KNOWLEDGE AND ATTITUDE OF EMPLOYEES TOWARDS NOISE POLLUTION IN LATEX GLOVE MANUFACTURING INDUSTRY

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FACULTY OF ENGINEERING
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KUALA LUMPUR

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RESEARCH REPORT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE MASTER OF SAFETY, HEALTH AND ENVIRONMENT ENGINEERING

FACULTY OF ENGINEERING
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ABSTRACT

The aim of this study was to determine employees' knowledge and attitude towards noise pollution in latex glove manufacturing industry. A cross-sectional study was conducted involving 100 employees from latex glove manufacturing plant located at Meru, Klang. Questionnaire survey were being distributed among the 100 respondents to retrieve the socio-demography, working profile, knowledge, and attitude towards noise pollution. It was found that only 32% of the total respondents have passed the knowledge test from the questionnaire survey mainly due to the education level of the respondents. Some of the weak areas in terms of knowledge are the prevention knowledge and cause of NIHL knowledge. Besides that, the results also shows that overall mean score of the respondents' attitude is 64.18%, which is higher when compared to the mean score of knowledge (43.62%) due to proper enforcement and effective practical training by the employers. However, some of the weak areas for the overall respondents in terms of attitude towards noise pollution is their health seeking attitude and risk-taking attitude. Lastly, it was found that the nationality, education level and the department of the employees will affect how well is their knowledge and their attitude towards noise pollution. These data were proven significance difference by conducting one way ANOVA analysis using SPSS Software. It is very crucial to have theoretical educational programmes on general prospects of noise pollution and prevention of noise induced hearing loss to the employees to further improve their awareness towards noise pollution.

Keywords: latex glove, knowledge, attitude, noise-induced hearing loss, one way ANOVA.

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PENGETAHUAN DAN SIKAP PEKERJA TERHADAP PENCEMARAN BUNYI DI INDUSTRI PEMBUATAN SARUNG TANGAN LATEKS

ABSTRAK

Tujuan kajian ini adalah untuk mengetahui pengetahuan dan sikap pekerja terhadap pencemaran bunyi di industri pembuatan sarung tangan getah. Kajian keratan rentas dilakukan melibatkan 100 pekerja dari kilang pembuatan sarung tangan getah yang terletak di Meru, Klang. Tinjauan soal selidik diedarkan di antara 100 responden untuk mendapatkan sosio-demografi, profil kerja, pengetahuan, dan sikap terhadap pencemaran bunyi. Didapati bahawa hanya 32% daripada keseluruhan responden yang telah lulus ujian pengetahuan dari tinjauan soal selidik disebabkan oleh tahap pendidikan responden. Beberapa bidang yang lemah dari segi pengetahuan adalah cara pencegahan dan penyebab kehilangan pendegaran. Selain itu, hasilnya juga menunjukkan bahawa skor min keseluruhan sikap responden adalah 64.18%, yang lebih tinggi jika dibandingkan dengan skor min pengetahuan (43.62%) kerana penguatkuasaan yang betul dan latihan praktikal yang berkesan oleh pihak majikan. Namun, beberapa bidang yang lemah bagi keseluruhan responden dari segi sikap terhadap pencemaran bunyi adalah sikap mendapatkan rawatan dan sikap pengambilan risiko. Terakhir, didapati bahawa kewarganegaraan, tahap pendidikan dan jabatan pekerja akan mempengaruhi tahap pengetahuan dan sikap mereka terhadap pencemaran bunyi. Data-data ini terbukti perbezaan yang signifikan dengan melakukan analisis ANOVA sehala menggunakan Perisian SPSS. Ini adalah sangat penting untuk mengadakan program pendidikan teori mengenai prospek umum pencemaran bunyi dan pencegahan gangguan pendengaran yang disebabkan oleh kebisingan kepada pekerja untuk meningkatkan lagi kesedaran mereka terhadap pencemaran bunyi.

Kata Kunci: sarung tangan getah, pengetahuan, sikap, gangguan pendengaran yang disebabkan oleh kebisingan, ANOVA sehala.

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LIST OF SYMBOLS AND ABBREVIATIONS

For examples:

ANOVA	:	Analysis of variance
COVID-19	:	Coronavirus Disease 2019
DALYs	:	Disability adjusted Life years
DOSH	:	Department of Occupational Safety and Health
HD	:	Hearing Disorder
IEC	:	International Electrotechnical Commission
MITI	:	Ministry of International Trade and Industry
NIHL	:	Noise-Induced Hearing Loss
NRA	:	Noise Risk Assessment
OSHA	:	Occupational Safety and Health Act
SARS-CoV-2	:	Severe Acute Respiratory Syndrome Coronavirus 2
SPSS	:	Statistical Package for the Social Sciences
STS	:	Shifts in Hearing Thresholds

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CHAPTER 1: INTRODUCTION

1.1 Introduction

Occupational noise exposure can be considered as one of the most crucial risk factors for hearing loss among workers globally (Razman et al., 2008). In the United States of America, an estimation of 22 million (17%) of workers are being exposed to potential damnaging noise at workplace every year (Sangwoo et al., 2009). On the other hand, in Malaysia, study shows that one of the most significant sources of occupational noise exposure are originating from manufacturing industry, which is accountable for total of 18.1% of the total workforce in Malaysia (Noraita et al., 2014). The fundamental cause of the occupational noise exposure in manufacturing industry in Malaysia is the ongoing utilisation of all sorts of machinery which will be generating excessive noise in the factory plant (Noraita et al., 2014). Some of the major manufacturing industry in Malaysia are rubber processing and manufacturing industry, electronics industry and logging and timber processing industry.

Back in Year 2019, when the outbreak of global pandemic of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), also known as Coronavirus disease 2019 (COVID-19), the demand of rubber gloves has been increasing dramatically (Sangwoo et al., 2009). The glove manufacturing industries in the world especially Malaysia is benefiting financially and economically due to this global pandemic, but it also comes at a cost. According to the Ministry of International Trade and Industry (MITI), the total amount of Malaysia rubber gloves exports from January to July 2020 is RM15.06 billion while compared to the same period last year was RM 10.03 billion (MIDA, 2020). However, with the increasing number of exports of rubber gloves, the production time in rubber glove manufacturing industry must increase to meet the global demand of rubber

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glove. This means that the employees in this industry need work longer than usual and could potentially being exposed to excessive noise that are generated by the machineries in the factory.

Nevertheless, preventive measure can be implemented to avoid loss of hearing due to excessive exposure of load noise in manufacturing industries until some extend (Nasim & Alnuman, 2019). The effectiveness of the preventive measures is also very dependable on the enforcement of the employers and the employees' knowledge and attitude towards noise pollution in the manufacturing industries.

1.2 Problem Statement

Noise pollution is always a challenging issue in glove manufacturing industry. Operators are being exposed to loud noise in the factory for a long period of time during working hours every day, not to mention the increase in demand for latex glove globally due to the outbreak of COVID-19 has caused the operators has to work more than usual. Over exposure of excessive noise could lead to serious impact to auditory and non-auditory effects (Basner, et al., 2014). The most common auditory effect due to excess exposure of noise is loss of hearing while for non- auditory effect could range from annoyance to cardiovascular diseases (Basner, et al., 2014).

Most of the operators working in latex glove manufacturing industry are foreigners who originated from different countries such as Indonesia, Nepal, Bangladesh, Vietnam, and Myanmar, while only a fraction of the operators is Malaysian. As these foreigners are migrating to Malaysia to work at a very young age, most of them does not have a formal education. So, it is questionable on how well they will understand the reason behind the enforcement of compulsory wearing of personal hearing equipment inside the premise of latex glove manufacturing plant (Razman et al., 2008).

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1.3 Aim And Objectives

1.3.1 Aim

To explore the employees' knowledge and attitude towards noise pollution in latex glove manufacturing industry.

1.3.2 Objectives

i) To determine the level of employees' knowledge towards noise pollution in latex glove manufacturing industry.

ii) To determine the employees' attitude towards noise pollution in latex glove manufacturing industry.

iii) To compare the knowledge and attitude of employees towards noise pollution with socio-demographic and working profiles.

1.4 Significance of Studies

In this research, study will be focusing on understanding the level of knowledge and attitude of the employees in glove manufacturing industry towards noise pollution. Besides that, identifying the specific source of noise pollution in rubber gloves manufacturing industry.

The importance of this research could give us better insight and proper guidance on how to control the noise pollution and prevention of over exposure of noise latex glove manufacturing industry.

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CHAPTER 2: LITERATURE REVIEW

2.1 Glove Manufacturing Industry

2.1.1 Natural Rubber Latex

Natural rubber latex can be found in the latex vessel in *Hevea Brasiliensis*, also known as rubber tree. Natural rubber latex comprises of rubber, proteins, resins, minerals, carbohydrates, and water (S.R.O., 2007). Table 2.1 gives a figurative representation the major composition of natural rubber latex.

Table 2.1: Major Composition of Natural Rubber Latex

Component	Content (%)
Rubber	30-40
Proteins	1.0-1.5
Resins	1.5-3.0
Minerals	0.7-0.9
Carbohydrates	0.8-1.0
Water	55-60

Malaysia is acting as one of the largest natural rubber latexes producing country in the world due to its weather and strategic location. In the year of 2016, Malaysia has produced 673,513 tons of natural rubber latexes (LGM, Natural Rubber Statistics, 2019). Most of it has been utilized to produce rubber glove in Malaysia and bringing a total amount of RM 10.49 billion sales revenue in 2016, which is 49% from the total sales revenue from various natural rubber latex manufacturing industries. (LGM, Natural Rubber Statistics, 2016). Some of the other products of natural rubber latex are tyre and inner tubes, rethreading and rebuilding tyre and footwear (LGM, Natural Rubber Statistics, 2019).

2.1.2 Global Market Demand for Rubber Glove

The demand of rubber glove in the global market has been increasing steadily over the year even before the breakout of global pandemic of COVID-19 due to a much better understanding and awareness of health and personal hygiene (Meleth, 2012). As shown

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in Figure 2.1, demand of the global market has risen by 8% from 2010 to 2019 after the 2009 H1N1 Pandemic. In the recent global pandemic of COVID-19, it shows a further step up in global demand in rubber gloves worldwide, a staggering boost of 20% in global demand compared to year 2019 (Kanjanavisut, 2020).

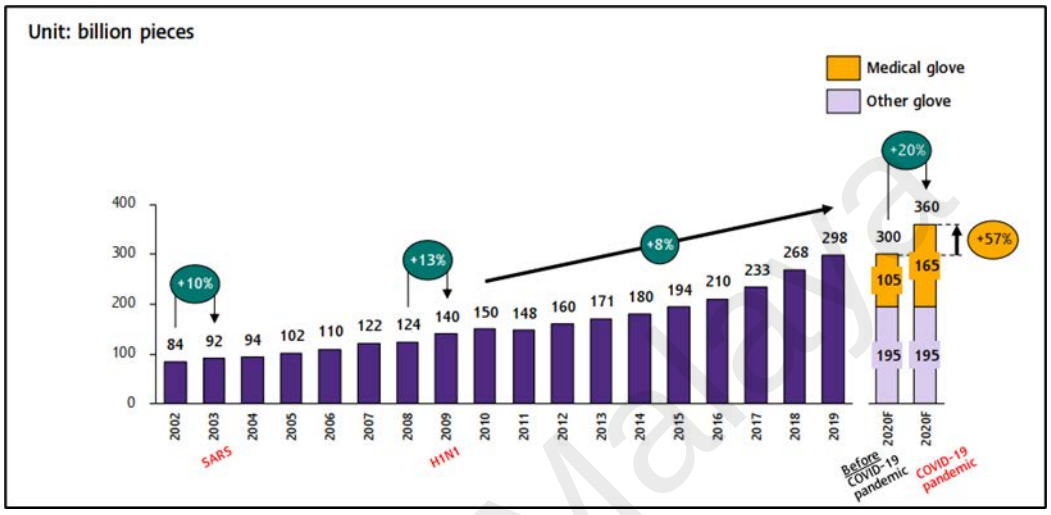

Figure 2.1: Predicted Global Rubber Glove Demand

2.1.3 Types and Functionality of Various Rubber Gloves

There are several types of rubber gloves namely medical gloves, household gloves, industrial gloves, and speciality gloves. The main purpose of medical gloves is to protect the medical practitioners and limit their exposure to infectious matter such as bacteria or virus. Household gloves is mainly used during general household chores such as cleaning and gardening. Besides that, the main function of industrial gloves is to as a protection to workers from sharp materials, heat and chemical. Lastly, speciality gloves are used in special services such as emergency services and police forces (Meleth, 2012).

2.1.4 Manufacturing Process Flow of Rubber Gloves

The main raw material of rubber gloves is latex which will be transferred into compounding tank for compounding with addictive which will be sent to latex tank after

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compounding process has completed. Then former will be cleaned with acid solution in acid tank and dried up before being dipped into coagulant solution. Next, the formers are being dipped into latex tank and leached into hot water tank in order to remove any excess chemicals. For easier donning, the former will be dipped into wet slurry which contain corn starch which then turns into powdered rubber gloves. Lastly, the gloves will be stripped from the former and the whole process starts again from cleaning the former (Yew, et al., 2019). Figure 2.2 shows the overall process flow of powdered rubber gloves.

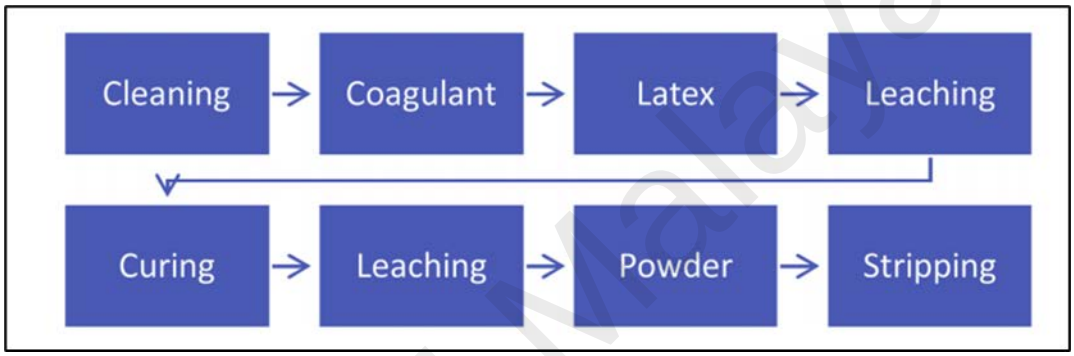

Figure 2.2: Process Flow of Powdered Rubber Gloves

2.2 Sound

2.2.1 Properties of Sound

Sound is a type of mechanical waves that are coming from any vibration of solids and the expansion or compression of any material rapidly (Elert, 2020). Human ears can hear any frequency of sound waves ranges from 20 Hz to 20,000 Hz (Berg, 2020). Any frequency of sound waves lowers than the normal range of human is infrasound vice versa any frequency that is higher than that is ultrasound (Pye & Langbauer, 1998). In another word, human is deaf to any frequency of sound which is out of the normal hearing range of 20Hz to 20,000 Hz (Wang, 2010).

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2.2.2 Measurement of Sound

The magnitude of any sound can be measured by using a Sound Level Meter which is widely available in the market (Dilip & Deepak, 2018). The functional unit of a simple sound level meter is made of microphone, amplifier, weighting network, rectifier, and a display meter reading (Dilip & Deepak, 2018). Figure 2.3 shows the simplified schematic diagram of a functional unit of sound level meter, whereby the microphone acting as an input unit and display meter is the output unit showing the measurement of sound in decibels (dB).

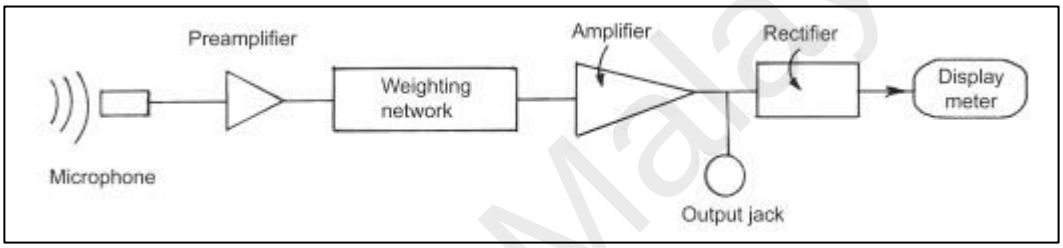

Figure 2.3: The Functional Unit of a Sound Level Meter

2.2.3 Perception of Sound by Human

As we understand that sound is what we can hear in layman term, the human ears can notice any changes of sound level approximately five decibels and the threshold perception level of human ear is around three decibels. This is mainly due to the measurement of sound in decibels is being measured logarithmically (Modular Wall Systems, 2018). Table 2.2 shows the perceived change of human ears towards decibels level.

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Table 2.2: Perceived Change of Human Ears Towards Decibels Level

Change in Sound Level	Perceived Change to the Human Ear
± 1 dB	Not Perceptible
± 3 dB	Threshold of Perception
± 5 dB	Clearly Noticeable
± 10 dB	Twice (or half) as Loud
± 20 dB	Fourfold (4x) as Loud

2.2.4 Perception of Auditory Distance in Human

The perception of auditory distance in human is the potential of human to estimate the distance of the source of sound in any environment and to interpret the sound. It is very crucial as it plays a main role in spatial awareness, enabling location of objects and to avoid any obstacles in the environment (Andrew, Brian, Pavel, Silvia, & Shahina, 2016). The sound level decreases approximately three decibels when the distance is doubled from a line source and the sound level decreases approximately six decibels when the distance is doubled from a point source (Modular Wall Systems, 2018).

2.3 Noise

2.3.1 Definition of Noise Pollution

Noise is recognized as stressor and nuisance of environment. Sources of noise in the environment are from road traffics, railways, airports, industrial and domestics activities. Noise pollution is always linked with industrialization and technological developments (Foo, 2014). This is because whenever there is any new city being developed, population will start to increase, with population increases, the need of transportation will also be increased. This is one of the many factors of noise pollution. Besides that, with the standard of living of the population increases, industrialization must come in order to meet the demands of the population.

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2.3.2 Sources of Common Noise Sources and its Decibels Levels

The noise level can be affected by various type of properties. For an instant, a chainsaw may have a few different noise levels due to its different components that creates different levels of noise. Besides that, noise level is also heavily depended on the distance of noise source and the person listening to it (Modular Wall Systems, 2018). Table 2.3 shows the common sounds and its decibels levels.

Table 2.3: The Common Sounds and its Decibels Levels

Common Sounds	Decibels Level
Jet engine at 5 meters	140 dB
Jet aircraft at 100 meters	130 dB
Rock concert	120 dB
Pneumatic chipper	110 dB
Chainsaw	90 dB
Heavy truck traffic	80 dB
Business office	70 dB
Conversational speech	60 dB
Library	50 dB
Bedroom	40 dB
Secluded woods	30 dB
Whisper	20 dB

2.3.3 Sources of Noise Pollution in Industry

Noise is one of the common occupational hazards in industry. The sources of these noise pollution are originating from the industrial machineries and processes to name a few, rotors, stators, gears, fans, vibrating panels, turbulent fluid flow, impact processes, electrical machines, internal combustion engines. Some of the other's operation that will generate noise pollution in workplace are crushing, drilling, pneumatic equipment, milling machines and grinders (Gerges et al., 2001). The assessment of noise pollution in industry has no fixed predictions method compared to transportation noise as transportation noise are easily predicted given a set of input databases (Enda & Eoin,

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2014). The best method to conduct assessment of noise pollution in industry is by measurement of noise.

2.3.4 Noise Risk Assessment

Identification of source of noise pollution based on work process or operation of machinery. Then measurement of equivalent continuous sound level (L_{eq}) and peak sound level (L_{peak}) is recorded for 8 hours every day for the course of one calendar week. The noise measuring equipment must be complying with the standard determined by the International Electrotechnical Commission (IEC) such as IEC 61672, IEC 61252 and must not be exceeding 12 months of verification done by accredited laboratory or manufacturer (ICOP, 2019).

2.3.5 Environmental Noise Survey

A previous study conducted by Nadir et. al in 2018, shows that noise measurement was conducted in the workstation of workers working in various industry in Karachi City to assess the noise exposure of the said workers. The noise surveys have been completed by following the procedure standard manual of ASTM E-1503 for accurate and precise results (Buksh et al, 2018). It was found that the selected industries which were located in Karachi City has different sound level between 86.6 dBA to 100.8 dBA with a mean value of 92.5 dBA. This mean value has exceeded the Pakistan standard of 85dBA (Buksh et al, 2018). Based on another environmental noise survey report, some of the instrument used during that noise survey are automated logging sound level meter, microphone, pre-amplifier, Outdoor microphone casing and a calibrator (Richardson, 2014).

2.3.6 Noise Mapping

Graphic representation of sound level distribution is plotted in the form of contour map to clearly shows the intensity of noise level at the targeted area. Coloured contours are usually used to indicate the intensity of noise level by overlapping on a plan workplace

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or map of an area. There is various type of software can be used to generate noise map. In the previous study done by Anastasia et. al, the software used for noise mapping was Predictor – LimA Type 7810B Version 10.1 software as this software takes into consideration of the specifications of the EC/2002/49 Directive for intermediate calculation methods, as well as the IPPC EC/2008/1 Directive for industrial noise (Anastasia et al., 2019). Figure 2.4 shows the strategic noise mapping of industrial in the port of Piraeus.

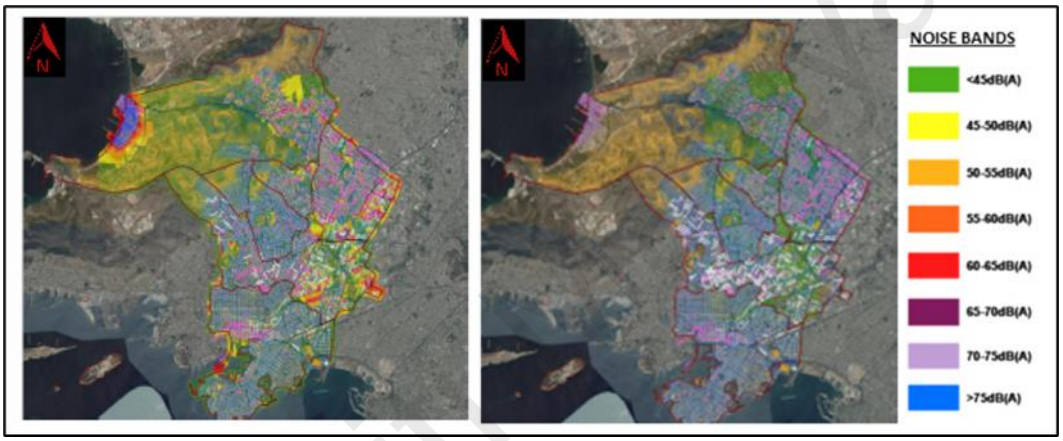

Figure 2.4: Strategic Noise Mapping of Industrial in the Port of Piraeus, during the day (left panel) and the night (right panel)

According to the Guidelines for Environmental Noise Limits and Control by Department of Environmental Malaysia, noise zone can also be demonstrated in sound level ranges of 5 dBA L_{Aeq} increment.

2.3.7 Noise Pollution Control

There are a few types of noise pollution controls in industry. Generally, noise pollution can be reduced by replacing another alternative of a machinery or equipment that produces less noise. Besides that, machinery can be isolated or insulated to reduce the noise being produced. And lastly, a method which is most commonly used, which is providing hearing protective devices to the operators to reduce the exposure to the noise in their workplace (Peirce, Weiner, & Vesilind, 1998).

Furthermore, according to the Guidelines for Environmental Noise Limits and Control by Department of Environmental Malaysia, The Project Proponent, and/or any other occupier of any industrial or trade premises, construction sites, and/or person(s) responsible for excessive sound generation should use the "best practical means" to minimize the sound generation and reduce its propagation to the environment.

2.4 Noise Related Regulation In Malaysia

In Malaysia, the authority that are responsible to ensure compliance and safeguard the occupational safety, health, and welfare of workers of Malaysia is the Department of Occupational Safety and Health (DOSH).

Factories and Machinery (Noise Exposure) Regulations 1989 was initially introduced under Factories and Machinery Act 1967. Despite being introduced for 30 years in Malaysia, the cases of noise- induced hearing loss (NIHL) are still rising every year (Ahmad & Razali, 2019). This regulation has been superseded by Occupational Safety and Health Act (Noise Exposure) 2019 starting from 1st June 2019. The new regulation has become more stringent as Noise Risk Assessment (NRA) must be conducted by Noise Risk Assessor annually whereby the FMA (Noise Exposure) Regulation 1989 stated that NRA only required when there is any newly introduction of machinery, equipment, process, work, or control measure (Razali, 2019).

Furthermore, OSHA (Noise Exposure) Regulation 2019 also has lowered down the daily noise exposure limit and increased the penalty for non-compliance. In overall, the new changes in the current noise exposure regulation are to be expected to have a better control over the industrial noise exposure and gradually reducing the occurrence of noise related disorder in the working population (Manivasagam, 2019). Table 2.4 shows the comparison FMA (Noise Exposure) Regulation 1989 and OSHA (Noise Exposure) Regulation 2019.

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Table 2.4: Comparison FMA (Noise Exposure) Regulation 1989 and OSHA (Noise Exposure) Regulation 2019

FMA (Noise Exposure) Regulation 1989	Excessive Noise	OSHA (Noise Exposure) Regulation 2019
90	Daily Noise Exposure Level, dB(A)	82
No	Registration of ATC	Yes
Fine not exceeding RM 1,000	Penalty	Fine not exceeding RM 10,000 or imprisonment for a term not exceeding 1 year or both

2.5 Auditory And Non-Auditory Effect of Excessive Noise Towards Human Health

According to the Department of Occupational Safety and Health (DOSH), more than 60% of the occupational related cases have been contributed by occupational noise-related hearing disorder (HD) due to the consequences of industrial noise pollution over the past decades. In fact, in 2017 the total percentage of occupational noise-related hearing disorder (HD) was as high as 88% from the total cases Occupational Diseases & Poisonings. Figure 2.5 shows the recorded cases of occupational diseases and poisoning among the population of Malaysia in 2017 (DOSH, 2017).

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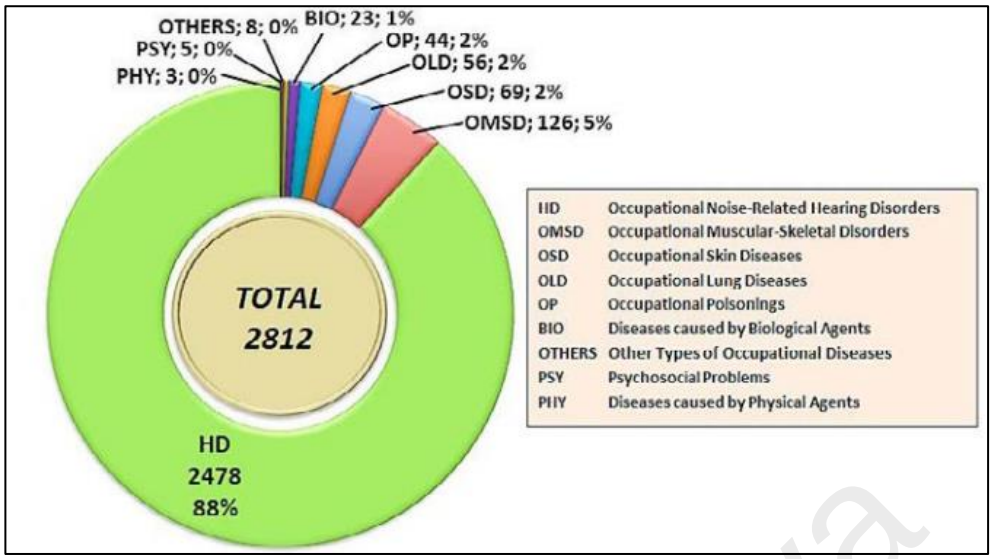

Figure 2.5: Occupational Diseases and Poisoning Among the Population of Malaysia in 2017

2.5.1 Auditory Effect of Excessive Noise Towards Human Health

2.5.1.1 Occupational Noise Induced Hearing Loss

This type of hearing loss is closely related to workers that are being exposed to excessive noise risk at their workstation. There are two types of situations that can caused hearing loss due to occupational hazard which is acoustic trauma and long-term effect following exposure to noise.

Possible signs and symptoms are the workers will experience hearing reduction in one or both ears. Besides that, the workers will also experience tinnitus where they could hear ringing or buzzing sounds (Sirajuddin et al., 2012).

2.5.1.2 Hearing Impairment

Over exposure to excessive noise could also lead to hearing impairment of the workers working in any industry for a prolong period. Hearing impairment is the damage done to one or more parts of an individuals' ears.

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2.5.1.3 Shifts in Hearing Thresholds (STS)

Other than that, over exposure of loud noise can also lead to shift in hearing threshold. A shift in the standard threshold of hearing is the change in the hearing threshold when compared to the baseline audiogram of an average of 10 dB or more in 2000, 3000 and 4000 Hz (ICOP, 2019). This shift of hearing thresholds could be temporary or permanent. A temporary standard threshold shifts also known as auditory fatigue where the shifted hearing threshold shows progressive reduction (improvement in hearing threshold) over the time when the employee is no longer exposed to the noise pollution. On the other hand, a permanent STS is irreversible and remains throughout the lifetime of the affected workers (ICOP, 2019).

2.5.2 Non-Auditory Effect of Excessive Noise Towards Human Health

2.5.2.1 Annoyance

Over exposure to excessive noise could lead to annoyance as it may be disturbing our daily activities. Annoyance is an emotional thought whereby it could cause negative reaction to human such as anger and displeasure (Basner et al., 2014).

2.5.2.2 Sleep Disturbance

Noise pollution can also greatly affect the quality of an individuals' sleeping pattern. In a research previously conducted by Anastasia et al. in year 2019, they have applied the Disability adjusted Life years (DALYs) to assess the disease burden of noise pollution. It was found out in their research that an estimation of a total loss of 2197 DALYs from sleep disturbance due to road traffic noise in their study area of Piraeus, Greece (Anastasia et al., 2019).

2.5.2.3 Cognition Deficit

Cognitive deficit is also one of the negative effects of noise pollution. Cognitive deficit can be defined as an impairment of an individuals' mental process whereby he or she

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finds it hard to concentrate and acquire information and knowledge. A research by Anastasia et al. in year 2019, they found out that an estimation of a total loss of 5420 DALYs from cognition deficits in students due to road traffic noise in their study area of Piraeus, Greece (Anastasia et al., 2019).

2.5.2.4 Cardiovascular Disease

Being exposed to excessive noise could also lead to cardiovascular related disease such as hypertension, ischaemic heart diseases, and stroke (Basner et al., 2014). This is mainly due to the disproportion of organism's homoeostasis which directly affecting our metabolism and increase the risk of cardiovascular relate diseases.

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CHAPTER 3: METHODOLOGY

3.1 Research Design

Cross-sectional non-experimental research was implemented in this research. It is a type of study utilizing various groups of people from different ages who are different in the interest variability but sharing other common attribute for example educational background and socioeconomic status (Olsen & George, 2004). In this nature of study, these individuals are either selected from the entire population or a subset of the population, data that are being collected will help to answer research questions of interest. This research is to determine the knowledge and attitude of employees towards noise pollution in latex glove manufacturing industry. The data was collected from the subset of the total employees of one of the latex glove manufacturing factories in Meru, Klang to answer the questionnaire.

Quantitative analysis was used to analyse the data collected to provide a numeric and quantifiable data. Furthermore, descriptive study also used to determine the relationship between variables. Two types of quantitative research methods such as descriptive and inferential methods were implemented for the analysing of quantitative data. Descriptive data such as frequency, percentages, mean, median and standard deviation were used in order to determine the score of knowledge and attitude of employees towards noise pollution. For inferential data, for instance discrete or continuous data were used to compare the relationship between the knowledge and attitude of employees towards noise pollution with their socio-demographic and working profiles.

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3.2 Study Location

This research was conducted at Meru, Selangor, Malaysia. Meru is in Klang District which is the largest latex glove manufacturing industry is located at. Meru is located about 40km east of Federal Territory of Kuala Lumpur and about 20km northeast of Port Klang.

3.3 Sampling Framework and Types of Sampling

A sampling framework is a set of subjects or respondents within a population with the aim of achieving research objectives (Turner, 2003). Factory 12 glove manufacturing plant was selected to carry out this study.

Convenience sampling and purposive sampling are used in this study. This type of sampling method is relying on solely on the conveniently of the respondents to participate in the study (Gravetter & Forzano, 2011). This sampling method is widely used in behavioural science research. In convenience sampling, people are selected based on their willingness and availability to respond towards any study being conducted. The advantages of this sampling method are it is relatively easier, inexpensive when comparing with other techniques and the data collection can be completed in short duration of time (Andale, 2015; Dudovskiy, 2016).

In this study, convenience sampling was used to select the location for sampling. This is because there was high probability to find potential participant of the study as all the employees are working in this manufacturing plant. Furthermore, purposive sampling was also used in this study.

Purposive sampling, also known as selective, subjective, or judgemental sampling. Population of this study are being selected based on the characteristic and objective of the study, which is also known as non-probability sampling (Crossman, 2017). The selection of subjects is decided purposely by judging them to be exemplary of the population or

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particularly knowledgeable about the topic of the specific study. This method can be used to advantage in certain situations such as researchers usually used purposive sampling to find the sample of experts (Polit & Beck, 2010). This sampling method is used to choose the specific departments in the latex manufacturing plant, which is from manufacturing, packing, production, compounding, former, quality assurance, and warehouse department. However, this does not limit to employees from other department who are willingly to participate in this study.

3.4 Questionnaire Survey

Self-administered questionnaire was used for the data collection, which was enclosed in Appendix A, whereby respondents will answer the questionnaire survey based on their own understanding towards the study topic (Olsen & George, 2004). It is a tool for data with a set of predetermined questions for the collection and recording of information about a particular topic of interest and always have a define purpose, which is related to the research objectives (Kember and Leung, 2008).

Closed-ended question had been used in questionnaire. It was a form of question in which answer had been given for the respondents to choose. This type of question was easier to answer, analysed and computed as compared with open-ended questionnaire. Both Malay and English version were being provided in the questionnaire. However, step by step explanation on the questionnaire were done in case the respondents are involving to foreigners that are unable to fully understand Malay or English.

The questionnaire comprises four sections. In general, some items were adopted from the relevant references, and some were modified according to the context of this study. Some multiple-choice questions were provided with the answer of ‘Tue’, ‘False’ and ‘Not Sure’. For each question answered correctly will be equivalent to 1 mark while answered

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wrongly and 'Not Sure' will not have any mark. Moreover, five-point Likert scale was also used in questionnaire.

Section 1 in questionnaire was socio-demographic profile of the participants. There were a total 6 of question including race, gender, nationality, age range, level of education, and status of marriage (Razman et al., 2008). Nominal scale and ordinal scale were used in this section. Questionnaire in Section 2 was regarding about employees' working profile which includes working department, job position, year of service, and monthly income range.

Employees's knowledge towards noise pollution were being tested in Section 3 with a total of 8 mutliple choice question of 'True', 'False' and 'Not Sure' in this section. While for Section 4, employees' attitude towards noise pollution was asked. Ordinal scale which was five-point likert scale was implemented in this session starting from 'Strongly Disagree' was counted as 1 mark while 'Strongly Agree' was counted as 5 mark.

3.5 Data Collection

A total of 100 self-administrated questionnaire were distributed to the employees of the said latex glove manufacturing plant. Before answering the questionnaire, a clear instruction was given to the respondents, for instance the purpose of this study, and definition of noise pollution. This initial step improved the understanding and willingness of respondents to participate in furthering this study. Once they have finished answering the questionnaire, the researcher collected and checked it to make sure all the details were filled. Any incomplete data was treated as missing data and was excluded before starting the statistical analysis.

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3.6 Data Analysis

A total of 100 respondents were being analysed by using IBM Statistical Package for Social Science (SPSS) version 25. Prior to analysis, all data will be tested for normality. The data was assumed to be normal in this study as sample size > 30 or 40, and parametric procedures can be used even when the data are not normally distributed as the violation of the normality assumption should not cause major problem (Ghasemi & Zahediasl, 2012).

Descriptive statistics are used to describe the basic features of the data in a study by providing simple summaries about the sample and the measures (William, 2006). Descriptive statistics is concerned with collection, organization, enumeration of the frequency of characteristics, summarisation, and presentation of data. It was used to analyse data for section 1, 2, 3, and 4 which are socio-demographic profile, employees' working profile, employees' knowledge, and attitude towards noise pollution. All the data were presented in frequency (n) and percentage (%). Meanwhile, knowledge and attitude of the employees towards noise pollution were presented in mean and standard deviation. In addition of that, one way ANOVA was used in SPSS to compare socio-demographic and working profiles of employees with their knowledge and attitude scoring towards noise pollution. It was convenience to use and the output data was clear and simple (Khan, 2013). However, one assumption has to be fulfilled before using this test, which is the significance value was set at 0.05 for all statistical analysis for this study.

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CHAPTER 4: RESULTS AND ANALYSIS

4.1 Introduction

Chapter 4 shows the summaries of all the data collected from all the participants of this study and being analyzed by using SPSS. Subtopics of this chapter consist of socio-demographic and working profiles of employees. Besides that, the mean, standard deviation and specific breakdown of the employees' knowledge and attitude towards noise pollution in latex glove manufacturing industry could also be found in this chapter.

4.2 Socio-Demographic Profile

A total of 100 survey questionnaires were distributed through purposive. The entire questionnaire had been completely answered by respondents since every questionnaire was checked before the respondents leave. As shown in Table 4.1, the study involved majority of male employees which is 76%. This gender contrast can be proven by the report from Khazanah Research Institute, which states that participation of women in the Malaysia workforce is lower than men (KRI, 2017). Most of the employees are foreigner (63%), while only 37% of the employees are Malaysian. The huge gap in terms of nationality that are participated in this study can be explained by the Labour Force Survey Report of Malaysia in Year 2020 (Department of Statistics, 2020). According to the report, there is a total of 82.5% workforce are coming from non-Malaysian citizenship. Furthermore, 51% of the total participant of this study has never gone through formal education either from their original country or Malaysia. This can also be proven true that a total of 78.5% of foreign work force does not gone through formal education (Department of Statistics, 2020).

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Table 4.1: Socio-Demographic Profile

Variables		Frequency (n)	Percentage (%)
Gender	Male	76	76.0
	Female	24	24.0
Race	Chinese	12	12.0
	Malay	18	18.0
	Indian	8	8.0
	Others	62	62.0
Nationality	Malaysia	37	37.0
	Indonesia	7	7.0
	Nepal	16	16.0
	Bangladesh	35	35.0
	Myanmar	2	2.0
	Vietnam	2	2.0
	Maldives	1	1.0
Age	18 to 25 years old	30	30.0
	26 to 35 years old	37	27.0
	36 to 45 years old	22	22.0
	46 to 55 years old	10	10.0
	56 years old and above	1	1.0
Marital Status	Single	47	47.0
	Married	52	52.0
	Divorced/Widowed	1	1.0
Education Level	No Proper Education	51	51.0
	Secondary	14	14.0
	Diploma	13	13.0
	Degree	20	20.0
	Masters/PhD	2	2.0

4.3 Employees' Working Profile

Table 4.2 shows the basic employees working profile of all the participant in this study. It was found that almost half (47%) of the employees are working as operator consisting of 38% from packing department and 16% from production department. Majority of the

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employees have served in the latex glove manufacturing company for 2 to 5 years with an average income of between RM1,500 to RM2,999 per month.

Table 4.2: Employees' Working Profile

Variables		Frequency (n)	Percentage (%)
Department	Administrative	1	1.0
	Compounding	8	8.0
	Engineering	1	1.0
	Finance	1	1.0
	Former	3	3.0
	Human Resources	2	2.0
	IT	3	3.0
	Logistics	1	1.0
	Maintenance	12	12.0
	Manufacturing	3	3.0
	Packing	38	38.0
	Production	16	16.0
	Quality Assurance	3	3.0
	Safety	4	4.0
	Warehouse	4	4.0
Position	Internship	2	2.0
	Operator	47	47.0
	Supervisor	18	18.0
	Junior Management	11	11.0
	Middle Management	18	18.0
	Upper Management	4	4.0
Year of Service	1 Year & Below	12	12.0
	1 to 2 Years	20	20.0
	2 to 5 Years	43	43.0
	5 to 10 Years	18	18.0
	10 Years & Above	7	7.0
Monthly Average Income	Less Than RM1,499	2	2.0
	RM1,500 to RM2,999	68	68.0
	RM3,000 to RM3,999	14	14.0
	RM4,000 to RM4,999	12	12.0
	RM5,000 to RM5,999	2	2.0
	RM6,000 and above	2	2.0

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4.4 Employees' Knowledge Towards Noise Pollution

As per shown in Table 4.3 is the overall mean score and standard deviation of employees' knowledge towards noise pollution. While the specific breakdown of each question answered correctly by all the participant is shown in Table 4.4

Table 4.3: Overall Mean Score & Standard Deviation in Knowledge of Employees

Mean Score	Standard Deviation
43.62	38.41

. From Table 4.4, it is obvious that most of the employees does not have adequate knowledge on whether hearing loss due to noise can be recovered if a person is no not being exposed to excessive noise any longer (C5). Whereby only 26% of the total participant have answered question C5 correctly. On the other hand, 62% of the total respondents know for sure that it is the employers' responsibility to provide ear plug to the employees (C7), which is the highest score in Section 3.

Table 4.4: Specific Weak Areas in Knowledge

No.	Description	Correct Answers (%)
C1	Loud noise in latex glove manufacturing can cause hearing impairment/loss.	41.0
C2	Hearing deteriorates when employees are exposed to hazardous noise.	55.0
C3	Hobbies such as shooting and listening to loud music can cause hearing loss.	35.0
C4	Hearing loss due to noise can treated by taking medicine.	39.0
C5	Hearing loss due to noise will recover to normal if a person is no longer exposed to excessive noise.	26.0
C6	Malaysia has a law that is protecting employees who are being exposed to noise in the workplace.	40.0
C7	Employers has the responsibility to provide ear plugs.	62.0
C8	Employees has the responsibility to wear ear plugs.	51.0

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4.5 Employees' Attitude Towards Noise Pollution

As per shown in Table 4.5 is the overall mean score (64.18%) and standard deviation (21.21) of employees' attitude towards noise pollution. It is proven from the results that all the participants in the study are having an average of 64.18 in terms of good attitude towards noise pollution in latex glove manufacturing industry.

Table 4.5: Overall Mean Score & Standard Deviation in Attitude of Employees

Mean Score	Standard Deviation
64.18	21.21

Table 4.6 shows the specific breakdown of each question answered correctly by all the participants in this study. Only 56.60% of the participant have the correct attitude to seek for professional treatment instead of traditional medicine if they encounter hearing loss in the early stage (D3), which is the lowest among all the question in terms of employees' attitude. While there is 69.40% of the total respondents shows a good attitude by proving that they should wear ear plug to avoid from having hearing loss (D5).

Table 4.6: Specific Weak Areas in Attitude

No.	Description	Good Attitude (%)
D1	I am not disturbed by noise in the workplace	63.20
D2	I am not concerned if I cannot hear properly after working in noisy places because it is only temporary	64.20
D3	I will seek for traditional medicine if I have hearing loss in the early stage	56.60
D4	I do not have to inform my employer if I have hearing loss	66.40
D5	We should wear the ear plug to avoid hearing loss due to noise	69.40
D6	We should inform the employers if the machine is somehow noisier than before	65.20
D7	Health education and awareness training regarding methods on self-protection towards noise should be done from time to time to employees.	68.00
D8	It is a usual thing for me to work in a noisy environment.	60.40

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CHAPTER 5: DISCUSSION

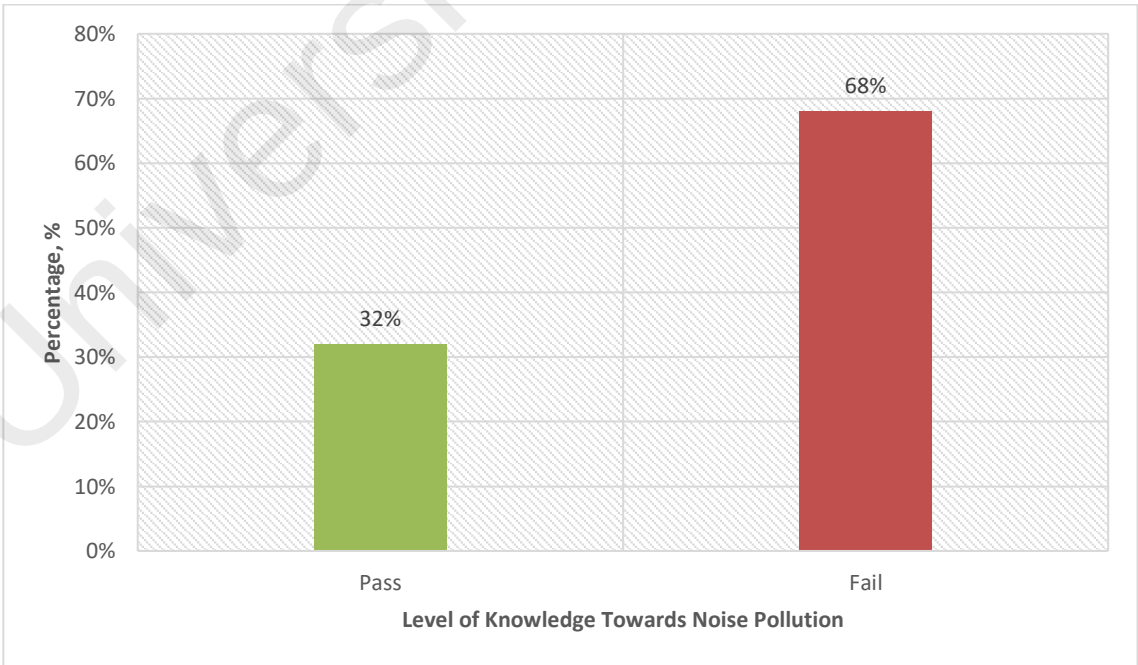
5.1 Introduction

As per shown in Chapter 4, the overall mean knowledge (Table 4.3) and attitude (Table 4.5) of the employees towards noise pollution in latex glove manufacturing industry are relatively low which is below satisfactory level. The results shown in Chapter 4 will be further analysed and discussed in the subtopics of Chapter 5.

5.2 Level of Employees' Knowledge Towards Noise Pollution

Employees' knowledge towards noise pollution in latex glove manufacturing is categorised into 2 category which is pass and fail. In order to pass, respondents have to answer at least 75% correctly for Section 2 otherwise it will be considered as fail (Razman et al., 2008). Figure 5.1 shows the level of employees' knowledge towards noise pollution.

Figure 5.1: Level of Employees' Knowledge Towards Noise Pollution



As shown in Figure 5.1, it is very obvious that majority of the respondents have failed (68%) in the Section 2 which is to test the knowledge towards noise pollution in latex

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glove manufacturing industry. While on the other hand, only a mere 32% from the total respondents have passed in this section. These results could be directly related to the employees' socio-demographic and working profiles. Further analysis will be conducted in the next subtopics using One Way ANOVA Test.

5.3 Comparison of Employees' Knowledge Score among Socio-Demographic Profile

One Way ANOVA Test was used to compare employees' knowledge score between socio-demographic profile such as gender, races, nationality, age, marital status, and education level. Table 5.1 shows the comparison of employees' knowledge towards noise pollution in latex glove manufacturing industry between socio-demographic profile.

Table 5.1: Mean Score of Employees' Knowledge Towards Noise Pollution with Socio-Demographic Profile

Knowledge		n	Mean ± SD	p-value
Gender	Male	76	39.80 ± 36.50	0.076
	Female	24	55.72 ± 43.63	
Race	Chinese	12	96.88 ± 5.65	4.8986E-20
	Malay	18	70.14 ± 30.36	
	Indian	8	81.25 ± 29.88	
	Others	62	20.76 ± 23.40	
Nationality	Malaysia	37	82.77 ± 25.06	7.406E-22
	Indonesia	7	5.35 ± 9.83	
	Nepal	16	40.62 ± 26.02	
	Bangladesh	35	16.07 ± 18.33	
	Myanmar	2	0	
	Vietnam	2	0	
	Maldives	1	50.00 ± 0.00	
Age	18-25 years old	30	44.16 ± 36.51	0.004
	26-35 years old	37	58.44 ± 39.31	
	36-45 years old	22	25.00 ± 29.37	
	46-55 years old	10	23.75 ± 36.53	
	56 years old and above	1	87.50 ± 0.00	

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Knowledge		n	Mean ± SD	p-value
Marital Status	Single	47	56.11± 39.51	0.008
	Married	52	32.69 ± 34.40	
	Divorced/Widowed	1	25.00 ± 0.00	
Education Level	No Proper Education	51	18.13 ± 21.83	1.6506E-23
	Secondary	14	33.03 ± 25.29	
	Diploma	13	67.30 ± 29.99	
	Degree	20	95.00 ± 10.25	
	Masters/PhD	2	100.00 ± 0.00	

Note:
One way ANOVA was used for gender, races, nationality, age, marital status, and education level.
*Significant of $p < 0.01$ using One way ANOVA
Employees' knowledge (Scale: True/False/Not Sure) - min. score= 0; max. score= 100

Result revealed that there was significant difference found for comparison of knowledge score among socio-demographic profile of races, nationality, age, marital status, and education level. On the other hand, only gender does not show that there is a significant difference which has a p-value of 0.076 (>0.01).

Through this study, it was found that nationality is closely correlated to the level of knowledge of employees towards noise pollution, with a p-value of 7.406E-22 (<0.01). Malaysian employees tend to score higher than the other employees originated from other nationality. However, this does not mean that foreigner workforce other than this sample study will score lower than Malaysian, as the level of knowledge are mainly dependable on education level of the employees (Aminrad et al., 2013; Ankeeta et al., 2016). From Table 5.1, total of 51 respondents that did not have formal education has a mean score of 18.13%, the mean score of knowledge increases when the respondents have higher form of education. This result can be further confirmed by the p-value of education level in comparison of level of knowledge which is 1.6506E-23 (<0.01).

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5.4 Comparison of Employees' Knowledge Score among Working Profile

Employees' working profiles such as department, position, year of service and average monthly income were being compare with the knowledge score by using one way ANOVA. Table 5.2 shows the comparison of employees' knowledge towards noise pollution in latex glove manufacturing industry between their working profile.

Table 5.2: Mean Score of Employees' Knowledge Towards Noise Pollution with Working Profile

Knowledge		n	Mean ± SD	p-value
Department	Administrative	1	100.00 ± 0.00	2.8906E-9
	Compounding	8	54.68 ± 16.28	
	Engineering	1	75.00 ± 0.00	
	Finance	1	100.00 ± 0.00	
	Former	3	58.33 ± 40.18	
	Human Resources	2	100.00 ± 0.00	
	IT	3	79.16 ± 26.02	
	Logistics	1	0	
	Maintenance	12	54.16 ± 33.00	
	Manufacturing	3	100.00 ± 0.00	
	Packing	38	14.47 ± 24.57	
	Production	16	51.56 ± 33.81	
	Quality Assurance	3	62.50 ± 45.06	
	Safety	4	96.87 ± 6.25	
	Warehouse	4	34.37 ± 44.92	
Position	Operator	47	10.63 ± 14.73	3.0455E-32
	Supervisor	18	49.30 ± 17.40	
	Internship	2	62.50 ± 17.67	
	Junior Management	11	68.18 ± 32.76	
	Middle Management	18	95.13 ± 9.71	
	Upper Management	4	96.87 ± 6.25	
Year of Service	1 Year & Below	12	48.95 ± 40.04	0.413
	1 to 2 Years	20	30.62 ± 35.23	
	2 to 5 Years	43	44.47 ± 41.30	
	5 to 10 Years	18	45.83 ± 36.63	
	10 Years & Above	7	60.71 ± 27.41	
	Less Than RM1,499	2	81.25 ± 8.83	3.5923E-20

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Knowledge		n	Mean ± SD	p-value
Monthly Average Income	RM1,500 -RM2,999	68	22.79 ± 23.94	
	RM3,000 -RM3,999	14	77.67 ± 30.29	
	RM4,000 -RM4,999	12	97.91 ± 4.86	
	RM5,000 -RM5,999	2	93.75 ± 8.83	
	RM6,000 and Above	2	100.00 ± 0.00	

One way ANOVA was used for department, position, year of service and monthly average income.
*Significant of $p < 0.01$ using One way ANOVA
Employees' knowledge (Scale: Strongly Disagree/Slightly Disagree/Neutral/Slightly Agree/Strongly Agree) - min. score= 0; max. score= 100

From Table 5.2, it shows that there is a significant difference for comparison of knowledge score among working profile such as department, position, and monthly average income. However, the duration of service in the latex glove manufacturing factory has no direct relationship to the knowledge score in this study with a p-value of 0.413 (>0.01).

Specific departments such as administrative, engineering, finance, information technology, human resources, manufacturing, and safety departments has a mean score of 75% and above which is considered as passing score. This is because that these departments required skilled employees with education level of at least diploma and above. On the other hand, other departments are requiring workforce regardless of any specific education level. As per discussed on the previous subtopics, level of education is closely related to the knowledge scored. Therefore, this explains that employees from some specific departments are able to pass the knowledge test towards noise pollution.

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5.5 Comparison of Employees' Attitude Score among Socio-Demographic Profile

As for the comparison of employees' attitude score among socio-demographic profile, the finding is similar to the comparison of employees' knowledge. Table 5.3 shows the mean score of employees' attitudes towards noise pollution with socio-demographic profile.

Table 5.3: Mean Score of Employees' Attitude Towards Noise Pollution with Socio-Demographic Profile

Knowledge		n	Mean ± SD	p-value
Gender	Male	76	61.34 ± 20.72	0.017
	Female	24	73.12 ± 20.63	
Race	Chinese	12	77.77 ± 10.77	6.6112E-15
	Malay	18	90.41 ± 10.04	
	Indian	8	83.43 ± 24.05	
	Others	62	52.66 ± 15.48	
Nationality	Malaysia	37	84.45 ± 11.93	1.2914E-16
	Indonesia	7	51.78 ± 6.40	
	Nepal	16	61.09 ± 17.98	
	Bangladesh	35	48.64 ± 14.90	
	Myanmar	2	40.00 ± 3.53	
	Vietnam	2	47.50 ± 3.53	
	Maldives	1	75.00 ± 0.00	
Age	18-25 years old	30	63.58 ± 19.48	0.001
	26-35 years old	37	73.64 ± 20.51	
	36-45 years old	22	52.38 ± 15.61	
	46-55 years old	10	54.50 ± 24.48	
	56 years old and above	1	87.50 ± 0.00	
Marital Status	Single	47	68.98 ± 21.74	0.085
	Married	52	60.14 ± 20.08	
	Divorced/Widowed	1	47.50 ± 0.00	
Education Level	No Proper Education	51	51.81 ± 15.74	4.4487E-17
	Secondary	14	56.78 ± 16.09	

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Knowledge		n	Mean ± SD	p-value
	Diploma	13	76.34 ± 11.30	
	Degree	20	89.37 ± 8.84	
	Masters/PhD	2	100.00 ± 0.00	

One way ANOVA was used for gender, races, nationality, age, marital status, and education level.
*Significant of $p < 0.01$ using One way ANOVA
Employees' attitude (Scale: True/False/Not Sure) - min. score= 0; max. score= 100

One Way ANOVA was being used to compare for the attitude of employees in this section. It was found out that gender and marital status has no significance difference between the attitude of the employees towards noise pollution, with a respective p-value of 0.017 and 0.085, whereby both are less than 0.01. On the other hand, race, nationality, age, and education level has a significance difference of less than 0.01 between the attitude of the employees towards noise pollution. This as well, can be deduced that with higher education level, employees will have better awareness on the noise pollution (Aminrad et al., 2013; Ankeeta et al., 2016). Therefore, they will have a better attitude when dealing with noise pollution in latex glove manufacturing industry.

5.6 Comparison of Employees' Attitude Score among Working Profile

One Way ANOVA was used to compare the employee's attitude score among working profile, it was found the results is similar to what has been portrayed on the comparison of employees' knowledge score among working profile. Table 5.4 shows the mean score of employees' attitudes towards noise pollution with their individual working profile.

Similarly, all the departments that scored more than 75% for the knowledge towards noise pollution also able to achieve similar result in attitude this section which indicating that education levels are greatly related to how the employees will react to noise pollution and prevention of noise induced hearing loss.

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Table 5.4: Mean Score of Employees' Attitude Towards Noise Pollution with Working Profile

Knowledge		n	Mean ± SD	p-value
Department	Administrative	1	97.50 ± 0.00	4.1447E-9
	Compounding	8	69.37 ± 12.30	
	Engineering	1	85.00 ± 0.00	
	Finance	1	100.00 ± 0.00	
	Former	3	63.33 ± 31.25	
	Human Resources	2	100.00 ± 0.00	
	IT	3	79.16 ± 3.81	
	Logistics	1	60.00 ± 0.00	
	Maintenance	12	69.16 ± 15.08	
	Manufacturing	3	98.33 ± 2.88	
	Packing	38	49.07 ± 16.10	
	Production	16	68.75 ± 17.88	
	Quality Assurance	3	72.50 ± 16.39	
	Safety	4	94.37 ± 3.75	
	Warehouse	4	51.87 ± 12.14	
Position	Operator	47	45.90 ± 12.52	3.6118E-26
	Supervisor	18	70.69 ± 5.86	
	Internship	2	80.00 ± 7.07	
	Junior Management	11	79.09 ± 12.71	
	Middle Management	18	87.91 ± 10.15	
	Upper Management	4	93.75 ± 9.46	
Year of Service	1 Year & Below	12	65.00 ± 23.42	0.358
	1 to 2 Years	20	57.12 ± 15.18	
	2 to 5 Years	43	63.89 ± 23.74	
	5 to 10 Years	18	68.33 ± 19.98	
	10 Years & Above	7	73.92 ± 16.69	
Monthly Average Income	Less Than RM1,499	2	85.00 ± 0.00	3.9096E-14
	RM1,500 -RM2,999	68	53.82 ± 16.15	
	RM3,000 -RM3,999	14	81.42 ± 12.54	
	RM4,000 -RM4,999	12	88.75 ± 11.15	
	RM5,000 -RM5,999	2	91.25 ± 5.30	
	RM6,000 and Above	2	100.00 ± 0.00	

One way ANOVA was used for department, position, year of service and monthly average income.

*Significant of $p < 0.01$ using One way ANOVA

Employees' attitude (Scale: Strongly Disagree/Slightly Disagree/Neutral/Slightly Agree/Strongly Agree) - min. score= 0; max. score= 100

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5.7 Specific Weak Areas of Employees' Towards Noise Pollution in Terms of Knowledge and Attitude

Based on the overall mean score of employees' knowledges towards noise pollution in latex glove manufacturing industry in Chapter 4, only 26% of the respondents are aware that hearing loss cannot be recovered to normal even when a person is no longer being exposed to loud noise. This, in turn will cause the employees to neglect the importance of prevention of hearing loss because they think noise induced hearing loss recoverable after sometimes (Metidieri et al., 2013). The second lowest score in terms of knowledge is question related to the cause of noise induced hearing loss (NIHL), which is hobbies like shooting and listening to loud music can cause deafness. In this question, only 35% of the respondents has answered correctly. This means that most of the respondents does not aware that their daily hobbies such as listening to load music using earphone could lead to NIHL. This case will continue to worsen as the day goes by, because hearing loss might not be noticeable until it is significant (Razman et al., 2008). Furthermore, 61% of the respondents have a false perception that noise induced hearing loss can be treated by medicine. This will also cause some of the employees to not take the loud noise in the manufacturing plant seriously during work until it has affected them (Razman et al., 2008).

Some of the weakest points in terms of attitude of employees towards noise pollution is their health seeking attitude and risk-taking attitude. Roughly about 43.40% of the employees think that NIHL can be treated by using traditional medicine. However, there were no previous study that prove there is any traditional medicine are able to recover NIHL. Besides that, there are 39.60% from the total respondents are willingly to take the risk of NIHL as they behave in such that noise in the workplace is a common occurrence to them.

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However, when compared, the overall mean score of attitudes of employees higher than the mean score of knowledge towards noise pollution. This situation can be deduced that although most of the foreign employees does not gone through formal education, but once they started working in the latex glove manufacturing plant, enforcement and practical training are being provided by the employers on a regular basis. Therefore, the foreign employees have to follow and comply with the requirement of prevention of NIHL whether it is voluntarily or involuntarily.

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CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The purpose of this study is to explore the employees' knowledge and attitude towards noise pollution in latex glove manufacturing industry. The main objective for this study is to determine the level of employees' knowledge and attitude towards noise pollution in latex glove manufacturing industry and to compare the knowledge and attitude of employees towards noise pollution with socio-demographic and working profiles.

The first objective is to determine the level of employees' knowledge towards noise pollution in latex glove manufacturing industry. Questionnaire survey has been given to 100 respondents from different department to test for their knowledge. Results shows that the employees have very low knowledge and awareness towards noise pollution in the latex glove manufacturing industry. There were only 32% of the total respondents have passed the knowledge test from the questionnaire survey, whereas the rest of the respondents have scored lower than 75% from the knowledge test. Some of the weak areas in terms of knowledge are the prevention knowledge and cause of NIHL knowledge.

The second objective is to determine the employees' attitude towards noise pollution in latex glove manufacturing industry. Results shows that overall mean score of the respondents is 64.18%, which is higher when compared to the mean score of knowledge (43.62%). This is mainly due to the proper enforcement by the employers and there is also effective practical training provided on a regular basis to the employees. However, some of the weak areas for the overall respondents in terms of attitude towards noise pollution is their health seeking attitude and risk-taking attitude.

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The third objective of this study is to compare the knowledge and attitude of employees towards noise pollution with socio-demographic and working profiles. One Way ANOVA test was conducted to analyse the significant difference of the employee's knowledge and attitude towards noise pollution with their socio-demographic and working profiles. It was found that the nationality, education level and the department of the employees will affect how well is their knowledge and their attitude towards noise pollution. The p-value of nationality when compared to their knowledge level is 7.406E-22 and for attitude is 1.2914E-16. Besides that, the p-value of education level is 1.6506E-23 for knowledge and 4.4487E-17 for attitude. Lastly, the p-value of department is 2.8906E-9 for knowledge and 4.1447E-9 for attitude.

Therefore, we are able to conclude that all the objectives of this research project have been met.

6.2 Recommendation for Improvements

Based on the overall findings from this study, the employees are having better attitude when compared to their knowledge towards noise pollution. This means that they are more than willingly to follow orders and enforcement by the employers to wear personal hearing protectors in the manufacturing plant while they are working. Nonetheless, when they are off from working, they might be having some hobbies like listening to music at a very loud volume because there is no enforcement and due to lack of knowledge towards noise pollution. Therefore, theoretical educational programmes on general prospects of noise pollution and prevention of noise induced hearing loss shall be provided more often to the employees. Furthermore, post-test shall be given to them in order to test their understanding and effectiveness of the educational programmes. This will definitely improve the overall knowledge and attitude of the employees towards noise pollution in latex glove manufacturing industry.

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6.3 Recommendations for Future Work and Limitation

Some of the recommendation could be useful for future study as this study does not include the noise risk assessment of the latex glove manufacturing plant. Besides that, audiometry test for the respondents can also be added into the research design so that the audiometry test result can be related to their attitude more accurately.

Furthermore, this study was conducted in Meru, Klang and so it does not necessary reflect the knowledge and attitudes of the employees in other cities of Malaysia. Therefore, the location of future study can also include location from other cities in Malaysia.

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