support factors among construction project consultants. *International Journal of Project Management*. 32(7). 1273–1284.
- Bouloiz, H., Garbolino, E., Tkiouat, M., & Guarnieri, F. (2013). A system dynamics model for behavioral analysis of safety conditions in a chemical storage unit. *Safety Science*, 58, 32–40. <https://doi.org/10.1016/j.ssci.2013.02.013>
- Brown, T. A., Chorpita, B. F., Korotitsch, W., & Barlow, D. H. (1997). Psychometric properties of the Depression Anxiety Stress Scales (DASS) in clinical samples. *Behaviour research and therapy*, 35(1). 79-89.

- Buchari, Matondang, N., & Sembiring, N. (2018). Work environment engineering using HIRARC and 5S method. *AIP Conference Proceedings*, 1977, 0200008. <https://doi.org/10.1063/1.5042864>
- Bucci, N., Luna, M., Vilorio, A., García, J. H., Parody, A., Varela, N., & López, L. A. B. (2018, June). Factor analysis of the psychosocial risk assessment instrument. In *International Conference on Data Mining and Big Data* (pp. 149-158). Springer, Cham.
- Commonwealth of Australia Safe. (2016, November 30). Fundamentals for Industry. Sub-Element 13: Psychosocial hazards. Retrieved from <http://www.defence.gov.au>
- Cezar-Vaz, M., Bonow, C., Almeida, M., & Cardoso, L. (2016). Workload and associated factors: a study in maritime port in Brazil. *Revista Latino-Americana de Enfermagem*, 24.
- Centers of Disease Control and Prevention (CDC). (2013). Quality of Worklife Questionnaire. Stress At Work: National Institute for Occupational Safety and Health. Retrieved from: <https://www.cdc.gov>
- Chandler, M. D., Bunn, T. L., & Slavova, S. (2017). Narrative and quantitative analyses of workers' compensation-covered injuries in short-haul vs. long-haul trucking. *International Journal Of Injury Control And Safety Promotion*, 24(1), 120-130.
- Charara, R., Bcheraoui, C., Kravitz, H., Dhingra, S., & Mokdad, H. (2016). Mental distress and functional health in the United States. *Preventive Medicine*, 89, 292–300. doi : 10.1016/2016.06.011
- Chawla, V., Guda, S., (2010). Individual Spirituality at Work and Its Relationship with Job Satisfaction, Propensity to Leave and Job Commitment: An Exploratory Study among Sales Professionals. *J Hum Values*, 16:157-67.
- Chin Hup, C. A., (2020) Malaysia's National Port Strategy for Smart Port Development. Centre for Maritime Economics & Industries. Maritime Institute of Malaysia pg 1-10 United Nations Economic & Social Commission for Asia & the Pacific.
- Chen, W. L., Wang, C. C., Chiang, S. T., Wang, Y. C., Sun, Y. S., Wu, W.T., Liou, S. H. (2018). The impact of occupational psychological hazards and metabolic syndrome on the 8-year risk of cardiovascular diseases - A longitudinal study. *Journal of PLoS One*, 13(8), e0202977. doi: 10.1371/0202977
- Chen, J., de la Torre, J., & Zhang, Z. (2013). Relative and absolute fit evaluation in cognitive diagnosis modeling. *Journal of Educational Measurement*, 50(2), 123-140.
- Chen, S., Haniff, J., Siau, C., Seet, W., Loh, S., & Abdul, M. (2014). Burnout in Academics: An empirical study in private universities in Malaysia. *The International Journal of Social Sciences and Humanities Invention*, 1(2), 62–72.
- Cheng, C., & Wu, H. (2017). Confidence intervals of fit indexes by inverting a bootstrap test. *Structural Equation Modeling: A Multidisciplinary Journal*, 24(6), 870-880.
- Chim, B. L. H., Chun, C. J., & Wah, F. K. (2018). Accidents in Construction Sites: A Study on the Causes and Preventive Approaches to Mitigate Accident Rate. *Inti Journal*, 1(3), 1–12. Retrieved from <http://eprints.intimal.edu.my/1136/>

- Cunanan, A. J., DeWeese, B. H., Wagle, J. P., Carroll, K. M., Sausaman, R., Hornsby, W. G., & Stone, M. H. (2018). The general adaptation syndrome: a foundation for the concept of periodization. *Sports Medicine*, 48(4), 787-797.
- Coker, A. O., Coker, O. O., & Sanni, D. (2018). Psychometric properties of the 21-item depression anxiety stress scale (DASS-21). *African Research Review*, 12(2), 135-142
- Construction Industry Development Board [CIDB]. (2018b). *Occupational Safety and Health - Specification and Bill of Quantities (BQ) for Construction Works (CIS 27)*. Retrieved from <http://www.cidb.gov.my/images/content/pdf/cis/standard/CIS-27-2019-OCCUPATIONAL-SAFETY-AND-HEALTH.pdf>
- Cook, R. (2012). Simplifying the Creation and Use of the Risk Matrix. RPS Health, Safety and Environment. 1-26
- Corradini, I., Marano, A., & Nardelli, E. (2016). Work-related stress risk assessment: a methodological analysis based on psychometric principles of an objective tool. *SAGE Open*, 6(3), 2158244016666888
- Cosio, S., (2011). Social support and occupational stress among university employees. Dissertation. Non-publish. Regent University.
- Cox, T., Griffiths, A., & Randall, R. (2003). A risk management approach to the prevention of work stress. *The Handbook of Work and Health Psychology*. Chapter 10: A Risk Management Approach to the Prevention of Work Stress. 191. doi : 10.1002/0470013400
- Cox, L., (2010). What's wrong with risk matrices? *Risk Analysis*. *An International Journal*. 28(2). 497-512.
- Dalboge, A., Frost, P., Andersen, J. H., & Svendsen, S. W. (2014). Cumulative occupational shoulder exposures and surgery for subacromial impingement syndrome: a nationwide Danish cohort study. *Occupational and environmental medicine*, 71(11), 750-756.
- Desouky, D., & Allam, H. (2017). Occupational stress, anxiety and depression among Egyptian teachers. *Journal of Epidemiology and Global Health*. 7(3). 191-198. doi: 10.1016/002
- Diana, L., (2009). Quantitative, Semi-quantitative and Quantitative methods for risk assessment: case of the financial audit. 643-657. University of Iasi.
- Dimoff, J., & Kelloway, E., (2013). Bridging the gap: Workplace mental health research in Canada. *Canadian Psychology/Psychologie Canadienne*, 54(4), 203.
- Dejan, R. (2013). A tool for risk assessment. *Safety Engineering* 3(7).
- Department Standard Malaysia, (2010). *Risk Management - Principles and guidelines (ISO 31000:2009)*
- Department of Occupational Safety and Health (DOSH). (2008). *Guidelines for Hazard Identification, Risk Assessment and Risk Control (HIRARC)*. 1-31 JKPP DP 127/789/4-47. ISBN 978-983-2014-62-1
- Department of Occupational Safety and Health [DOSH]. (2015). *Guideline on Contract*

Management. Retrieved from <https://www.dosh.gov.my/index.php/legislation/guidelines/general/2260-01-guidelines-on-contract-management/file>

- Department of Occupational Safety and Health (DOSH). (1994). Laws of Malaysia. Occupational Safety and Health Act 514. Part IV General duties of employers: Section 15 General duties to their employees. 10. MDC Publication Sdn Bhd.
- Department of Defense. (1993). MIL-STD-882C. Military Standard System Safety Program Requirements.
- Department of Defense. (2012). MIL-STD-882E. Military Standard Practice System Safety.
- De Jong, G. (1999). Causal loops in long-term supply relationships: Theory and evidence from the United States, Japan, and Europe. Unpublished PhD thesis. SOM, University of Groningen, the Netherlands.
- Dextras-Gauthier, J., Marchand, A., & Haines III, V. (2012). Organizational culture, work organization conditions, and mental health: A proposed integration. *International Journal of Stress Management*, 19(2), 81.
- Donoghue, A. (2001). The design of hazard risk assessment matrices for ranking occupational health risks and their application in mining and minerals processing. *Occupational medicine*. 51(2). 118-123.
- Duxbury, L., Stevenson, M., & Higgins, C. (2018). Too much to do, too little time: Role overload and stress in a multi-role environment. *International Journal of Stress Management*, 25(3), 250.
- Edimansyah, B., Rusli, B., Naing, L., & Mazalisah, M. (2006). Reliability and construct validity of the Malay version of the Job Content Questionnaire (JCQ). *Southeast Asian Journal of Tropical Medicine and Public Health*. 37(2). 412.
- Edwards, R. R., Dworkin, R. H., Sullivan, M. D., Turk, D. C., & Wasan, A. D. (2016). The role of psychosocial processes in the development and maintenance of chronic pain. *The Journal of Pain*, 17(9), T70-T92.
- Elizabeth, B. (2016). The regulation and governance of psychosocial risks and work: a comparative analysis across countries. In Part 3 society, safety and health. Global Collaborative Research 2016: Financial Regulation/Society, Safety & Health/Trade & Investment. Korea.
- Endroyo, B., Yuwono, B., & Mardapi, D. (2015). Model of learning/training of Occupational Safety & Health (OSH) based on industry in the construction industry. *Procedia Engineering*. 125. 83–88.
- Ertel, M., Stilijanow, U., Iavicoli, S., Natali, E., Jain, A., & Leka, S. (2010). European social dialogue on psychosocial risks at work: Benefits and challenges. *European Journal of Industrial Relations*. 16(2). 169–183.
- European Union. (2013). European Opinion Poll on Occupational Safety and Health. European Agency for Safety and Health at Work (EU-OSHA). Luxembourg. ISBN: 978-92-9240-065-1 doi: 10.2802/55505
- EU Commission. (2012). Directive 89/391/EEC-OSH “Framework Directive” of 12 June 1989 on the introduction of measures to encourage improvements in the safety

- and health of workers at work-”Framework Directive”. *Journal of the European Community*. (2).182
- EU-OSHA. (2014). Psychosocial risks in Europe: Prevalence and strategies for prevention. Luxembourg. Office of the European Union. Retrieved from: <https://osha.europa.eu>
- Evans, G., Becker, F., Zahn, A., Bilotta, E., & Keesee, A., (2012). Capturing the ecology of workplace stress with cumulative risk assessment. *Journal of Environment and Behavior*, 44(1). 136–154. doi : 10.1177/ 0013916510389
- Faragher, B., Cartwright, S., & Cooper, C. (2004). An Organizational Stress Screening Tool (ASSET). *Journal of Stress and Health*. 20(4). 189-201. doi: 10.1002/1010
- Farrer, L., Gulliver, A., Bennett, K., Fassnacht, D., & Griffiths, K. (2016). Demographic and psychosocial predictors of major depression and generalised anxiety disorder in Australian university students. *BMC psychiatry*, 16(1), 241.
- Fei, L. K., Kuan, N. Y., Yang, F. C., Hing, L. Y., & Yaw, W. K. (2017). Occupational Stress among Women Managers. *Global Business & Management Research*, 9.
- Fejfer, K., (2015). Port and terminal management. Institute of Chartered Shipbrokers. London. Retrieved from <https://www.ics.org.uk>. ISBN 978-1-908833-63-1
- Feng, Y., Teo, E. A. L., Ling, F. Y. Y., & Low, S. P. (2014). Exploring the interactive effects of safety investments, safety culture and project hazard on safety performance: An empirical analysis. *International Journal of Project Management*, 32(6), 932–943. <https://doi.org/10.1016/j.ijproman.2013.10.016>
- Feng, Y. (2013). Effect of safety investments on safety performance of building projects. *Safety Science*, 59, 28–45. <https://doi.org/10.1016/j.ssci.2013.04.004>
- Ferreira, N., Santos, G., & Silva, R. (2019). Risk level reduction in construction sites: Towards a computer aided methodology—A case study. *Applied Computing and Informatics*, 15(2). 136-143.
- Fern, S. W. (2018). Work-injury Management and Return-to-work in the Manufacturing Industry in Selangor, Malaysia
- Flage, R., Aven, T., Zio, E., & Baraldi, P. (2014). Concerns, challenges, and directions of development for the issue of representing uncertainty in risk assessment. *Risk analysis*, 34(7), 1196-1207.
- Finney, C., Stergiopoulos, E., Hensel, J., Bonato, S., & Dewa, C. (2013). Organizational stressors associated with job stress and burnout in correctional officers: a systematic review. *BMC Public Health*. 13(1). 82.
- Folkman, S., (2013). Stress: appraisal and coping. In *Encyclopedia of behavioral medicine*. 1913–1915. Springer.
- Folkman, S., Lazarus, R., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology*. 50(5). 992-1003.
- Frazier, S., & Parker, S. (2018). Measurement of physiological responses to acute stress in multiple occupations: A systematic review and implications for front line healthcare providers. *Translational Behavioral Medicine*, 9(1). 158-166.

- Fung, I. W., Tam, V. W., Chu, J. O., & Le, K. N. (2020). A Stress-Strain Model for resilience engineering for construction safety and risk management. *International Journal of Construction Management*, 1-17.
- Gebisa, G., & Sintayehu, D., (2020). Perceived work-related stress and its associated factors among public secondary school teachers in Gondar city: a cross-sectional study from Ethiopia. *BMC Research Notes*, 13(36).
- Gebisa, G., Kabito, Wami, S. D., Chercos, D. H., & Mekonnen, T. H. (2020). Work-related Stress and Associated Factors among Academic Staffs at the University of Gondar, Northwest Ethiopia: An Institution based Cross-sectional Study. *Ethiopian journal of health sciences*, 30(2).
- Geetha, M., Xiuwen, S., Miller, T., Elizabeth, H., & Yurong, M. (2007). Costs of occupational injuries in construction in the United States. *Accident Analysis & Prevention*, 39(6). 1258-1266.
- Global Wellness Institute. (2016). The Future of Wellness at Work. January 2016. Received from: www.globalwellnessinstitute.org.
- Gomez, F. (2016). A guide to the depression, anxiety and stress scale (DASS 21). Central and Eastern Sydney primary health networks.
- Gopinath, R., & Kalpana, R. (2020). Relationship of job involvement with Job Satisfaction. *Adalya Journal*, 9(7), 306-315.
- Goswami, T. G. & Burman, R., (2018). A systematic literature review of work stress. *International Journal of Management Studies*, 5(3-9), 112-132.
- Grover, S., Sahoo, S., Bhalla A, Avasthi, A., (2018). Psychological problems and burnout among medical professionals of a tertiary care hospital of North India: A cross-sectional study. *Indian Journal Psychiatry*. 60(2):175-188.
- Guan S, Zhao J, & Wang L, (2014). The relationship between mental health and job burnout among different working years professional people. *J North Sichuan Med Coll* 29.16–9.
- Guglielmi, D., Depolo, M., & Violante, F. (2013). The evaluation of psychosocial risks in the workplace: The case of Italy. In C. M. Navarrete, & E. G. Vicente (Eds.), *Evaluation development of psychosocial risks in Europe: The state of scientific research and institutional experiences*.
- Haas, E., & Yorio, P. (2016). Exploring the state of health and safety management system performance measurement in mining organizations. *Safety Science*. 83. p. 48–58.
- Hadi, A. A., Naing, N. N., Daud, A., & Nordin, R. (2006). Reliability and construct validity of the Malay version of the Job Content Questionnaire (JCQ) among secondary school teachers in Kota Bharu, Kelantan, Malaysia. *Southeast Asian journal of tropical medicine and public health*, 37(6), 1254.
- Hair Jr, J. F., Wolfinbarger, M., Money, A. H., Samouel, P., & Page, M. J. (2015). *Essentials of business research methods*: Routledge. <https://doi.org/10.4324/9781315704562>

- Hallikainen, H., Alamäki, A., & Laukkanen, T. (2019). Individual preferences of digital touchpoints: A latent class analysis. *Journal of Retailing and Consumer Services*, 50, 386-393.
- Han, L., Zhang, Q., Chen, X., Zhan, Q., Yang, T., & Zhao, Z. (2017). Detecting work-related stress with a wearable device. *Journal of Computers in Industry*, 90, p. 42–49. doi: 10.1016/2017.05.004
- Hansez, I., (2008). The “Working conditions and control questionnaire” (WOCCQ): Towards a structural model of subjective stress. *Journal of European the Psychology Applied*. 58. p.253-262. doi : 10.1016/2008.09.008
- Haslam, C., O’Hara, J., Kazi, A., Twumasi, R., & Haslam, R. (2016). Proactive occupational safety and health management: Promoting good health and good business. *Journal of Safety Science*. 81. p.99–108. doi : 10.1016/2015.06.010
- Hasrul, N., Ngadiman, A., Mansur, R., Sirat, R., & Mohd, M. F. (2019). Safety and Risk Evaluation using HIRARC Model at Palm Oil Mill. *International Journal of Innovative Technology and Exploring Engineering*, 8(11), 790–797. <https://doi.org/10.35940/ijitec.k1467.0981119>
- Hassard, J., Teoh, K., Cox, T., Dewe, P., Cosmar, M., Gründler, R., Flemming, D., Cosmar, M., & Broek, K. (2014). Calculating the cost of work-related stress and psychosocial risks - European Risk Observatory: A literature review. European Agency for Safety and Health at Work. Luxembourg: European Agency for Safety and Health at Work – EU-OSHA. doi : 10.2802/20493
- Hassard, J., Teoh, K. R., Visockaite, G., Dewe, P., & Cox, T. (2018). The cost of work-related stress to society: A systematic review. *Journal of occupational health psychology*, 23(1), 1.
- Hansson, G. A., Balogh, I., Ohlsson, K., Granqvist, L., Nordander, C., Arvidsson, I., ... & Skerfving, S. (2010). Physical workload in various types of work: Part II. Neck, shoulder and upper arm. *International Journal of Industrial Ergonomics*, 40(3), 267-281.
- Health and Safety Authority (HAS). (2017). Container Terminal - Stress. Retrieved from <https://www.hsa.ie>
- Health and Safety Executive (HSE). 2014. Risk Assessment: A brief guide to controlling risks in the workplace. Retrieved from <http://www.hse.gov.uk>
- Health and Safety Executive (HSE). (2018). Work Related Stress. Retrieved from <http://www.hse.gov.uk>
- Health and Safety Executive (2003). Real Solutions, Real People: A Managers’ Guide to Tackling Work-related Stress. Sudbury: HSE Books
- Helen Lingard & Michelle Turner (2017). Promoting construction workers’ health: a multi-level system perspective. *Construction Management and Economics*. 35(5). 239-253. <https://doi.org/10.1080/01446193.2016.1274828>.
- Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British journal of clinical psychology*, 44(2). 227-239.

- Ho, V., (2010). The risk of using risk matrix in assessing safety risk. In Technical Seminar, Joint Seminar of HKARMS, HKIE-MMNC, CILTHK, and IMechE, Hong Kong, November (16).
- Hoffmann, J., (2018). Review of Maritime Transport 2018. United Nations Conference on Trade and Development (UNCTAD). United Nations Publications. United States: USA
- Hogue, T. E. & Harper, C. A., (2014). The emotional representation of sexual crime in the national British press. *Journal of Language and Social Psychology*, 1(22), 1-22. doi: 10.1177/0261927X14544474
- Hossein Khanzadeh, A. A., Mousavi, S. V., Ramezani, M., Salehi, I., & Sheikholeslami, F. (2017). The relationship between burnout dimensions and psychological symptoms (depression, anxiety and stress) among nurses. *Journal of Holistic Nursing And Midwifery*, 27(2), 37-43.
- Hoy, D., Brooks, P., Woolf, A., Blyth, F., March, L., Bain, C., Baker, P., Smith, E., Buchbinder, R. (2012). Assessing risk of bias in prevalence studies: modification of an existing tool and evidence of interrater agreement. *Journal of Clinical Epidemiology*. 65(9). 934–939.
- Hubbard, D., & Evans, D. (2010). Problems with scoring methods and ordinal scales in risk assessment. *IBM Journal of Research and Development*. 54(3). 1–2.
- Hubbard, D. W., & Seiersen, R. (2016). Risk Matrices, Lie Factors, Misconceptions, and Other Obstacles to Measuring risk. In *How to Measure Anything in Cybersecurity Risk* (pp. 1–304). <https://doi.org/10.1002/9781119162315>
- Huber, W. & Cox, L. (2008). Optimal design of qualitative risk matrices to classify quantitative risks. In Proceedings of the Annual Meeting of the Society of Risk Analysis, Boston, MA.
- Hurrell, J., & McInaney, M., (1988). NIOSH Generic Job Stress Questionnaire: Exposure to job stress - A new psychometric instrument. *Scandinavian Journal Work Environmental Health*. 14(1). 27-28
- Hus, C., (2014). Risk Management on Safety and Health Performance in Infineon Technologies (Malaysia). Universiti Teknikal Malaysia Melaka.
- Iavicoli, S., Natali, E., Deitingner, P., Rondinone, B., Ertel, M., Jain, A., & Leka, S. (2011). Occupational health and safety policy and psychosocial risks in Europe: The role of stakeholders' perceptions. *Journal of Health Policy*. 101(1). 87–94. doi : 10.1016/2010.08.005
- Ibrahim, H. I. (2014). The relationship between job stress, co-worker support and organization-based self-esteem: a survey across different occupations. *Researchers World*, 5(2), 69.
- IEC. ISO 31010. (2009). Section 11 - Risk management. Risk assessment techniques, p.4
- Idris, M. A., & Dollard, M. F. (2014). Psychosocial safety climate, emotional demands, burnout, and depression: A longitudinal multilevel study in the Malaysian private sector. *Journal of occupational health psychology*, 19(3), 291.

- Institute Occupational Safety and Health (IOSH). (2016). Global container terminals: arrangements for health, safety and welfare. IOSH. 1–11. Retrieved from www.iosh.co.uk
- Irawanto, D. W., Noermiyati, & Primasari, D. (2015). The effect of occupational stress on work performance of female employees: Study in Indonesia. *Asia-Pacific Journal of Management Research and Innovation*, 11(4), 336-345.
- Ikpe, E., Hammon, F., & Oloke, D. (2012). Cost-benefit analysis for accident prevention in construction projects. *Journal of Construction Engineering and Management*. 138(8). 991–998.
- International Organization for Standardization [ISO]. (2009a). Risk Management - Principles and Guidelines (ISO 31000). Retrieve from <https://www.iso.org/obp/ui/#iso:std:iso:31000:ed-1:v1:en>
- International Organization for Standardization (ISO). (2018). ISO 9000 family: Quality Management. Risk Management and Opportunity. Retrieved from <https://www.iso.org>
- International Labour Organization (ILO). (2016). A Collective Challenge World Day for Safety and Health at Work. Cambridge University Press, 1–30.
- Islam, J., Mohajan, H., & Datta, R. (2012). Stress management policy analysis: a preventative approach. *International Journal of Economics and Research*. 3(6). 1-17
- Ismail, A. R., Hamzah, N. A., Makhtar, N. K., Hassan, N. H. C., Mohamad, D., & Deros, B. M. (2017). A Study of Road Hazards Faced by Malaysian School Children Using HIRARC. *Malaysian Journal of Public Health Medicine*, 2(2), 10–17. <https://doi.org/10.1088/1361-6595/26/2/024002>
- Ismail, N. S., & Rasdi, I. (2019). HIRARC for the Use of Calcium Carbide (Cac2) as Ripening Agent Among Mango Farmers in Northern Region of Malaysia. *International Journal of Agriculture, Forestry and Plantation*, 8, 31–35. Retrieved from http://ijafp.com/wp-content/uploads/2019/09/KLIAFP8_025.pdf
- Jaafar, M., Arifin, K., Aiyub, K., Razman, M., & Ahmad, M. (2016). A review of occupational safety and health (OSH) accidents and contributing factors in construction industry. *Journal of Food, Agriculture and Environment*. 13(2). 238-244.
- Jamadin, N., Mohamad, S., Syarkawi, Z., & Noordin, F. (2015). Work-family conflict and stress: Evidence from Malaysia. *Journal of Economics, Business and Management*. 3(2). 309–312.
- Jamaludin, M. I., Dahlan, N. ., Elias, S. M., & Baharudin, M. R. (2017). Plantation Safety: A Conceptual Paper on Factors that Affect Safety and Health Risk Assessment in Oil Palm Plantation. *Journal of Occupational Safety and Health*, 14(2), 33–37. Retrieved from <http://www.niosh.com.my/images/URL/CONTENT-JOSH-DEC-2017-B5-ALL.pdf>

- Johari, J., Ramli, F. Z. A., Wahab, H. A., Bidin, M. F., & Rosely, R. M. (2019). Social support, pay satisfaction, work ability, and intention to stay: A case of return to work program participants. *Jurnal Pengurusan*
- Jeevan, J., Ghaderi, H., Bandara, Y., Saharuddin, A., & Othman, M. (2015). The implications of the growth of port throughput on the port capacity: the case of Malaysian major container seaports. *International Journal of E-Navigation and Maritime Economy*, 3. 84–98.
- Jeevan, J., Chen, S., & Lee S. (2015). The challenges of Malaysian dry ports development. *The Asian Journal of Shipping and Logistics*, 31(1). 109-134
- Jespersen, A. H., Hasle, P., & Nielsen, K. T. (2016). The wicked character of psychosocial risks: implications for regulation. *Nordic Journal of Working Life Studies*, 6(3). 23–42. doi: 10.19154/3.5526
- Jiang, Z., Fang, D., & Zhang, M. (2014). Understanding the Causation of Construction Workers' Unsafe Behaviors Based on System Dynamics Modeling. *Journal of Management in Engineering*, 31(6), 04014099. [https://doi.org/10.1061/\(asce\)me.1943-5479.0000350](https://doi.org/10.1061/(asce)me.1943-5479.0000350)
- Jimenez, P., & Dunkl, A. (2017). Assessment of Psychosocial Risks and Mental Stress at Work: The Development of the Instrument OrgFit. *Journal of Ergonomics*, 7(1). 188. doi: 10.4182/2165-7556.1000188
- Jin, W., (2020). Occupational Stress and Risk Factors Among Workers from Electronic Manufacturing Service Companies in China. *China CDC Weekly*, 2(9).
- Joseph, D., Jin, J., Newman, D., & O'boyle, E. (2015). Why does self-reported emotional intelligence predict job performance? A meta-analytic investigation of mixed EI. *Journal of Applied Psychology*, 100(2). 298.
- Kadir, Z. A., Mohammad, R., Othman, N., Amrin, A., Muhtazaruddin, M. N., Abu-Bakar, S. H., & Muham, F. (2020). Risk management framework for handling and storage of cargo at major ports in Malaysia towards port sustainability. *Sustainability (Switzerland)*, 12(2). <https://doi.org/10.3390/su12020516>
- Kamar, I., & Ahmad, A. (2016). A Conceptual Framework of Safety and Health in Construction Management. In *MATEC Web of Conferences* (Vol. 66, p. 107). EDP Sciences.
- Karasek, R. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 285–308.
- Karasek, R. (1985). *Job content questionnaire*. Los Angeles: University of Southern California.
- Karasek, R. A., Theorell, T., & Eneroth, P. (1990). Job strain variations in relation to plasma testosterone fluctuations in working men in a longitudinal study. *Journal of internal medicine*, 227(1). 31-36.
- Karimi, S., Andayeshgar, B. & Khatony, A. Prevalence of anxiety, depression, and stress in patients with multiple sclerosis in Kermanshah-Iran: a cross-sectional study. *BMC Psychiatry* 20, 166 (2020). <https://doi.org/10.1186/s12888-020-02579-z>

- Kashwani, G., & Nielsen, Y. (2017). Evaluation of safety engineering system in oil and gas construction projects in UAE. *International Journal of geomate*. 12(29). 178–185.
- Kaewboonchoo, O., Yingyuad, B., Rawiworrakul, T., & Jinayon, A. (2014). Job stress and intent to stay at work among registered female nurses working in Thai hospitals. *Journal of Occupational Health*, 56(2), 93-99.
- Ke, D. S. (2012). Overwork, stroke, and karoshi-death from overwork. *Acta Neurologica Taiwan*, 21(2), 54-9.
- Kemei, R., & Julius Nyerere. (2016). Occupational Accident Patterns and Prevention Measures in Construction Sites in Nairobi County Kenya. *American Journal of Civil Engineering*, 4(5), 254–263. <https://doi.org/10.11648/j.ajce.20160405.17>
- Kennedy, N. A. (2018). Assessment of Psychosocial Hazards among Workers at the University of Port Harcourt. *Journal of Clinical Depression*. 4(3). doi: 0.4172/2572-0791.1000135
- Khamisa, N., Oldenburg, B., Peltzer, K., & Ilic, D. (2015). Work related stress, burnout, job satisfaction and general health of nurses. *International Journal Of Environmental Research And Public Health*, 12(1). 652-666.
- Khashaba, E. O., El-Sherif, M. A. F., Ibrahim, A. A. W., & Neatmatallah, M. A. (2014). Work-related psychosocial hazards among emergency medical responders (EMRS) in Mansoura city. *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine*, 39(2), 103.
- Kivimaki, M., & Kawachi, I. (2015). Work stress as a risk factor for cardiovascular disease. *Current cardiology reports*, 17(9), 1-9.
- Kivimaki, M., Nyberg, S. T., Fransson, E. I., Heikkilä, K., Alfredsson, L., Casini, A., & Batty, G. D. (2013). Associations of job strain and lifestyle risk factors with risk of coronary artery disease: a meta-analysis of individual participant data. *Cmaj*, 185(9), 763-769.
- Knaak, S., Mantler, E., & Szeto, A. (2017). Mental illness-related stigma in healthcare: Barriers to access and care and evidence-based solutions. In *Healthcare management forum*. 30. 111–116. SAGE Publications Sage Los Angeles, CA.
- Kopp, M., Thege, B., Balog, P., Stauder, A., Salavec, G., Rozsa, S., Purebl, G., & Adam, S. (2010). Measures of stress in epidemiological research. *Journal of Psychosomatic Research*. 69(2). 211–225. doi : 10.1016/2009.09.006
- Kobayashi, Y., & Kondo, N., (2019). Organizational justice, psychological distress, and stress-related behaviours by occupational class in female Japanese employees. *Plos One*. 14(4). 1-13. doi :10.1371/.0214393
- Kortum, E., Leka, S., & Cox, T. (2011). Psychosocial risks and work-related stress in developing countries: health impact, priorities, barriers and solutions. *International journal of occupational medicine and environmental health*, 23(3), 225-238.
- Kuang, L., Hassan, H., & Zainudin, N. (2010). Towards Zero Accidents in Construction Projects : Promoting HIRARC As An Effective Tool To Reduce Accidents.

- International Graduate Conference on Engineering, Science and Humanities. (November). 3–5.
- Kumar, T., & Pragadeeswaran, S. (2011). Effects of occupational stress on spiritual quotient among executives. *International Journal of Trade, Economics and Finance*, 2(4), 288.
- Kutty, N. A. M., Jabbar, M. A. R., & Cheng, K. C. (2019). Association of Occupational Stress and Emotional Intelligence among Physiotherapists in Malaysia: A Cross-sectional Study. *Disability, CBR & Inclusive Development*, 30(4), 77-95.
- Lai, K., & Green, S. B. (2016). The problem with having two watches: Assessment of fit when RMSEA and CFI disagree. *Multivariate behavioral research*, 51(2-3), 220-239.
- Lambert, E., Minor, K., Wells, J., & Hogan, N. (2016). Social support's relationship to correctional staff job stress, job involvement, job satisfaction, and organizational commitment. *The Social Science Journal*, 53(1), 22-32.
- Lambert, R., Boyle, L., Fitchett, P., & McCarthy, C. (2019). Risk for occupational stress among US kindergarten teachers. *Journal of Applied Developmental Psychology*, 61, 13-20.
- Lalonde, C., & Boiral, O. (2012). Managing risks through ISO 31000: A critical analysis. *Risk Management*, 14(4), 272–300.
- Lazarus, R. S. (1966). *Psychological stress and the coping process*. New York: McGraw Hill.
- Lazarus, R. (2006). *Stress and emotion. A new synthesis*. New York: Springer.
- Lee, Y., Gill, H., Kang, S., Rosenblat, J. D., Brietzke, E., Zuckerman, H., & McIntyre, R. S. (2019). The long-term effect of bariatric surgery on depression and anxiety. *Journal of affective disorders*, 246, 886-894.
- Lee Lam Thye (2019) Mental health in the workplace. National Institute of Occupational Safety and Health (NIOSH). <https://www.thestar.com.my/opinion/letters/2019/07/15/mental-health-in-the-workplace>.
- Leech, N. L., Barrett, K. C., & Morgan, G. A. (2014). *IBM SPSS for intermediate statistics: Use and interpretation*. Routledge.
- Leineweber, C., Marklund, S., Aronsson, G., & Gustafsson, K. (2019). Work-related psychosocial risk factors and risk of disability pension among employees in health and personal care-a prospective cohort study. *International Journal of Nursing Studies*, 93, 12-20. doi : 10.1016/2018.10.009
- Leka, S., Jain, A., Iavicoli, S., & Di Tecco, C. (2015). An evaluation of the policy context on psychosocial risks and mental health in the workplace in the European Union: achievements, challenges, and the future. *BioMed Research International*, 1(18). doi : 10.1155/2015/213089
- Leka, S., Jain, A., Iavicoli, S., Vartia, M., & Ertel, M. (2011). The role of policy for the management of psychosocial risks at the workplace in the European Union. *Journal of Safety Science*, 49(4), 558–564. doi : 10.1016/2010.02.002

- Leka, S., & Jain, A., (2010). Health impact of psychosocial hazards at work: an overview. In World Health Organization (WHO) Handbook. Geneva. Switzerland. WHO Press. ISBN 978 92 4 150027 2
- Leka, S., & Jain, A. (2013). Psychosocial risks: is risk management strategic enough in business and policy making?. *Safety and health at work*, 4(2), 87-94.
- Leung, M., Liang, Q., & Olomolaiye, P. (2015). Impact of job stressors and stress on the safety behavior and accidents of construction workers. *Journal of Management in Engineering*. 32(1). doi : 10.1061/1943-5479.0000373
- Leveson, N. G. (2019). Improving the Standard Risk Matrix : Part 1. *STAMP Workshop*, (February), 1–14. Retrieved from http://psas.scripts.mit.edu/home/wp-content/uploads/2019/04/WedMorning_Leveson_Improving-the-Risk-Matrix.pdf
- Li, J., Dollard, M., Loerbroks, A., & Angerer, P. (2015). Cardiovascular disease is associated with the perception of worsening psychosocial work characteristics. *International Journal of Cardiology*, 186. 149–151.
- Liang, K., Fung, I. W. H., Xiong, C., & Luo, H. (2019). Understanding the factors and the corresponding interactions that influence construction worker safety performance from a competency-model-based perspective: evidence from scaffolders in China. *International journal of environmental research and public health*, 16(11), 1885.
- Liu, X., Zheng, J., Liu, K., Baggs, J. G., Liu, J., Wu, Y., & You, L. (2018). Hospital nursing organizational factors, nursing care left undone, and nurse burnout as predictors of patient safety: A structural equation modeling analysis. *International journal of nursing studies*, 86, 82-89.
- Lotfizadeh, M., Moazen, B., Habibi, E., & Hassim, N., (2013). Occupational stress among white collar employees in Esfahan steel company, Iran: Prevalence and Associated Factors. *International Journal of Preventive Medicine*, 4(7). 803-808
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour research and therapy*. 33(3),335-343.
- Low, Z. X., Yeo, K. A., Sharma, V. K., Leung, G. K., McIntyre, R. S., Guerrero, A., & Ho, R. C. (2019). Prevalence of burnout in medical and surgical residents: a meta-analysis. *International Journal Of Environmental Research And Public Health*, 16(9), 1479.
- Lu, C., & Kuo, S. (2016). The effect of job stress on self-reported safety behaviour in container terminal operations: The moderating role of emotional intelligence. *Transportation Research Part F: Traffic Psychology and Behaviour*. 37. 10–26. doi: 10.1016/2015.12.008
- Lua, P., & Imilia, I. (2011). Work-related stress among healthcare providers of various sectors in peninsular malaysia. *Malaysian Journal of Psychiatry*. 20(2).

- Makhbul, Z., & Khairuddin, S. (2013). Stress among Malaysian Academics: a conceptual study. *International Journal of Academic Research in Business and Social Sciences*. 3(1). 196.
- Mahmood, A., & Yadav, L. K. (2017). Occupational Stress, Emotional Intelligence and Demography: A study among working professionals. *International Journal of Business Insights & Transformation*, 10(2).
- Malik, M.I., Safwan, M.N., Sindhu, A.G., (2011). Examining Stress, Job Satisfaction and Customer Satisfaction in a Transport Company-A Case from Pakistan. *Int J Bus Soc Sci*;2:81-5
- Mallow, M. S., (2016). Occupational Stress in Malaysia: Causes, Effects & Possible Solutions. Proceedings of SOCIOINT 2016 3rd International Conference on Education, Social Sciences and Humanities. 82-87.
- Maninder, S., (2016). Methodology series module 3: Cross-sectional studies. *Indian journal of dermatology*, 61(3), 261.
- Marcatto, F., Colautti, L., Filon, F., Luis, O., Di Blas, L., Cavallero, C., & Ferrante, D. (2016). Work-related stress risk factors and health outcomes in public sector employees. *Journal of Safety Science*. 89. 274–278.
- Marhavilas, P., Koulouriotis, D., Nikolaou, I., & Tsotoulidou, S., (2018). International Occupational Health and Safety Management-Systems Standards as a Frame for the Sustainability: Mapping the Territory. *Journal of Sustainability*. (10). 1-26. doi : 10.3390/10103663
- Marsh, H. W., Guo, J., Dicke, T., Parker, P. D., & Craven, R. G. (2020). Confirmatory factor analysis (CFA), exploratory structural equation modeling (ESEM), and set-ESEM: optimal balance between goodness of fit and parsimony. *Multivariate behavioral research*, 55(1), 102-119.
- Masilamani, R., Bulgiba, A., Chinna, K., Darus, A., Isahak, M., Kandiben, S., & Koh, D. (2013). Prevalence and associated factors of stress in the Malaysian Police Force. *Preventive Medicine*. 57.57–S59.
- Maslach, C., & Leiter, M. (2016). Burnout. In *Stress: Concepts, Cognition, Emotion, and Behavior*. 351–357. Elsevier.
- Matheus F & Oliveira B (2015) Occupational risk management in construction supply chain. *Int. J. Business Performance and Supply Chain Modelling*. 7(1).
- Mathangi, V., (2017). Impact of job stress on employees' job performance in Aavin, Coimbatore. *Journal of Organisation & Human Behaviour*, 6(3).
- McCarty, R. (2016). The alarm phase and the general adaptation syndrome: two aspects of Selye's inconsistent legacy. In *Stress: Concepts, Cognition, Emotion, and Behavior* (pp. 13-19). Academic Press.
- McGonagle, A. K., Fisher, G. G., Barnes-Farrell, J. L., & Grosch, J. W. (2015). Individual and work factors related to perceived work ability and labor force outcomes. *Journal of Applied Psychology*, 100(2), 376.
- McLinton, S., & Dollard, M. (2010). Work stress and driving anger in Japan. *Accident Analysis & Prevention*. 42(1). 174–181.

- Mehta, R. K., & Agnew, M. J. (2010). Analysis of individual and occupational risk factors on task performance and biomechanical demands for a simulated drilling task. *International Journal of Industrial Ergonomics*, 40(5), 584-591.
- Metzler, Y., & Bellingrath, S. (2018). Psychosocial Hazard Analysis in a Heterogeneous Workforce: Determinants of Work Stress in Blue- and White-Collar Workers of the European Steel Industry. *Frontier in public Health*. 5(210). 1-13. doi: 10.3389/2017.00210
- Milczarek, M., Irastorza, X., (2012). Drivers and barriers for psychosocial risk management: an analysis of the findings of the European Survey of Enterprises on New and Emerging Risks (ESENER) Report. European Union European Agency for Safety and health at Work (EU-OSHA). Luxembourg. ISSN 1831-9343
- Ministry of Transport (MOT). (2018). Transport Statistics Malaysia 2017. Total Cargo Throughput by Ports, Malaysia, 2008-2017. 36-51. ISSN: 0128-2778
- MMC Corporation Berhad. (2018). Port and Logistics. Staying Ahead: Annual Report 2017. 29-31.
- Mallow, M. S. (2016). Occupational stress in Malaysia: Causes, effects & possible solutions. In Socioint16: 3rd International Conference On Social Sciences And Humanities. INT Organization Center Acad Research.
- Mohajan, H. (2012). The occupational stress and risk of it among the employees. *International Journal of Mainstream Social Science*. 2(2). 17–34.
- Moncada, S., Utzet, M., Molinero, E., Llorens, C., Moreno, N., Galtés, A., & Navarro, A. (2014). The copenhagen psychosocial questionnaire II (COPSOQ II) in Spain—A tool for psychosocial risk assessment at the workplace. *American journal of industrial medicine*, 57(1), 97-107.
- Mohamad, M., Afthanorhan, A., Awang, Z., & Mohammad, M. (2019). Comparison between CB-SEM and PLS-SEM: Testing and confirming the maqasid syariah quality of life measurement model. *The Journal of Social Sciences Research*, 5(3), 608-614.
- Mohammed, F. (2019, March 23). Work-related stress: Are you a victim? Free Malaysia Today News. Retrieved from <https://www.freemalaysiatoday.com>
- Mohd Zukri, I., & Noor Hashim, I., (2010). A study of occupational stress and coping strategies among correctional officers in Kedah, Malaysia. *Journal of Community Health*. 16(2). 66-74.
- Morke M., Mulat G., and Destaw F., (2018). Work related stress and associated factors among Huajian shoe manufacturing employees in Dukem town, central Ethiopia. *BMC Research Notes*, 11(610).
- Mucci, N., Giorgi, G., Cupelli, V., Giofrè, P., Rosati, M., Tomei, F., Gianfrabco, T., Esteve, E., & Arcangeli, G. (2015). Work-related stress assessment in a population of Italian workers. The Stress Questionnaire. *Science of the Total Environment*. 502. 673–679. doi : 10.1016/2014.09.069

- Mueller, R. O., & Hancock, G. R. (2019). *Structural equation modeling*. Routledge/Taylor & Francis Group.
- Mulugeta, H., Tamene, A., Ashenafi, T., Thygerson, S. M., & Baxter, N. D. (2021). Workplace stress and associated factors among vehicle repair workers in Hawassa City, Southern Ethiopia. *PloS one*, 16(4).
- Musa, R., Fadzil, M., & Zain, Z. (2007). Translation, validation and psychometric properties of Bahasa Malaysia version of the Depression Anxiety and Stress Scales (DASS). *ASEAN Journal of Psychiatry*. 8(2). 82-9.
- Musa, R., Saidi, S., Jaafar, S. N. I., Daud, A., & Ahmad, N. N. F. N. (2018). Relationship between levels of thyroid stimulating hormone, age, and gender, with symptoms of depression among patients with thyroid disorders as measured by the Depression Anxiety Stress Scale 21 (DASS-21). *Enfermeria clinica*, 28, 180-183.
- Musa, R., Ramli, R., Abdullah, K., & Sarkarsi, R. (2011). Concurrent validity of the depression and anxiety components in the Bahasa Malaysia version of the Depression Anxiety and Stress scales (DASS). *Malay*. 230. 93-5.
- Murni, J., Nizam, D., Saliza, E., & Rafee, B., (2017). Plantation safety: A Conceptual paper on factors that affect safety and health risk assessment in oil palm plantation. *Journal of Occupational Safety and Health*. 14(2). 33-37.
- Mustafa, M., Illzam, E., Muniandy, R., Hashmi, M., Sharifa, A., & Nang, M. (2015) Causes and Prevention of Occupational Stress. *IOSR Journal of Dental and Medical Sciences* 14(11). 98-104
- Muthiah, W. (2018). Stress and workplace depression must be addressed, says mental health association. *The Star Online*. Retrieved from <https://www.thestar.com.my>
- Nabirye, R., Brown, K., (2011). Occupational stress, job satisfaction and job performance among hospital nurses in Kampala, Uganda. *J Nurs Mgt*, 19:760-768.
- Nordin, R. Hadi, A., Naing, N., & Daud, A., (2006). Reliability and construct validity of the Malay version of the Job Content Questionnaire (JCQ) among secondary school teachers in Kota Bharu, Kelantan, Malaysia. *Southeast Asian Journal of Tropical Medicine and Public Health*. 37(6). 1254.
- Ni, H., Chen, A., & Chen, N. (2010). Some extensions on risk matrix approach. *Safety Science*. 48(10). 1269–1278.
- Nunnally, J. C. (1994). *Psychometric theory 3E*: Tata McGraw-Hill Education
- Oei, T. P., Sawang, S., Goh, Y. W., & Mukhtar, F. (2013). Using the depression anxiety stress scale 21 (DASS-21) across cultures. *International Journal of Psychology*, 48(6), 1018-1029
- Occupational Safety and Health Administration. (2017). Recommended practices for safety and health programs. Hazard Identification and Assessment. Department of Labor: United States. Retrieved from www.osha.gov
- Occupational Safety and Health Act (OSHA). (1994) (KL)(Mal.). Retrieved from <https://www.dosh.gov.my/index.php/legislation/acts-legislation/23-02-occupational-safety-and-health-act-1994-act-514/file>

- Oliveira, M., Bana, C., & Lopes, F. (2018). Designing and exploring risk matrices with MACBETH. *International Journal of Information Technology & Decision Making*. 17(01). 45-81. DOI: 10.1142/S0219622015500170.
- Oluoch, I., Njogu, P., & Ndeda, J. O. H. (2017). Effects of Occupational Safety and Health Hazards' Exposure on Work Environment in the Water Service Industry within Kisumu County - Kenya. *Journal of Environmental Science, Toxicology and Food Technology*. 11(05).46–51. doi: 10.9790/2402-1105014651
- Osipow, H. (1998). Occupational Stress Inventory-Revised Edition (OSI-R). Professional Manual. USA- Psychological Assessment Resources, Inc
- Osman, A., Wong, J. L., Bagge, C. L., Freedenthal, S., Gutierrez, P. M., & Lozano, G. (2012). The depression anxiety stress Scales—21 (DASS-21): further examination of dimensions, scale reliability, and correlates. *Journal of clinical psychology*, 68(12), 1322-1338.
- Othman, C., Lamin, R., & Othman, N., (2014). Occupational Stress Index of Malaysian University Workplace. *Procedia - Social and Behavioral Sciences*. In AMER International Conference on Quality of Life. 153. 700–710. doi: 10.1016/2014.10.101
- Pallis, P. (2017). Port Risk Management in Container Terminals. *Transportation Research Procedia*. 25. 4411–4421. doi : 10.1016/2017.05.337
- Pacaiova, H. & Balazikova, M. (2010). Assessment of Psychosocial Risks at Work Daaam International Scientific Book. 347-356
- Panda, K., & Philippe, M., (2015). Occupational Stress among Textile Workers in the Democratic Republic of Congo. *Tropical Medicine and Health*. 43(4). p. 223–231.
- Park, B.C., Cheong, H.K., Kim, E.A., Kim, S.G., (2010). Risk factors of work-related upper extremity work-related musculoskeletal disorders in male shipyard workers: structural equation model analysis, *Saf Health Work*, 1(2) p. 124-133.
- Parker, S., Morgeson, F., & Johns, G. (2017). One hundred years of work design research: Looking back and looking forward. *Journal of applied psychology*, 102(3). 403.
- Pauksztat, B. (2017). 'Only work and sleep': seafarers' perceptions of job demands of short sea cargo shipping lines and their effects on work and life on board. *Maritime Policy & Management*, 44(7), 899-915.
- Penang Port. (2018). Services. Retrieved from www.penangport.com.my.
- Peng, Y. N., Huang, M. L., & Kao, C. H. (2019). Prevalence of depression and anxiety in colorectal cancer patients: a literature review. *International journal of environmental research and public health*, 16(3), 411.
- Persechino, B., Valenti, A., Ronchetti, M., Rondinone, B., Di Tecco, C., Vitali, S., & Iavicoli, S. (2013). Work-related stress risk assessment in Italy: a methodological proposal adapted to regulatory guidelines. *Safety and Health at Work*. 4(2). 95–99.
- Presser, S., & Blair, J. (1994). Survey pretesting: Do different methods produce different results? *Sociological methodology*, 73-104. <https://doi.org/10.2307/270979>

- Presser, S., Couper, M. P., Lessler, J. T., Martin, E., Martin, J., Rothgeb, J. M., & Singer, E. (2004). Methods for testing and evaluating survey questions. *Public opinion quarterly*, 68(1), 109-130. <https://doi.org/10.1093/poq/nfh008>
- Peternel, K., Pogačnik, M., Tavčar, R., & Kos, A.,. (2012). A presence-based context-aware chronic stress recognition system. *Sensors Basel*, 12(11), 15888–15906. doi : 10.3390/121115888
- Pickering, A., & Cowley, S., (2010). Risk Matrices: implied accuracy and false assumptions. *Journal of Health & Safety Research & Practice*. 2(1). 9-16.
- Pinto, A., Nunes, I., & Ribeiro, R. (2011). Occupational risk assessment in construction industry—Overview and reflection. *Safety Science*. 49(5). 616–624.
- Polit, D., Beck, C., & Owen, S. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health*. 30(4). 459–467.
- Pacific Maritime Association (PMA). (2012). Economic Impact and Competitiveness of the West Coast Ports and Factors that Could Threaten Growth. <https://www.pmanet.org/west-coast-ports/>
- Plieger, T., Felten, A., Diks, E., Tepel, J., Mies, M., & Reuter, M. (2017). The impact of acute stress on cognitive functioning: a matter of cognitive demands?. *Cognitive neuropsychiatry*, 22(1), 69-82.
- Potter, R., Dollard, M., Owen, M., O’Keeffe, V., Bailey, T., & Leka, S. (2017). Assessing a national work health and safety policy intervention using the psychosocial safety climate framework. *Safety Science*. 100. 91–102.
- Potter, R., O’Keeffe, V., Leka, S., Webber, M., & Dollard, M. (2019). Analytical review of the Australian policy context for work-related psychological health and psychosocial risks. *Safety Science*. 111. 37–48. doi : 10.1016/2018.09.012
- Peeters, W., & Peng, Z. (2015). An Approach Towards Global Standardization of the Risk Matrix. *Journal of Space Safety Engineering*, 2(1), 31–38. [https://doi.org/10.1016/S2468-8967\(16\)30037-4](https://doi.org/10.1016/S2468-8967(16)30037-4)
- Prajogo, D., & Cooper, B. (2010). The effect of people-related TQM practices on job satisfaction: a hierarchical model. *Production Planning and Control*. 21(1). 26-35.
- Priyadarshani, K., Karunasena, G., & Jayasuriya, S. (2013). Construction safety assessment framework for developing countries: a case study of Sri Lanka. *Journal of Construction in Developing Countries*. 18(1). 33-51.
- Pryor, W., (2012). Bio-assays for oxidative stress status (BOSS). Amsterdam: Netherlands. Elsevier.
- Pryor, M. & Capra, P. (2012) Foundation Science. In HaSPA (Health and Safety Professionals Alliance). The Core Body of Knowledge for Generalist OHS Professionals. Tullamarine, VIC. Safety Institute of Australia
- Purdy, G. (2010). ISO 31000: 2009 - setting a new standard for risk management. *Risk Analysis: An International Journal*. 30(6). 881–886.

- Quick, J. C., & Henderson, D. F. (2016). Occupational stress: Preventing suffering, enhancing wellbeing. *International journal of environmental research and public health*, 13(5), 459.
- Rahe, R., & Tolles, R., (2009). The Brief Stress and Coping Inventory: A Useful Stress Management Instrument. *International Journal of Stress Management*. 9(2). 61-70.
- Rahi, S., & Abd Ghani, M. (2018). A structural equation modeling (SEM-AMOS) for investigating brand loyalty and customer's intention towards adoption of internet banking. *Economic and Social Development: Book of Proceedings*, 206-220.
- Rahlin, N. A., Awang, Z., Afthanorhan, A., & Aimran, N. (2019). The art of covariance based analysis in behaviour-based safety performance study using confirmatory factor analysis: Evidence from SMES. *International Journal of Innovation, Creativity and Change*, 7(10), 351-370.
- Rahmatdin, N., Rahman, Abdul Rahman, S., & Othman, K. (2017). An Empirical Study on the Current Feeder Shipping Network Patterns among Malaysian Feeder Service Providers. *The Asian Journal of Shipping and Logistics*. 33(4). 177–188. doi: 10.1016/2017.12.001
- Rahman, H. A., Abdul-Mumin, K., & Naing, L. (2017). Psychosocial factors, musculoskeletal disorders and work-related fatigue amongst nurses in Brunei: structural equation model approach. *International emergency nursing*, 34, 17-22.
- Rajbhandari, L., & Sneekenes, E., (2011). An approach to measure effectiveness of control for risk analysis with game theory. In *Socio-Technical Aspects in Security and Trust (STAST).1st Workshop*. 24–29. IEEE.
- Ramón-Arbués, E., Gea-Caballero, V., Granada-López, J. M., Juárez-Vela, R., Pellicer-García, B., & Antón-Solanas, I. (2020). The prevalence of depression, anxiety and stress and their associated factors in college students. *International Journal of Environmental Research and Public Health*, 17(19), 7001.
- Rashid, I., & Talib, P. (2015). Occupational stress and coping styles among doctors: role of demographic and environment variables. *Vision*, 19(3), 263-275.
- Razak, M. I., Yusof, N. M., Azidin, R. A., Latif, M. M. R. H. A., & Ismail, I. (2014). The impact of work stress towards work life balance in Malaysia. *International Journal of economics, commerce and management*, 2(11), 1-16.
- Reyes, J. P., San-José, J. T., Cuadrado, J., & Sancibrian, R. (2014). Health & Safety criteria for determining the sustainable value of construction projects. *Safety Science*, 62, 221–232. <https://doi.org/10.1016/j.ssci.2013.08.023>
- Riedl, A., Kainz, W., & Elmes, G. A. (2006). Progress in Spatial Data Handling: 12th International Symposium on Spatial Data Handling: *Springer Science & Business Media*. <https://doi.org/10.1007/3-540-35589-8>
- Riggle, E., Rostosky, S., & Horne, S., (2010). Psychological Distress, Well-Being, and Legal Recognition in Same-Sex Couple Relationships. *Journal of Family Psychology* 24(1):82- 24(1). 6-82. doi : 10.1037/0017942

- Rodrigues, M., Arezes, P., & Leao, C. (2015). Defining risk acceptance criteria in occupational settings: A case study in the furniture industrial sector. *Journal of Safety Science*, 80, 288–295.
- Rodriguez, F. S., Spilski, J., Hekele, F., Beese, N. O., & Lachmann, T. (2019). Physical and cognitive demands of work in building construction. *Engineering, Construction and Architectural Management*.
- Roelen, A., van Aalst, R., Karanikas, N., Kaspers, S., Piric, S., & de Boer, R. J. (2018). Effectiveness of risk controls as indicator of safety performance. *AUP Advances*, 1(1), 175–189. <https://doi.org/10.5117/adv2018.1.roel>
- Roquelaure, Y., Garlantézec, R., Evanoff, B. A., Descatha, A., Fassier, J. B., & Bodin, J. (2020). Personal, biomechanical, psychosocial, and organizational risk factors for carpal tunnel syndrome: a structural equation modeling approach. *Pain*, 161(4), 749-757
- Rosa, L. V., Haddad, A. N., & de Carvalho, P. V. R. (2015). Assessing risk in sustainable construction using the Functional Resonance Analysis Method (FRAM). *Cognition, Technology & Work*, 17(4), 559-573.
- Rout, B., & Sikdar, B. (2017). Hazard Identification, Risk Assessment, and Control Measures as an Effective Tool of Occupational Health Assessment of Hazardous Process in an Iron Ore Pelletizing Industry. *Indian Journal of Occupational Environment Medical*, 21(2). 56–76. doi: 10.4103/1916
- Ruitenburg, M.M., Frings-Dresen, M.H., Sluiter, J.K., (2012). The prevalence of common mental disorders among hospital physicians and their association with self-reported workability: a cross-sectional study. *BMC Health Services Research*, 12(1):292.
- Rusli, N., Azlihanis, N., Nyi Nyi, N., & Aziah, D., (2006). Reliability and construct validity of the Malay version of the Job Content Questionnaire (JCQ) among secondary school teachers in Kota Bharu, Kelantan, Malaysia. *Southeast Asian Journal of Tropical Medicine And Public Health*. 37(6). 1254
- Safaria, T., Othman, A. and Wahab, MNA. (2011) Gender, Academic rank, Employment status, University type and Occupational stress among University Academic staff: a Comparison between Malaysia and Indonesia context. *International Journal of Humanities and Social Science*, 1(18).
- Sarkam, S. F., Shaharuddin, L. S., Zaki, B. M., Masdek, N. R. N. M., Yaacob, N. J. A., & Mustapha, M. (2018). Factors Influencing Safety Performance at the Construction Site. *International Journal of Academic Research in Business and Social Sciences*, 8(9), 1057–1068. <https://doi.org/10.6007/ijarbss/v8-i9/4680>
- Sang-Ryul, S. & ShuoXiong, Z., (2018). A Statistical Analysis on the Effect of Korea-China FTA in Immediate Tariffs Abolition Items of Agricultural Products. 117-122.
- Santos, K. O. B., Carvalho, F. M., & de Araújo, T. M. (2016). Factor structure and validity indicators of the job content questionnaire: Discussing stress in the work contexts. *Psychology*, 7(12), 1424-1437.

- Sanz, J. H., Wang, J., Berl, M. M., Armour, A. C., Cheng, Y. I., & Donofrio, M. T. (2018). Executive function and psychosocial quality of life in school age children with congenital heart disease. *The Journal of pediatrics*, 202, 63-69
- Standard Australia (SA/SNZ). (2013). Risk Management guidelines: Companion to AS/NZS ISO 31000:2009. Sydney: NSW. SAI Global Limited.
- Safe Work Australia. (2018). Work-related psychological health and safety: A systematic approach to meeting your duties. Canberra, Australia: Safe Work Australia.
- Safety Health Executive (SHE). (2017). Example risk assessment: Work-related stress in a small business. Retrieved from <http://www.hse.gov.uk>
- Satishkumar, C. S., & Shrihari, S. (2016). Standardisation of Risk Assessment Process By Modifying the Risk Matrix. *International Journal of Advance Research in Science and Engineering*, 5(1), 148–158. Retrieved from https://www.ijarse.com/images/fullpdf/1455639281_302S.pdf
- Schmidt, M. (2016). Making sense of risk tolerance criteria. *Journal of Loss Prevention in the Process Industries*. 41. 344–354.
- Schaupp, L., Carter, L., & McBride, M. (2010). E-file adoption: A study of US taxpayers' intentions. *Computer in Human Behavior*. 26(4). 636-644.
- Schnall, P., Dobson, M., Rosskam, E., & Elling, R. (2017). Unhealthy work: Causes, consequences, cures. New York: Routledge. Retrieved from <https://www.crcpress.com>
- Sharifah, Z.S.Y., Afiq, I.M., Siti, S.D., (2011). Stress and its associated factors amongst ward nurses in a public hospital Kuala Lumpur. *Malaysian J. Public Health Med*. 11(1): 78–85.
- Sonnentag, S., & Frese, M. (2013). Stress in organizations. John Wiley & Sons Inc.
- Sinclair, S. J., Siefert, C. J., Slavin-Mulford, J. M., Stein, M. B., Renna, M., & Blais, M. A. (2012). Psychometric evaluation and normative data for the depression, anxiety, and stress scales-21 (DASS-21) in a nonclinical sample of US adults. *Evaluation & the health professions*, 35(3), 259-279.
- Stein, C. M., Morris, N. J., Hall, N. B., & Nock, N. L. (2017). Structural equation modeling. In *Statistical Human Genetics* (pp. 557-580). Humana Press, New York, NY
- Sedlar, N., Novak, T., Sprah, L., & Socan, G. Risk Assessment Tool for Adverse Outcomes of Occupational Stress: Development and Investigation of its Psychometric Properties.
- Selam, G., & Balew, Z., (2019). Workplace stress and associated factors among healthcare professionals working in public health care facilities in Bahir Dar City, Northwest Ethiopia, *BMC Research Notes*, 12(249).
- Selamawit, S., & Amanuel, A., (2014). Work-Related Stress and Associated Factors Among Nurses Working in Public Hospitals of Addis Ababa, Ethiopia: A Cross-sectional Study. *Workplace health & safety*, 62(8): p. 326–32
- Selye. H., (1956). The stress of life. New York: McGraw-Hill Book Co.

- Shamsuddin, K., Ani, M., Ismail, A., & Ibrahim, M. (2015). Investigation the Safety, Health and Environment (SHE) protection in construction area. *International Research Journal of Engineering and Technology*. 2(6). 624–636.
- Soon, C., & Lam, H. (2013). The growth of seaports in Peninsular Malaysia and East Malaysia for 2007–2011. *Ocean & Coastal Management*. 78. 70–76. doi : 10.1016/ 2013.03.007
- Spielberger, C., & Reheiser, E. (1994). The Job Stress Survey: Measuring gender differences in occupation stress. *Journal of Social Behaviour & Personality*. 9(2). 199-218
- Statistica. (2017). Percentage of employees feeling severely insecure and stressed in their working environment in Japan from 1997 to 2016. Japan stress at work. Personality & Behaviour. Retrieved from <https://www.statista.com>
- Stickle, F., & Scott, K. (2016). Leadership and occupational stress. *Journal of Education Project Innovation*. 137(1). 27-38.
- Swami, M.K., Mathur, D.M., Pushp, B.K., (2013) Emotional intelligence, perceived stress and burnout among resident doctors: an assessment of the relationship. *National Medical Journal of India*, 26(4):210-3.
- Taasoobshirazi, G., & Wang, S. (2016). The performance of the SRMR, RMSEA, CFI, and TLI: An examination of sample size, path size, and degrees of freedom. *Journal of Applied Quantitative Methods*, 11(3), 31-39.
- Takala, J. (2016). World Day for Safety and Health at Work: 2016. The International Commission of Occupational Health, ICOH.
- Talbot, J. (2011). What’s right with risk matrices. Retrieved October, 1, 2011.
- Talbot, J., & Jakeman, M. (2011). Security risk management body of knowledge. 69. John Wiley & Sons.
- Tehranchi, A., Neshat Doost, H. T., Amiri, S., & Power, M. J. (2018). The role of character strengths in depression: A structural equation model. *Frontiers in psychology*, 9, 1609.
- Tearle, P., (2013). Work related stress. *Eur J Bus Soc Sci*.1(10):73–80.
- The National Institute for Occupational Safety and Health (NIOSH). (2014, June 6). Stress in Today’s Workplace. Stress at work. Retrieved from <https://www.cdc.gov/>
- The American Institute of Stress (2014). Workplace Stress. Retrieved from <https://www.stress.org/workplace-stress>
- Thomas, P. (2013). The risk of using risk matrices. University of Stavanger, Norway.
- Theorell, T. (2020). The Demand Control Support Work Stress Model. Handbook of Socioeconomic Determinants of Occupational Health: From Macro-level to Micro-level Evidence, 339-353.
- Theorell, T., Hammarström, A., Aronsson, G., Bendz, L. T., Grape, T., Hogstedt, C., & Hall, C. (2015). A systematic review including meta-analysis of work environment and depressive symptoms. *BMC public health*, 15(1), 1-14.

- Tiusanen, R. (2018). Qualitative Risk Analysis. In N. Moller, S. O. Hansson, J.-E. Holmberg, & C. Rollenhagen (Eds.), *Handbook of Safety Principles* (1st ed., pp. 463–492). <https://doi.org/10.1002/9781119443070.ch21>
- Tuckey, M. R., Searle, B., Boyd, C. M., Winefield, A. H., & Winefield, H. R. (2015). Hindrances are not threats: Advancing the multidimensionality of work stress. *Journal of Occupational Health Psychology*, 20(2), 131.
- Work-related back discomfort and associated factors among automotive maintenance mechanics in Eastern Nigeria: a cross sectional study. 53(4).
- University of Melbourne, (2017). Risk Assessment Methodology. Health & Safety: Risk management requirements. 14
- United States Department of Defence [USDoD]. (2012). MIL-STD-882E: Standard Practice System Safety. Retrieved from <https://www.dau.edu/cop/armyesh/DAU%20Sponsored%20Documents/MIL-STD-882E.pdf>
- Xia, Y., & Yang, Y. (2019). RMSEA, CFI, and TLI in structural equation modelling with ordered categorical data: The story they tell depends on the estimation methods. *Behavior research methods*, 51(1), 409-428.
- Valipour, A., Yahaya, N., Md Noor, N., Antuchevičienė, J., & Tamošaitienė, J. (2017). Hybrid SWARA-COPRAS method for risk assessment in deep foundation excavation project: An Iranian case study. *Journal of civil engineering and management*, 23(4), 524-532.
- Wall, K., (2011). The Trouble with Risk Matrix. DRMI Working Paper Ongoing Research.1–26. USA
- Walters, D., & Wadsworth, J. (2016). Experiences of arrangements for health, safety and welfare in the global container terminal industry. Retrieved from <https://www.iosh.co.uk>
- Wang, H. (2015). The Impact of Social Support on Work Stress and Job Burnout. School of Business, Emporia State University (USA). 1-30
- Wang, K., Xu, Y., Wang, C., Tan, M., & Chen, P. (2020). A Corrected Goodness-of-Fit Index (CGFI) for Model Evaluation in Structural Equation Modeling. *Structural Equation Modeling: A Multidisciplinary Journal*, 27(5), 735-749.
- Wang, K., Shi, H. S., Geng, F. L., Zou, L. Q., Tan, S. P., Wang, Y., ... & Chan, R. C. (2016). Cross-cultural validation of the Depression Anxiety Stress Scale–21 in China. *Psychological assessment*, 28(5), 88
- Wahed, W. Y. A., & Hassan, S. K. (2017). Prevalence and associated factors of stress, anxiety and depression among medical Fayoum University students. *Alexandria Journal of medicine*, 53(1), 77-84.
- Weine, S. M., Langenecker, S., & Arenliu, A. (2018). Global mental health and the National Institute of Mental Health Research domain criteria. *International Journal of Social Psychiatry*, 64(5), 436-442.
- Weller, C., (2017). Japan is facing a ‘death by overwork’ problem — here’s what it’s all about. *Business Insider Malaysia*. October, 18. Retrieved from <https://www.businessinsider.my>

- Wiegand, C., Sulmon, C., Van Baaren, J., Cabello-Hurtado, F., Gouesbet, G., Hennion, F., Mony, C., & Gérard, C. (2015). Abiotic stressors and stress responses: What commonalities appear between species across biological organization levels?. *Environmental Pollution*, 202, 66-77.
- Wijisman, J., Grundlehner, B., Liu, H., Penders, J., & Hermens, H. (2013). Wearable physiological sensors reflect mental stress state in office-like situations. In *Affective Computing and Intelligent Interaction (ACII)*, 2013 Humaine Association Conference. 600–605. doi: 10.1109/2013.105
- Wiatrowski, W. J. (2014). Comparing fatal work injuries in the United States and the European Union. *Monthly Lab. Rev.*, 137, 1.
- Wilson, J. R., & Sharples, S. (Eds.). (2015). *Evaluation of human work*. CRC press.
- Woodhead, E., Northrop, L., & Edelstein, B. (2016). Stress, social support, and burnout among long-term care nursing staff. *Journal of Applied Gerontology*. 35(1). 84 - 105
- Wong, P. Y., Bandar, N. F. A., & Saili, J. (2017). Workplace factors and work-life balance among employees in selected services sector. *International Journal of Business and Society*, 18(S4), 677-684.
- Worksafe New Zealand. (2017, November 17). Work-related health: Work-related stress. Retrieved from <https://worksafe.govt.nz>
- World Health Organization. (1984). Health promotion: a discussion document on the concept and principles: summary report of the Working Group on Concept and Principles of Health Promotion, Copenhagen, 9-13 July 1984 (No. ICP/HSR 602 (m01)). Copenhagen: WHO Regional Office for Europe.
- World Health Organization. (2014). Mental health: a state of well-being. http://www.who.int/features/factfiles/mental_health/en/
- World Shipping Council (2018). Ports: Global Trades. Retrieved from <http://www.worldshipping.org>
- Yahaya, A., Yahaya, N., Amat, F., Bon, T., & Zakariya, Z. (2010). The Effect of various modes of occupational stress, job satisfaction, intention to leave and absentism companies commission of Malaysia. *Australian Journal of Basic and Applied Sciences*. 4(7). 1676–1684. ISSN 1991-8178
- Yakub, N., & Sidik, S. (2014). Prevalence and contributing factors of job strain among crane operators in a port container terminal in Malaysia. *Malays. J. Med. Health Sci*, 10(2). 8.
- Yasin, N. H. M., Rahim, M. A., Hasbollah, H. R., Razak, R. C., Rashid, A. F. A., Nor, M. A. M., & Jamaludin, M. R. (2019). Job Demands, Job Resources and Job Stress among Staff in Malaysia Nursing Home. *Indian Journal of Public Health Research & Development*, 10(11).
- Yildirim, N., Karaca, A., Cangur, S., Acikgoz, F., & Akkus, D. (2017). The relationship between educational stress, stress coping, self-esteem, social support, and health status among nursing students in Turkey: A structural equation modeling approach. *Nurse education today*, 48, 33-39.

- Yun, S., & Kang, J. (2018). Influencing factors and consequences of workplace bullying among nurses: a structural equation modeling. *Asian nursing research*, 12(1), 26-33
- Yusof, N. H. (2016). The effect of job demands and job resources on work stress among administrative staff at College of Business, Universiti Utara Malaysia, Kedah (Doctoral dissertation, Master dissertation), Universiti Utara Malaysia, Malaysia).
- Yusof, Y., Awang, Z., Jusoff, K., & Ibrahim, Y. (2017). The influence of green practices by non-green hotels on customer satisfaction and loyalty in hotel and tourism industry. *International Journal of Green Economics*, 11(1), 1-14. <https://doi.org/10.1504/IJGE.2017.082716>
- Yusri Heni, N. A., & Lasman, A. N. (2010). The Role of BAPETEN in Fostering Safety Culture Implementation at Nuclear Installations. In *Effective Nuclear Regulatory Systems: Further Enhancing the Global Nuclear Safety and Security Regime. Proceedings of an International Conference*.
- Zakaria, Z., Ismail, S., Rani, W. N. M. W. M., Amat, R. C., & Wahab, M. H. (2018). Fire Hazard Assessment During Construction of A Mixed-Use Development Project In Kuala Lumpur. *International Journal of Engineering & Technology*, 7(3.9), 5–10. <https://doi.org/10.14419/ijet.v7i3.9.15262>
- Zamanzadeh, V., Ghahramanian, A., Rassouli, M., Abbaszadeh, A., Alavi Majd, H., & Nikanfar, A. (2015). Design and implementation content validity study: development of an instrument for measuring patient-centered communication. *Journal of Caring Sciences*. 4(2). 165.
- Zanon, C., Brenner, R. E., Baptista, M. N., Vogel, D. L., Rubin, M., Al-Darmaki, F. R., & Zlati, A. (2020). Examining the dimensionality, reliability, and invariance of the Depression, Anxiety, and Stress Scale–21 (DASS-21) across eight countries. *Assessment*, 1073191119887449
- Zerihun A., Abraham G., and Fekadu U., (2018). Occupational health risk of working in garages: comparative study on blood pressure and haematological parameters between garage workers and Haramaya University. community, Harar, eastern Ethiopia. *Risk Management and Healthcare Policy*, 11: p. 35–44
- Zhang, Z., Waszink, A., & Wijngaard, J. (2000). An instrument for measuring TQM implementation for Chinese manufacturing companies. *International Journal of Quality & Reliability Management*. 17(7). 730-755.
- Zikmund, W. G., Carr, J. C., Babin, B., & Griffin, M. (2013). *Business research methods*: Nelson Education
- Zoni, S., & Lucchini, R. G. (2012). European approaches to work-related stress: A critical review on risk evaluation. *Safety and Health at Work*, 3(1). 43–49. doi: 10.5491/2012.3.1.43
- Zou, Patrick X.W., & Sunindijo, R. Y. (2015). *Strategic Safety Management in Construction and Engineering*. Wiley Blackwell
- Zukri, I. & Noor Hassim, I., (2010) A study of occupational stress and coping strategies among correctional officers in Kedah, Malaysia. *Jurnal Kesihatan Masyarakat*. 16(2). 66-74.