

Safety and Health Problems in the Small and Medium Scale Metal Fabrication Enterprises in Willowvale Industrial Area In Harare, Zimbabwe

¹Gwezuva Norman , ²Jerie Steven

¹Occupational Safety and Health Department National Social Security Authority of Zimbabwe Harare, Zimbabwe

²Department of Geography and Environmental Studies Faculty of Social Sciences Midlands State University P. Bag 9055 Gweru, Zimbabwe

ABSTRACT: The objectives of this study were to identify the types of small and medium scale metal fabricating enterprises operating in Willowvale and to assess the existing hazards in these enterprises so as to analyse the effectiveness of the occupational safety and health management practices being implemented. The study used both quantitative and qualitative approaches with the research subjects being selected using stratified random sampling and purposive sampling methods. Questionnaires, interviews, observations and occupational hygiene measurements were used in data collection. The analysis of the collected data through the use of SPSS version 11.5 and Microsoft Excel 2007 revealed that the majority of small and medium scale metal fabricating enterprises were operating outside the requirements of the Zimbabwean OSH laws and regulations by failing to have their premises registered under the Factories and Works Act. OSH management structures were virtually non-existent and the implementation of OSH programs was predictably poor and minimal. Employees were exposed to numerous workplace hazards in the form of excessive noise, heat stress, hazardous metal working chemicals, awkward work postures to name just but a few. In conclusion, several recommendations to improve the state of OSH in this economic sector were proposed. These included tailor made and deliberate interventions being required from the regulatory authorities where the main thrust of such interventions will be on awareness and training campaigns so as to develop and cultivate the necessary skills, knowledge and attitudes toward sustainable OSH practices in metal fabricating SMEs.

KEY TERMS: enterprises, hazards, metal fabrication, occupational safety and health, small and medium scale

I. INTRODUCTION

This study analyses the occupational safety and health problems associated with small and medium scale metal fabricating enterprises in the Willowvale industrial area of Harare, Zimbabwe. It identifies the types of small and medium scale metal fabricating enterprises operating in Willowvale industrial area and examines occupational safety and health hazards in the metal fabricating small and medium enterprises (SMEs.). The study also explores the effectiveness of the current occupational safety and health management practises being implemented. The study also proposes recommendations to the sector, government and other relevant authorities seized with the development and implementation of occupational safety and health policies in Zimbabwe. Nevertheless, many workers globally still face unsafe and unhealthy working conditions and the recent economic crisis and recession have also threatened to undermine these achievements. Some categories of workers such as migrants, temporary workers and those in the informal, small and medium scale operations are facing more dramatic consequences of this situation (Chikova 2011, Ghoshal 2000, Mmasi and Mwenisongole 2012, Moyo 2017, Puplamptu and Quarterly 2012, Thurik 2001, Work Safety and Health 2016). It was therefore very timely that the Seoul Declaration on Safety and Health at Work was adopted in June 2008 during the XVIII World Congress, committing its signatories to “taking a lead in promoting a preventative safety and health culture and placing occupational safety and health high on national agendas” (ILO Seoul Declaration, 2008). Importantly, for the first time in an international declaration, the Seoul Declaration stated that the right to a safe and healthy working environment should be recognized as a fundamental human right and that promoting high levels of safety and health at work is the responsibility of society as a whole (ILO Seoul Declaration, 2008). The International Labour Organisation (ILO) reports that occupational accidents and diseases remains one of the most appalling human tragedy of modern industry and one of serious forms of economic waste.

The organization estimates that at least 250 million occupational accidents occur every year worldwide and 335,000 of these accidents are fatal. An estimated 160 million people worldwide have work related diseases. In one third of these cases, the illness causes the loss of 4 or more working days. However since many countries do not have accurate record-keeping and reporting mechanisms, it can be assumed that the real figures are much higher than this (ILO Report, 2011). Zimbabwe has experienced a steady rise in the number of occupational deaths, injuries and diseases. According to records maintained by NSSA which is the regulatory authority on OSH issues in Zimbabwe, an abstract of the past 5 years shows that in 2009, the country recorded 3122 serious accidents of which 64 were fatal, in 2010, 4410 accidents that resulted in 90 deaths were reported. The year 2011 saw a marginal decline in work related accidents with 4158 accidents and 75 fatalities being recorded. In 2012, 5141 accidents were reported with 107 work related deaths being recorded. In 2013, the country recorded 5666 work related accidents and 76 deaths. In an economy operating at below half of its capacity, the continued upward trend in accident statistics is unacceptable. However since the use of absolute figures in OSH statistics does not show a complete picture, in terms of lost time injury frequency rate (LTIFR), the country has had injury frequency rates of 1.18 in 2009, 1.67 in 2010, 1.56 in 2011, 1.93 in 2012 and 2.34 in 2013 against the international standard of less than 1 (NSSA OSH Annual Reports (2009 – 2013)). It has however been noted that most of the recorded occupational accidents are from the small and medium scale enterprises when compared to the well-established industries.

In Zimbabwe the economic meltdown that affected the country since the introduction of economic structural adjustment programme (ESAP) and the turn of the millennium, has resulted in the cropping up of SMEs in every growth point, suburb and town in Zimbabwe. According to the Small and Medium Enterprises Association of Zimbabwe (SMEAZ) (2012), small enterprises are those operations that has a turnover of less than US\$240 000 or assets less than US\$100 000. Medium enterprises has assets above those of small enterprises, but less than US \$1 million. Many Zimbabweans including the government, recognise that SMEs constitute a key element of the economy. This has been shown by the creation of the Ministry of Small and Medium Enterprises and Cooperative Development and institutions such as Small Enterprise Development Corporation (SEDCO) to help with the policy and funding mechanism for the sector. A survey conducted by the Finmark Trust aided by the Ministry of SMEs, supported by World Bank and the Zimbabwe Multi Donor Trust Fund revealed that Zimbabwe has 3.5 million micro, small and medium sized enterprises, with an estimated turnover of US\$7.4 billion in 2012. These enterprises are owned by 2.8 million Zimbabweans, providing employment (exclusive of owners) for 2.9 million people, which results in 5.7 million (owners and employees) attaining livelihood from their operations (Zimbabwe Independent – June 28 to July 4, 2013 : Eric Bloch Column).

Although SMEs play a significant socio-economic role in Zimbabwe and the world over, the sector is riddled with a myriad of occupational safety and health challenges. The European Agency for Safety and Health at Work (2011), outlined that despite their pivotal role in employment creation, it is sad to note that their occupational safety and health record, does not compare well with larger enterprises. The Agency highlighted that in Europe, the fatal accident rate in SMEs is usually double that of larger enterprises. This being partly because the sector is mainly under or inadequately regulated, which is compounded by limited enforcement of the existing regulations since more often than not inspectors from the regulatory authorities such as Local Authorities and National Social Security Authority (NSSA) in the case of Zimbabwe are thin on the ground. Currently NSSA has a total of 30 inspectors for the whole of Zimbabwe of which 12 of them are dedicated to cover Harare Region which includes Harare metropolitan province, the whole of Harare, Mashonaland East and Central provinces.

According to Mudavanhu *et al.* (2013), the Zimbabwean SMEs sector faces a major challenge that, instead of working towards becoming part of the formal economy, the sector prefers to remain part of the unregulated economic sector due to the perceived advantages like non-payment of statutory fees and taxes and non-subscription to any existing occupational safety and health regulations. It is recognised that the metal fabrication sector is among some of the most hazardous working environments after the small scale underground mining, quarrying, agriculture and construction. The sector is also characterised by poor coverage of inspection, welfare, information, medical and emergency services (Chikova 2011, Nules 2016.). Most factories in the SME sector do not have any records and registers of work related injuries and illnesses, let alone any programmes to prevent these injuries or diseases. There is therefore imprecise and gross underestimation of occupational accidents and disease burden in this sector. This is particularly true on occupational diseases since occupational accidents and injuries are more readily identifiable at the moment they occur, whilst occupational diseases tend to be of slow onset and require a relatively long period of time to track and monitor and at time expensive specialised medical diagnosis which is rarely considered in most small enterprises. The management of a potential huge occupationally related disease burden and long-term loss of vital human capital from unhealthy workplaces is bound to pose a formidable challenge for government and society at large if proactive occupational safety and health practices are not adopted in the SME sector as a matter of urgency.

Data from the National Social Security Authority of Zimbabwe (NSSA) Annual Statistical Report of 2009 showed that there were 11 713 employees in the basic metal production while 36 519 workers were employed in the fabricated metal production areas, suggesting that there could be perhaps more active small to medium size establishments dealing with metal production and metal fabrication. The annual statistic reports have shown that for the period 2004 to 2009 injury statistics have been quite significant in the basic metal production and metal fabrication establishments. These injury statistics require a critical analysis of their causative agents and suggestions on what measures of interventions can be instituted to reduce and/or eliminate these disabling occupational accidents. An average number of occupational injuries for the 6 years period 2004 – 2009 indicated that basic metal production experienced an average of 633 injuries per year, metal fabrication 556, mining and quarrying 648, wood production 302, transport and storage 481 and agriculture 553 per year. Injury frequency rate (which is an indicator of how safe and healthy workplaces are), is quite high in metal fabrication industrial sector compared to those prevailing in mining, transport and storage, forestry and agriculture except for wood and wood products industrial sectors. According to NSSA Annual Statistical Reports, basic metal production show an average injury frequency rate of 26.4 while that for the metal fabrication averaged 6 for the 6 year period. The basic metal production industries lead in causing accidents while the metal fabrication industries take a third place in contributing to accidents after wood and wood products industrial sector which has an injury frequency rate of 6.7. But quite clearly metal production and metal fabrication industries show that these two sectors are key drivers of occupational accidents in industry compared to other key high risk sectors such as mining averaged 5.6, transport and storage averaged 4.9 and agriculture averaged 1.2.

This data although indicative of the magnitude of the OSH problem existing in the metal fabrication industry, there is nothing specifically on the small and medium enterprises since the data is all encompassing and is based on the compensation system, where only those injuries reported for compensation at NSSA are the only ones reflected. The problem has been further compounded by the fact that although small and medium enterprises are covered under the Factories and Works Act as envisaged in the definition of a factory (any premises on which any person performs work in connection with making of any articles or part of an article; the altering, repairing, renovating, spraying polishing, washing or breaking up of any article (metal fabrication)). The sector is rarely covered by NSSA OSH personnel in terms of OSH inspections and awareness campaigns, such that most of them have gone for more than 5 years without interacting with any NSSA OSH inspectors.

II. LITERATURE REVIEW

Small and medium scale enterprises (SMEs) constitute the fastest growing economic sector both in the developed and developing world. According to the European Agency for Safety and Health at Work (2011), SMEs are widely acknowledged as the backbone of the European economy since they employ nearly two thirds of the European Union's private sector workforce and creating one in every two new jobs. Seneviratne and Phoon (2005), highlighted that in Australia, SMEs are a key sector in the country's economy since at the turn of the 21st century, SMEs were employing a total of nearly 3 million people which then was over half of all private sector employees in Australia. Japan has been a world model of a progressive and stable world economic powerhouse that has exhibited and capitalised on the benefits associated with SMEs. Without looking at a cocktail of factors that are at play in different economies, existing statistics indicate that SMEs constitute 98% of all enterprises in Japan and account for 70% of employment.

The dawn of occupational safety and health (OSH) as a discipline marked a new era in the employment sector as many countries have realized its importance and the need to give higher priority to preventing accidents and ill-health at work (Alli 2008, ILO 2006, Moyo 2017, Moyo 2015, Work Safety and Health 2016, Safety Line Institute 2009, Solaja and Oludele 2014). Thus an unprecedented amount of information about occupational risks and how to manage them is now available, much of it on-line and OSH appears to be better managed in many enterprises. Such advances have been driven partly by greater expectations of the need for Decent Work and partly by a growing acceptance of the heavy burdens that unsafe and unhealthy working conditions impose on human health, well-being, productivity, employment and the economy as a whole. Many governments the world over and indeed the government of Zimbabwe have established occupational safety and health regulations and standards, and have undertaken significant actions through awareness and enforcement activities meant to guard against the entirely preventable tragedies of occupational death, disease and disability. Policy makers who have been confronted with growing concerns about the increases in unemployment, lack of job creation, poor economic growth and globalization believe that entrepreneurship is the solution to these concerns (Thurik (2001)). The assertion has been supported by Storey (2000) who pointed out that politicians around the globe have over the past decade emphasized the importance of small enterprises as mechanisms for job creation, innovation and the long term growth and development of economies. According to Mmasi and Mwenisongole (2012), there are a number of terms used when referring to a small business.

These include the term Small Medium and Micro sized enterprise (SMME) as in the case of South Africa; Small to Medium sized enterprise (SME) and the generic term, small business or small firm. This study focused on SMEs since they are regarded as the ones with the potential for job creation and making substantial economic contribution to Zimbabwe in line with the country's latest economic blueprint dubbed Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZIMASSET).

In a discussion on small business performance Westhead *et al.* (1996) as quoted by Mmasi and Mwenisongole (2012) stated that, the small firm is not a scaled down version of a large enterprise. In short, theories relating to SMEs must consider the motivations, constraints and uncertainties facing small enterprises and recognize that these differ from those facing large enterprises. The author noted that small business is one in which one or two people are required to make all of the critical decisions such as personnel, production, marketing and selling decisions without the aid of employed specialists, with owner(s) only having specific knowledge in one or two functional areas of management.

There are a number of definitions of what forms a small and medium enterprise. Some of the definitions are based on quantitative measures such as staffing levels, turnover or assets, while others employ a qualitative approach. Meredith (1994) as quoted in Mmasi and Mwenisongole (2012) suggested that any description or definition must include a quantitative component such as number of employees, turnover, and assets in combination with qualitative components on how the enterprise operates. Although there are more than 50 different definitions in 75 countries (Mmasi and Mwenisongole (2012)), in the context of Zimbabwe, SME is a term used to refer to small and medium sized enterprises in non-farming activities, that include manufacturing, mining, commerce and services. According to the Small and Medium Enterprises Association of Zimbabwe (SMEAZ) (2012), small enterprises are those operations that has a turnover of less than US\$240 000 or assets less than US\$100 000. A medium enterprise has assets above those of small enterprises, but less than US \$1 million. However since the definition only spell out the revenue / turnover and the asset base, but comes short on the staffing levels, the study used an enterprise with employees ranging from 2 to 50 including management that is legally recognized in Zimbabwe through a certificate of incorporation in addition to the former financial perspectives to be an SME.

According to the ILO Report (2007), small and medium scale enterprises (SMEs) comprises half to three-quarters of all non-agricultural employment in developing countries and involves more than 80% of the working population as a whole. Although it is difficult to generalize on the quality of employment conditions in this economic sector, it is often associated with poor working conditions and poverty, as evidenced by:-

- Regular late and at time non-payment of wages
- Excessive long working hours
- Retrenchment without official notices
- Unsafe and unhealthy working conditions
- Absence of social benefits such as retirement pensions and health insurance.

The ILO (2010) pointed out that the majority of SME workers are not registered, regulated or protected under existing labour laws particularly in developing countries such as Zimbabwe. They have little access to OSH advice and information and do not have the necessary awareness technical means and resources to implement proactive OSH intervention measures.

According to Hasle *et al.* (2012), it is generally accepted that small enterprises with less than 50 employees have higher exposure to occupational hazards than larger organizations. The sentiments were supported by Hızıroğlu *et al* (2012) who noted that according to a research conducted by the ILO, the ratios of occupational accidents decreased as the companies become larger and the figures associated with workplace accidents are higher for SMEs. This generalization that was proved by other international statistics and reports can be considered to be valid for Zimbabwe, since in the current literature there are very few studies related to a detailed examination of SMEs in Zimbabwe. The assertion was reinforced by Mudavanhu *et al* (2013) who pointed out that small firms in developing countries have received very little attention from OSH researchers. Lack of publications on SMEs in Zimbabwe makes compliance to occupational safety and health legislation and standards difficult to assess. Furthermore Mudavanhu *et al* (2013) highlighted that the current efforts and respective tools in occupational safety and health development are best suited for large enterprises, when in fact they are outnumbered by SMEs. Small enterprises often have limited resources to prioritize these risks and to improve the working environment and they often have difficulties in complying with legislation. Furthermore, it seems that regulations, controls and campaigns aiming at improving the working environment in small enterprises only have limited effect. The most important reason for this challenge is the cost of reaching out and engaging with small enterprises, both for different stakeholders such as labour inspectors, factory inspectors and advisory services. Small enterprises constitute a major challenge for the society's effort to improve occupational safety and health as they on one hand, have extensive needs and on the other hand are difficult to reach (Hasle *et al* (2012)).

According to Mudavanhu *et al* (2013) lack of skills and resources has resulted in the SME sector depending primarily on the knowledge of the director or owner rather than through written rules, regulations, procedures and standards; and they are not fully aware of the advantages that can accrue to them by implementing sound occupational safety and health programs alongside their business operations. The risks are worsened by challenges they face such as survival pressure and lack of management motivation. It has also been established that smaller enterprises have less perception of occupational safety and health risks. This has led SMEs to be generally perceived as lacking a sense of commitment to the extent of being outrightly safety and environmental irresponsible. Rao *et al* (2006) and Seiffert (2008) as quoted by Mudavanhu *et al* (2013) agreed that, SMEs are known to take up occupational safety and health and sustainable environmental management measures only in response to threats of imposed penalties or closure by government or regulatory authorities. The same author pointed out that the other major challenge pertaining to the operation of most SMEs is their known short life spans. Short life cycles thwarts occupational safety and health surveillance and interventions as efforts must be continuously renewed as new enterprises emerge. In most cases, at any time most of them are new and are not familiar with relevant safety and health regulations and practices.

III. METHODOLOGY

This study employed a cross sectional survey that used both quantitative (positivist) and qualitative (phenomenological or interpretivist) approaches. Saunders *et al* (2009) and Bryman (1988) as quoted by Chikova (2011) stated that positivism assumes the role of an objective analyst who makes independent interpretations on data that has been collected in a personal opinion free manner. According to the NSSA Employers' Register there are a total of 108 metal fabricating SMEs recorded in Willowvale (those enterprises with 1 – 50 employees including management). Since Harare City Council and the Small and Medium Enterprises Association of Zimbabwe (SMEAZ) did not have any database of the existing metal fabricating enterprises in Willowvale, the NSSA Employers' Register figure of 108 was used as the working population for this study. This was also justifiable because the operating scope of the NSSA Contributions and Compliance Section involved in the collection of revenue from employees is wider when compared to other NSSA Sections such as the Factories Inspectorate, since the NSSA Contributions and Compliance Inspectors goes beyond the scope and limitations of the Factories and Works Act and the Pneumoconiosis Act which are the two principal OSH laws enforced by the Factories Inspectors of NSSA. The study selected a sample of 56 small and medium scale metal fabricating industries in Willowvale industrial area.

This study employed both probability and non-probability sampling methods to select samples depending on the type of data required. In terms of non-probability sampling, the purposive sampling method was employed. Purposive sampling involves selecting members from the population to comprise a sample because they specifically meet some prescribed purpose or possess specific attributes of interest that address the purpose of a particular research problem under investigation. This method was used to select key informant interview respondents such as Harare City Health Environmental Health Officers, NSSA Inspectorate and Promotions Officers, ZCTU Representatives and Small and Medium Enterprises Association of Zimbabwe (SMEAZ) Chairperson. The proportionate, stratified random sampling was used in the selection of the SMEs sample. The number of SMEs per stratum was determined through simple proportion of the stratum size divided by the SME population size multiplied by the sample size. The metal fabricating SMEs in Willowvale were categorised into three different stratus namely:-

- Industrial metal fabrication, where equipment is manufactured for industrial use.
- Structural metal fabrication that involves the development of metal structures used for construction purposes e.g. window and door frames, steel bars etc.
- Commercial metal fabrication that entails the production of general finished products and services such as pots, panel beating etc.

Table 1 Distribution of Sampled SMEs by Nature of their Operations

Types of Enterprises	Population	Sample Size
Industrial Fabrication	19	10
Structural Fabrication	38	20
Commercial Fabrication	51	26
Total	108	56

The owners and or managers of these metal fabricating SMEs were purposively sampled, whilst the employees were randomly sampled at each selected enterprise. It must be noted that of the 56 sampled enterprises, occupational hygiene measurements of noise, light and heat stress were carried out at different several points within each enterprise so as to come up with the average prevailing situation and the worst case scenario for each measured parameter. The same applied to employee questionnaires which were administered to more than one employee representative for the industrial and structural metal fabrication operations due to their relatively bigger workforce when compared to their counterparts under the commercial metal fabrication type.

Three key parameters relevant to metal fabricating SMEs namely noise, light and thermal stress were measured. The Quest Technologies Precision Integrating Sound Level Meter Model 1900 together with the Quest Technologies Sound Level Calibrator Model QC-10. The Sound Level Meter was calibrated to the recommended level of 114 dB(A) before and rechecked after measurements. The Sound Level Meter Calibrator had a valid reference calibration certificate from the National Metrology Institute.

The TES Digital Illuminance Meter Model 1330A was used to measure light intensity. The Lux Meter was zeroed before and after measurement by ensuring zero reading when there is virtually no light exposure to the light sensor. The Lux Meter had a valid reference calibration certificate from the National Metrology Institute. The illumination measurements were done at different work areas at a height of about 1.2 metres with the Lux Meter held at arm's length in a horizontal position. The QUESTemp 32 Heat Stress Monitor was used to measure heat stress and ISO 7243 Metabolic Rates Classification Chart. The Heat Stress Monitor was calibrated by the National Metrology Institute, with a valid reference calibration certificate. The Heat Stress Monitor was mounted at a height of 1.2 meters from the ground at each of the workstations to be assessed and the readings were taken after 15 minutes.

Apart from the occupational hygiene measurements, self-administered structured questionnaires were used to solicit for qualitative data from employees and owners/managers of SMEs. The employee questions sought to determine the demographic data for the sampled employees, workplace hazards they encountered, how are being managed and what they think should be done to improve the situation. The employers on the other hand were asked on their operations, number of employees involved and their occupational safety and health programs in terms of hazard identification, OSH induction and training, issuance of personal protective clothing and equipment to name just but a few. Key informant interviews are qualitative in-depth interviews with people who know what is transpiring on the subject of interest. Face to face interviews were conducted with Harare City Health Environmental Health Officers, NSSA Inspectorate and Promotions Officers, ZCTU Representatives and Small and Medium Enterprises Association of Zimbabwe (SMEAZ) Chairperson. The interviews were meant to ensure that an in-depth understanding of occupational safety and health challenges affecting both SME employees and employers are discussed and understood from a tripartite perspective i.e the government represented by the regulatory bodies inform of NSSA and the Harare City Health Department; employers represented by SMEAZ and employees through ZCTU. Looking forward, the same were also pivotal in coming up with proposals on how from their different perspectives the spelt out problems could be addressed. Field studies were conducted at the same time when the researcher was carrying out occupational hygiene measurements. A checklist on general OSH requirements was developed from known legal requirements and best practice to ensure that all areas of interest were observed. The areas covered included general workplace environment outlook, housekeeping, signage, ppc/e provision and use, premises registration license, sanitary facilities among other basic OSH requirements.

Secondary data was derived from review of existing literature such as OSH journals, textbooks, newspaper articles, internet and past research papers and documents. Previous researches were instrumental in assisting the researcher to identify knowledge gaps in terms of information and research methodologies which needed to be covered by this research. Further secondary data was gleaned from review of various workplace inspection and assessment records and reports from institutions such as NSSA. Records on enterprise registration and OSH performance were carefully selected and studied so as to come up with a comparative analysis of the existing OSH performance against the expected best practices and legal requirements. Data was evaluated to establish trends and relationships over the defined period of 2013 up to April 2014. All quantitative data was fed into the Statistical Package for Social Scientists (SPSS) 11.5 and Microsoft Excel 2007 programs for processing, analysis and interpretation. Qualitative data was analysed according to source e.g owner/managers, employees etc. Findings were presented in pictorial forms such as tables, bar graphs, line graphs among other form of graphical presentation.

IV. RESULTS AND DISCUSSION

4.1 Occupational hazards associated with the small and medium scale metal fabrication enterprises in Willowvale Industrial area

Table 2: OSH hazards Identified by Metal Fabricating SMEs Employers

	Frequency	Percent	Valid Percent	Cumulative Percent
Poor electrical installation	12	8.1	8.1	100.0
Gas cylinder	6	4.1	4.1	100.0
Sharp metal	22	14.9	14.9	100.0
Lathe Machine	7	4.7	4.7	100.0
Dust	17	11.5	11.5	100.0
Noise	21	14.2	14.2	100.0
Fumes and vapours	12	8.1	8.1	100.0
Grinding machine	14	9.5	9.5	100.0
Sparks / Fragments	17	11.5	11.5	100.0
Excessive heat	10	6.8	6.8	100.0
Chemicals	8	5.4	5.4	100.0
Light from welding	2	1.4	1.4	100.0
Total	148	100.0	100.0	

Employees are exposed to a range of physical hazards including sharp metal objects that was ranked first with 14.9% of the respondents taking note of it, noise that was noted by 14.2% of the respondents. Other physical hazards noted included heat stress, ultraviolet radiation from welding and sparks and fragments during welding, grinding and cutting operations. Apart from these physical hazards, employees were exposed to a wide range of hazardous chemical substances. These included paint vapours, paint removers and paint thinners that were noted from field observation and interview responses by the regulatory authorities such as NSSA and Harare City Health Department. Dry abrasion of paints from old cars exposed employees to paint and metal dust. Furthermore employees were exposed to metal dust and fumes during welding, cutting and grinding operations. The use of energised equipment and machinery resulted in 8.1% of the respondents noting electricity as a hazard, this was mainly due to the rampant existence of poorly connected electrical installations without the use of competent personnel to assist with the necessary connections and maintenance of electrical installations. The lathe and grinding machines were noted as the major machinery hazards with 4.7 and 9.5 percentage ratings respectively. The same hazards were noted by the SME owners or managers though with some additions and variations in terms of their percentage ratings as demonstrated in Table 3.

Table 3: Occupational safety and health hazards based on employers' responses

	Frequency	Valid Percent	Cumulative Percent
Poor Electrical installations	10	6.0	6.0
Sharp metal objects	15	9.0	9.0
Lathe Machine	3	1.8	1.8
Dust	13	7.8	7.8
Noise	29	17.4	17.4
Ultraviolet radiation	18	10.8	10.8
Fumes and vapours	14	8.4	8.4
Grinding machine	8	4.8	4.8
Sparks / Fragments	21	12.6	12.6
Excessive heat	6	3.6	3.6
Chemicals	5	3.0	3.0
Gas cylinders	4	2.4	2.4
Poor housekeeping	4	2.4	2.4
Inadequate ppe/c	2	1.2	1.2
Use of high voltage electricity	1	0.6	0.6
Use of improvised tools	1	0.6	0.6
Metal cleaning solvents	5	3.0	3.0
Heavy objects	8	4.8	4.8
Total	167	100.0	100.0

Noise was the major workplace hazard with 17.4% of the respondents taking note of it. 10.8 and 12.6% of the respondents indicated that employees in small scale metal fabrication operations would be exposed to ultraviolet radiation and sparks due to rampant welding, cutting and grinding operations in their day to day duties. When asked about what was being done to contain the existing workplace hazards, 52 employees who amounted to 85.2% of the 61 employees who completed that section of the questionnaire as shown in Table 5, indicated that they were using personal protective clothing. However in as much as that was the case it is important to note that in all premises visited one of the major challenges noted was of the provision of inadequate PPE/C as employees would have overalls but without ear plugs and safety shoes. Some of the provided PPE/C was worn out such it was no longer saving its intended purpose hence giving a false sense of protection to the exposed employee. Combining both employees and employers' responses and the researcher's field observations and hygiene measurements, the following were noted as the major existing OSH hazards in the metal fabricating SMEs in Willowvale.

4.2 Exposure to excessive noise levels

The noise measurement revealed that generally industrial metal fabricating small and medium scale enterprises had more operating noise above 90dB(A) as evidenced by 50% of the sampled enterprises recording noise levels above 90dB(A) per 8 hour working shift, followed by the commercial metal fabrication enterprises with 19.2% of the enterprises and lastly structural fabrication with 10% of their enterprises exposing their employees to above 90dB(A) average noise levels as shown in Table 4.

Table 4: Mean Noise Level of Measurement (A) Grouped

Sector of operation	Mean value of measurement A (grouped)			
	LESS THAN 85 dB(A)	85 dB(A) TO LESS THAN 90 dB(A)	90 dB(A) OR MORE	Total
COMMERCIAL FABRICATION	15	6	5	26
INDUSTRIAL FABRICATION	0	5	5	10
STRUCTURAL FABRICATION	10	8	2	20
Total	25	19	12	56

However, in terms of the worst case scenario i.e Measurement B, industrial metal fabrication remained on top with 100% of the sampled SMEs generating more than 90dB(A), followed by the structural enterprises with 70% of the enterprises and lastly commercial metal fabricating SMEs with 42.3% of the enterprises above 90dB(A) as shown in Table 5.

Table 5: Noise Level of Measurement (B) Grouped

Sector of operation	Mean value of measurement B (grouped)			
	LESS THAN 85 dB(A)	85 dB(A) TO LESS THAN 90 dB(A)	90 dB(A) OR MORE	Total
COMMERCIAL FABRICATION	0	15	11	26
INDUSTRIAL FABRICATION	0	0	10	10
STRUCTURAL FABRICATION	0	6	14	20
Total	0	21	35	56

The possibility of developing noise induced hearing loss is real across all types of small and medium scale metal fabricating industries as shown by the separated noise measurement results across the above three types of metal fabricating enterprises.

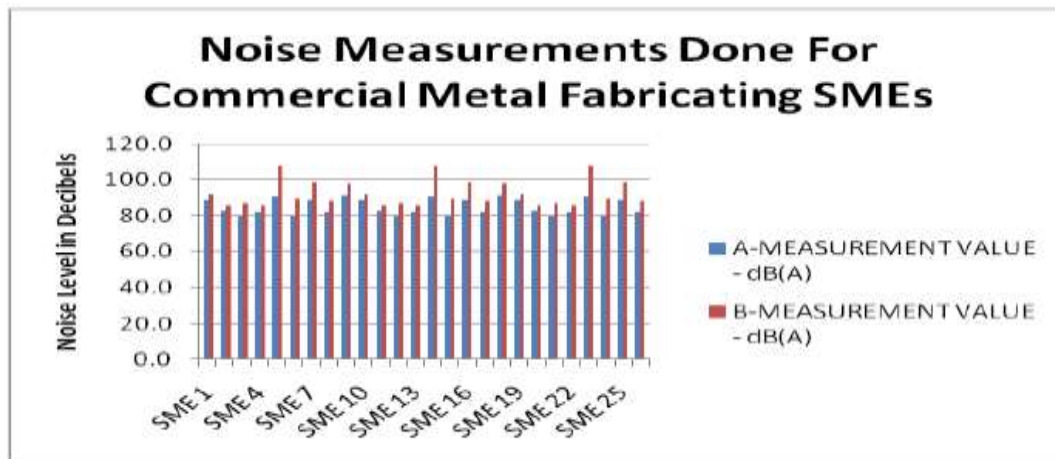


Figure 1: A and B Noise Measurement Results for Commercial Fabricating Enterprises

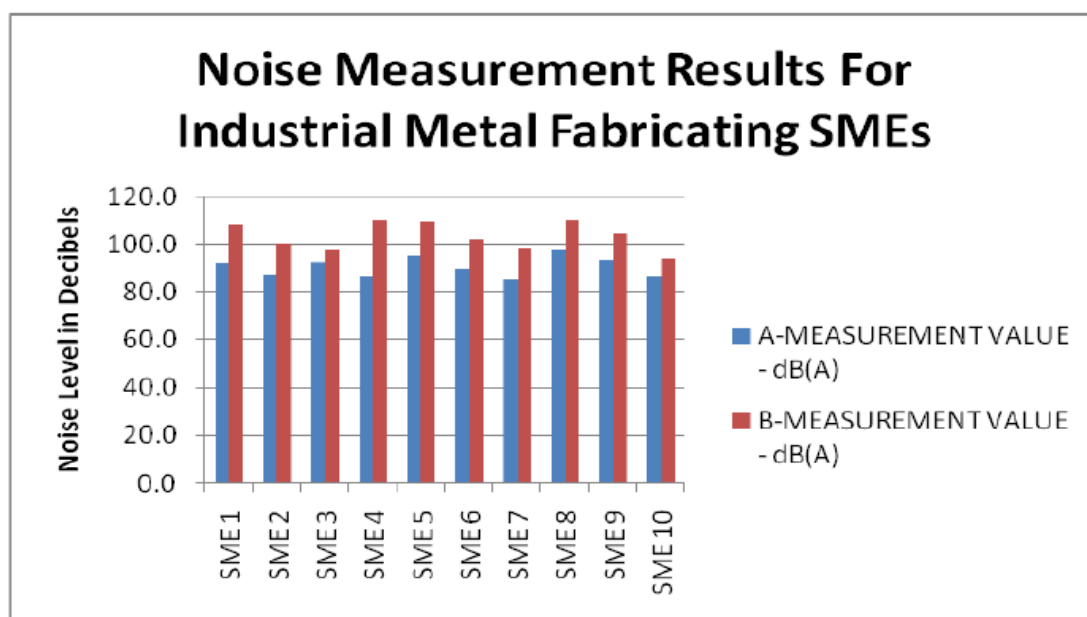


Figure 2: A and B Noise Measurement Results for Industrial Fabricating Enterprises

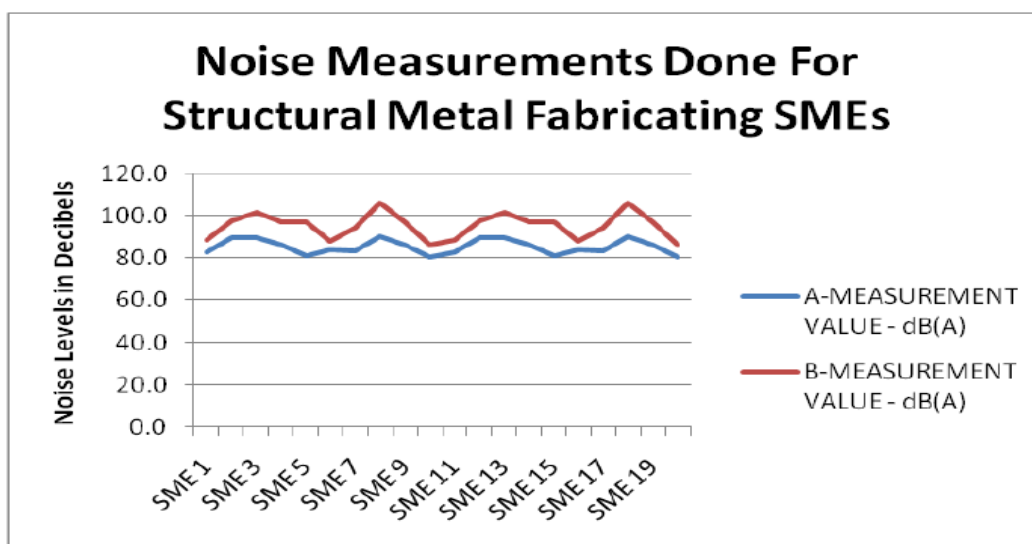


Figure 3: A and B Noise Measurement Results for Structural Fabricating Enterprises

According to the Factories and Works Act Chapter 14:08 of 1996 and supporting Regulations, “no person shall be exposed to noise in excess of 90dB (A) for an eight hour shift without putting on hearing protective devices”. However, internationally, 85dB (A) is recommended as the “safe” limit for a similar duration. Looking at the average noise levels recorded across all types of metal fabricating SMEs as shown in table 4.11, one can note that only 25 (44.6%) had an average noise level below 85dB(A) as demonstrated by the results of Measurement A. However when considering the highest noise source per each enterprise as shown by Measurement B, none had noise levels below 85dB(A), only 21 (37.5%) had noise levels in the ranges of 85 and 90dB(A). This shows that probability of developing noise induced hearing loss (NIHL) for most employees in the metal fabricating SMEs within Willowvale industrial area is not a myth but a reality. However this is a sad picture since NIHL is not reversible and can lead to other different forms of work related accidents due to poor hearing.

4.3 Welding hazards

The study revealed a number of welding hazards that varied from one metal fabricating enterprise to the other. However the most common welding hazards recorded by both employee and management respondents included ultraviolet radiation that was noted by 2 (1.4%) employee respondents and 18 (10.8%) management respondents. Dangers associated with gas cylinders that are used in gas welding such as explosions were noted by 6 (4.1%) employee respondents and 14 (8.4%) management respondents. Fumes and vapours were outlined by 12 (8.1%) employee respondents and 21 (12.6%) management respondents. Last but not least were sparks and burns that were pin pointed by 11.5% of the employees. It must be noted that there was significant variation in terms of welding hazards prioritisation between sampled employees and SME owners/managers. The reason was mainly due to the lack of appreciation of most welding hazards by employees who more often than not, felt that exposure to hazards such as ultra violet radiation during welding was part of their work hence not appreciating as a hazard worth mentioning. Through field observations, in as much as most employees and SME owners/managers appreciated some welding risks, the problem was being aggravated by lack of adequate personal protective clothing and equipment in most enterprises e.g. although 80% of the enterprises were issuing welding goggles and face shield, none had welding screens, leather gloves, welding aprons and leggings.

4.4 Excessive heat

Despite being expressed as a metal fabricating SME hazard by 3.6% of the owners/managers and 6.8% of the employees respectively, in terms of heat stress measurements results obtained during the study, 29% of the measured work areas in commercial metal fabrication enterprises had heat stress outside the permissible range of 250C wet bulb globe temperature (WBGT) index for heavy work, 26.70C for moderate work and 300C for light work. The trend was maintained at 28% for structural metal fabricating SMEs. The problem was quite significant in the industrial metal fabricating SMEs where 48% of the measured areas showed that employees were being exposed to heat stress. The temperature index ranges was presented in graphical presentation as shown in Figure 6.

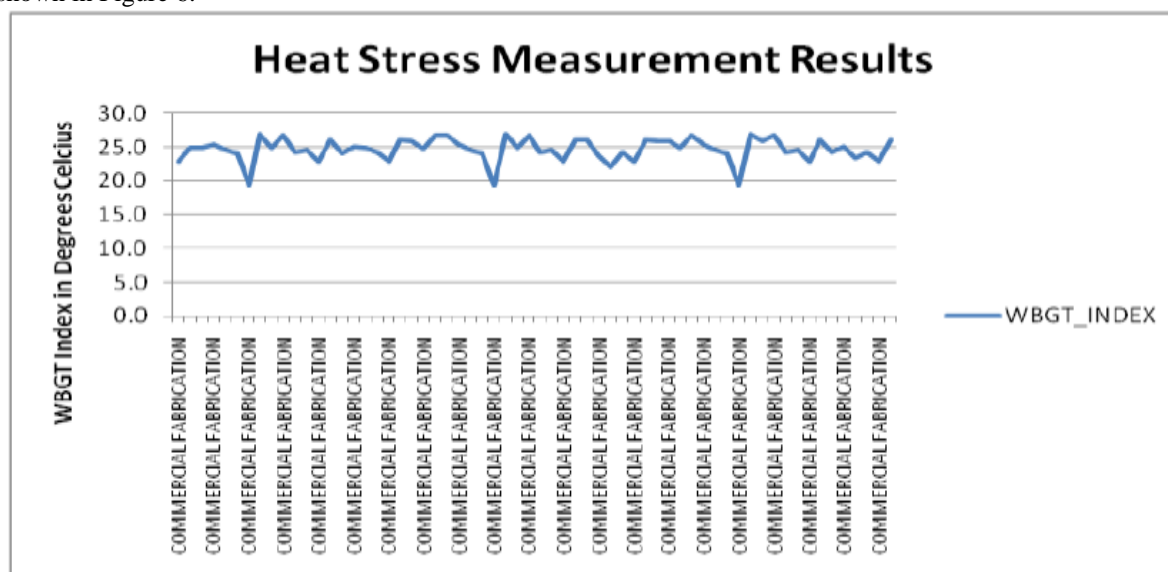


Figure 4: Heat Stress Measurement Results for Commercial Metal Fabricating SMEs

Acti

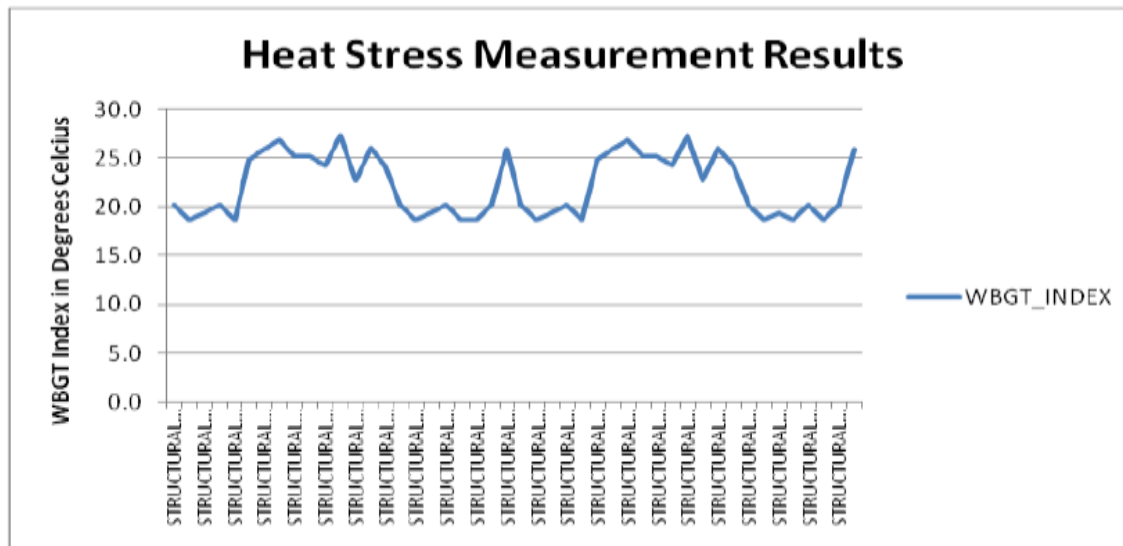


Figure 5: Heat Stress Measurement Results for Structural Metal Fabricating SMEs

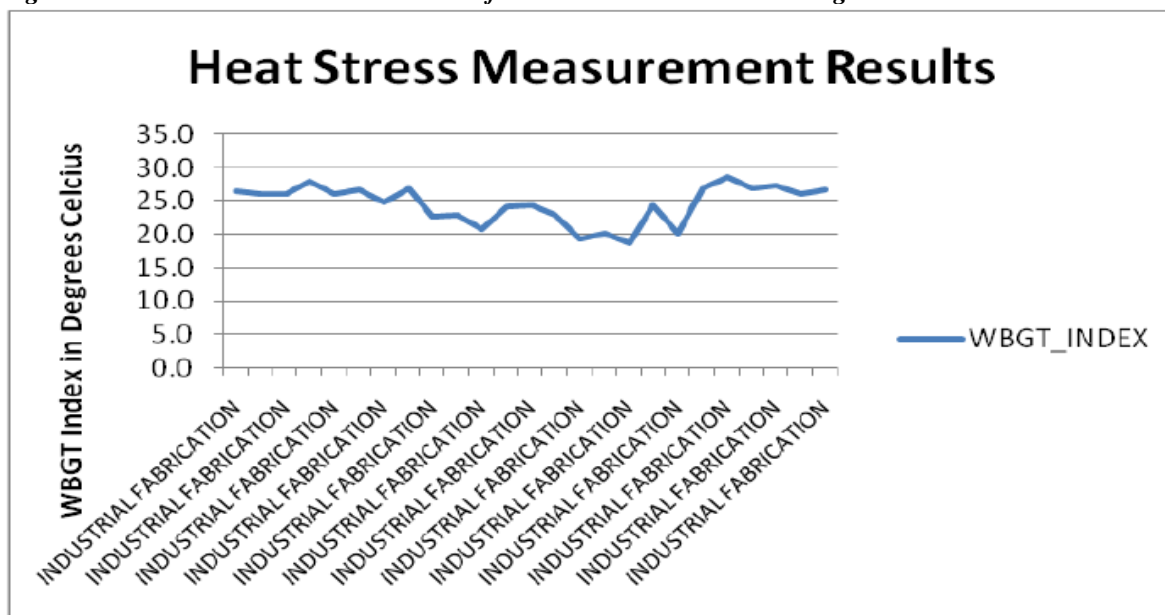


Figure 6: Heat Stress Measurement Results for Industrial Metal Fabricating SMEs

According to Judge (2003), heat stress is the physical and physiological reactions of the worker to hot temperatures that fall outside of the worker's normal comfort zone. The problem was quite significant in the industrial metal fabricating SMEs where 48% of the measured areas showed that employees were being exposed to heat stress. This may result in employees developing heat rash, heat fatigue and heat cramps. In the worst case scenario, an employee might develop heat stroke where the victim's body temperature regulation mechanism fails and sweating stops. The core body temperature rises dramatically and the victim's condition becomes a serious medical emergency. It must be noted that heat stroke can result in death if medical attention is not accessed early. However, apart from these dangers, heat stress can pose indirect heat related problems such as reduced worker performance as tired and fatigued employees tend to perform with reduced accuracy and efficiency. According to Judge (2003), apart from reduced work output, tired and fatigued employees are more susceptible to work related accidents and injuries. Heat stress has also been shown to reduce both male and female fertility. It must be noted that the study revealed that all the metal fabricating SMEs were not conducting pre-placement and periodical medical examinations. This situation entails that employees with medical conditions such as lung, heart or kidney diseases can be blindly assigned to work stations where they are prone to heat stress. This is a major heat hazard since if an employee already has a heart, lung, kidney or circulatory problems, heat stress may precipitate episodes of acute health problems on the affected employee.

4.5 Poor Electrical Installation and Usage

Despite being noted by only 10 (6%) of the management/owner respondents and 12 (8.1%) of the employees respondents, field observations by the researcher revealed that unsafe electrical installation and usage were quite rampant. These ranged from direct insertion of electrical wires into sockets without plug tops, having cable joints uncovered/uninsulated with approved tape, tying or holding switches that kept tripping, to maintain them in the on position, overloading circuits, relying on cheaper uncertified “bush” electricians for repairs among other hazards.

4.6 Poor Housekeeping

All visited SMEs had challenges with housekeeping despite only 2.4 % of the employers and none of the employees appreciated it as an OSH hazard. According to the Canadian Centre of Occupational Health and Safety, poor housekeeping can contribute to workplace accidents by hiding hazards that causes injuries. The Centre noted that good housekeeping was not just about maintaining cleanliness, it included keeping work areas neat and orderly, maintaining floors free from slip and trip hazards etc.

4.7 Ergonomic Hazards

Lifting of heavy objects was noted by 8 (4.8%) whilst use of improvised tools was noted by only 1 (0.6%) of the sampled enterprise owners/managers. All sampled enterprises had some employees working in awkward postures especially during welding. Heavy lifting of objects mainly in structural and industrial fabrication metal fabrication processes. People sitting on makeshift chairs like drums and crates were quite prevalent.

4.8 Chemical Hazards

5.4% of the employees and 6% of the owners/managers expressed concern on exposure to chemicals in form of degreasers, paints, solvents among other metal working fluids. Despite the problem being quite wide spread contrary to the picture portrayed by the questionnaire response, field observations indicated that the problem of exposure to various harmful chemicals inform of solvents and fumes and vapours of paints etc were quite pronounced in commercial metal fabricating SMEs where panel beating and spray painting activities were quite pronounced.

4.9 Poor lighting

Illumination issues appeared not to be a major OSH problem across most small and medium scale metal fabricating enterprises under study. The study revealed that most enterprises (82.1%) had light intensity levels above the acceptable national standard of not less than 300 lux. The industrial metal fabrication enterprises had in some instances poorly light areas as demonstrated by 11 out of 33 sampled points with less than 300 lux, followed by the structural metal fabricating enterprises with 18 out of 70 sampled points with less than 300 lux as shown in Table 6.

Table 6: Cross tabulation table of light measurements

		Light intensity		
		< 300 Lux	> 300 Lux	Total Points
Sector of operation	COMMERCIAL FABRICATION	3	73	76
	INDUSTRIAL FABRICATION	11	22	33
	STRUCTURAL FABRICATION	18	52	70
	Total	32	147	179

Of the 179 areas assess, only 17% of the areas had light levels below the required 300 lux as per the Factories and Works Act. The reason could be because some of the operations are done in areas that are fairly open with parts being covered by a short wall and a shade on top. Further to that all measurements were carried out during normal day working hours, such that if there are operations conducted during the night, the results could be different. However, worrisome to note that with the above situation, when asked about what else could be done to contain the existing hazards, 13.3 and 20 percent of the respondents requested for danger allowance and being given milk to wash away the inhaled dust. This was a clear testimony for the need of some significant OSH awareness and training programs to the employees. The above responses are show in Figure 7.

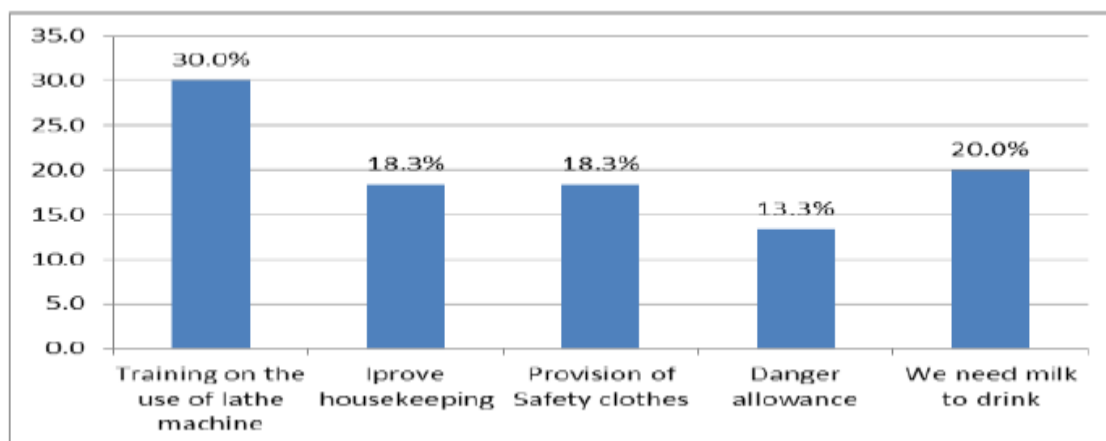


Figure 7: Percent distribution of Employees by their recommendations on how to manage the existing OSH problems

Enterprise operators indicated that all the 56 small and medium scale metal fabricating enterprises studied in Willowvale had no functional OSH policy, were not implementing any OSH management system, were not conducting any pre-placement and periodical medical examinations and had no procedure for OSH training needs identification, that has resulted in 76.8% having never conducted any accident prevention training since they started operating. Only 8 (14.3%) had a hazard register though however there were no formal workplace hazard identification procedure as indicated by the findings in Table 7.

Table 7: Hazards identification methodologies used in Metal Fabricating SMEs

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid General Observation	41	64.1	64.1	100.0
Told by city council	2	3.1	3.1	100.0
NSSA Inspection	14	21.9	21.9	100.0
Reports from employees	7	10.9	10.9	100.0
Total	64	100.0	100.0	

Only 5 out of 56 enterprises had an OSH legal register, with only 32.1% indicating that they were reporting any OSH accidents to the regulatory authorities. However this seem to be misleading since most of these accidents were reported to the Zimbabwe Republic Police and not NSSA as revealed by the follow up question on which regulatory authority and interviews from NSSA Inspectorate section that receives and investigates all occupational accidents in industries in line with the provisions of the Factories and Works Act. This poor OSH trend was also indicated in terms of emergency preparedness and response planning. Only 3.6% of the studied enterprises and emergency preparedness and response plans, though however the trend was rather better in the case of first aid services were 26.8% had trained first aiders with valid first aid certificates from reputable training bodies such as Red Cross and St Jones Ambulance Services. Small scale metal fabricating industries in Willowvale appeared to be doing quite well in terms of their provision of toilet and sanitary facilities. 91.1% of the sampled enterprises had adequate sanitary facilities; however they were poor in terms of supplying these facilities with toilet paper as demonstrated by 44.6% of the enterprises coming short on that requirement.

4.10 Current Occupational Safety and Health Management Practices in Metal Fabrication SMEs

4.10.1 Safety Inductions

The study revealed that there the majority (55.6%) of small and medium scale metal fabricating employees in Willowvale were never exposed to workplace safety induction training. The 44.4 percent of employees claiming to have received some form of workplace induction could be slightly misleading since some employees might have completed the question with the thought of a general machinery induction on how to operate it for production than on how to safely use it. This assertion can be cemented by the fact that 50 (89.3%) of the sampled enterprises indicated that they did not have written down safety induction programs for their new employees which is contrary to the statistics indicated from the employees in their response to the same subject matter. Safety induction is of critical importance in ensuring that employees are proactively informed about the occupational safety and health hazards at the workplace and how to deal with them in terms of appropriate control measures.

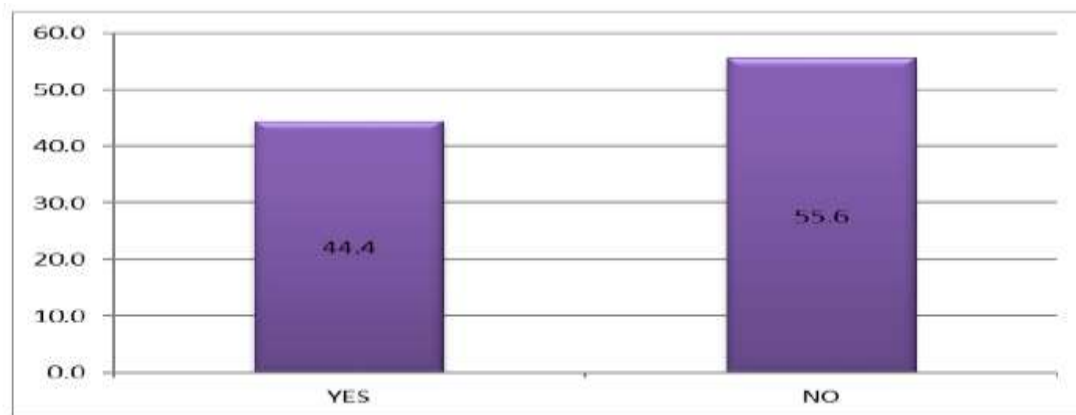


Figure 8: Percentage Employee Exposure to Safety Induction Prior to Commencement of Duties

4.10.2 Pre-placement and Periodical Medical Examinations

The research revealed that of the 81 respondents, only 6 (7.4%) acknowledged that they went for pre-employment medical examinations when they got employed. According to various OSH legal provisions such as the Factories and Works Act, Pneumoconiosis Act, SI 68 of 1990, to just mention just but a few, pre-employment medical examinations must be done on all workplaces prior to employment or placement of an employee in a workplace with known or unknown potential hazards. However failure to conduct pre-employment health examinations deprives the employer of an opportunity to determine if the potential employee is able with or without any adjustment to perform the inherent requirements of the job without putting himself or others to risk due to an existing condition or predisposing factor(s). The above situation has resulted in 92.6 percent of the respondents working without knowing their health status prior to starting work. This has resulted in these SMEs failing to develop employee medical and occupational history, hence increasing the probability of incorrectly placing an employee into an unsuitable job or work environment. The situation further deteriorated when the employees were asked if they were currently receiving any periodical medical examinations. The responses highlighted that only 2 employees who amounted to 2.5 percent have been receiving periodical medical examinations with the rest (97.5%) being left to fate. This entails that early detection and treatment of an occupational disease is almost impossible hence threatening the health status of any exposed employee to workplace hazards.

4.10.3 Absence of OSH Policies at Metal Fabricating SMEs in Willowvale

It was noted that of the sampled metal fabricating SMEs in Willowvale industrial area, all of them had no occupational safety and health policy. It should therefore be realized that an occupational safety and health policy is of paramount importance in trying to show management commitment in occupational safety and health issues. However, this is not the existing scenario currently in metal fabricating SMEs as shown by the statistics above. One can easily deduce that absence of comprehensive occupational safety and health policies is one of the root causes of a poor OSH culture in metal fabricating SMEs. Organizations cannot create an effective preventive occupational safety and health culture without expressed occupational safety and health policies. OSH performance improvement cannot be guaranteed in metal fabricating SMEs without an expressed OSH policy since it is a core element of safety improvement at enterprise and even national level. According to Mudavanhu et al (2013) it is difficult to apply any systematic approach to OSH management without a policy, hence since all SMEs had no policy, it can be viewed that OSH management in this important economic sector is non-existent.

4.10.4 Lack of OSH Training Programs and OSHMS

The results obtained indicated that most metal fabricating SMEs were not forthcoming to invest in occupational safety and health training programmes. Training programmes should cover both new and experienced personnel. Occupational safety and health knowledge gaps must be identified first and covered by appropriate training initiatives. In accordance to the 3rd schedule of the statutory instrument 68 of 1990 NSSA Act, this is one of the duties an employer is expected to perform in a bid to reduce occupational accidents and their recurrence at the work place. However, most enterprises felt that this was expensive for them in terms of time and monetary resources required. This confirmed what other stakeholders such as NSSA, Harare City Health Department and ZCTU, felt that most metal fabricating SMEs were operating on a quick fix approach to business since some of them were still characterised by a high degree of the informal sector operating approach where they viewed OSH issues as a luxury that can only be achieved by well established companies.

The same was noted on occupational safety and health management systems, where 100% of the sampled metal fabricating SMEs were not concerned about adopting let alone implement such systems. Occupational safety and health management systems are a key international best practice for OSH performance within all enterprises. These management systems encourage continual improvement on occupational safety and health standards at enterprise level. However, the failure by all metal fabricating SMEs to adopt and implement sound management systems has also been another key driver of the perceived high rates of occupational accidents in this sector which have proven difficult to quantify due to rampant none reporting and recording of such accidents.

4.10.5 Inadequate and Inappropriate Personal Protective Clothing and Equipment

From the statistics obtained in this study, it has indicated that there is a fairly high investment being done in towards personal protective clothing provision i.e 85.2% of the employees indicated to have received some form of ppc/e. However, it should be noted that in terms of occupational safety and health hierarchy of controls, provision of personal protective clothing is the last line of defence after all other controls have failed which include among others engineering, administrative, substitution and elimination have failed. This is due to the fact that personal protective clothing does not remove the hazard but just provide the barrier between the user and the hazard and its effectiveness is based on its maintenance and proper use. It can be generalized that personal protective clothing is as good as its user. However, basing on the results under training, the proper use of the provided personal protective clothing can be questioned as it is mainly issued to employees who are not being equipped with the prerequisite training in on their effective use and maintenance. This therefore is tantamount to false protection as some of the personal protective clothing which were being provided were observed to be inappropriate to the kind of hazards employees were exposed to e.g. use of dark sunglasses during welding and even mutton cloth as some form of respiratory protection against dust, fumes and vapours during panel beating and spray painting operations.

4.10.6 Absence of Accident Recording and Reporting Procedures and Mechanisms

It has been revealed from the study results that issues of accident reporting and investigation remains a challenge in metal fabricating SMEs. 32.1% of the sampled SMEs indicated that they were reporting their accidents to regulatory authorities that included Zimbabwe Republic Police and NSSA though however 87.5% of these enterprises did not have a written down accident investigation procedure which has resulted in a number of work place accidents going unreported. This has greatly undermined NSSA's vital role of assisting these enterprises with external accident investigation services since they can only be done when accidents have been timeously reported before disturbances to the accident scene. Absence of adequate accident investigation has resulted in recurrent accidents being experienced in most enterprises, a scenario which could have been prevented through appropriate accident reporting and investigation by competent authorities like NSSA.

4.10.7 Absence of Emergency Preparedness and Response Plans

It has been widely agreed according to the International Labour Organisation (ILO) that the number of casualties and costs related to an emergency or a disaster is mainly magnified due to panic, fear, confusion and late response as a result of absence of proactive preparatory measures in form of emergency preparedness plans. The fact that only 3.6% of the studied small and medium scale metal fabricating industries had emergency preparedness and response plans means that 96.4% of the SMEs were failing to discover and eliminate unrecognized hazardous conditions that may aggravate an emergency situation. The planning process may bring to the fore existing workplace deficiencies such as lack of equipment, trained personnel and other supplies that can be rectified before an emergency occurs. In addition the Canadian Centre for Occupational Health and Safety noted that emergency planning comes along with other benefits such as promoting safety awareness and demonstration of the organisation's commitment towards the safety of its workers and surrounding areas.

4.10.8 Poor Registration of Metal Fabricating SMEs as Factories

Of the 56 metal fabricating SMEs covered, only 6 amounting to 10.7% were registered as a factory and had a valid registration certificate. The remaining 89.3% though falling under the definition of a factory (See section 1.7), were not registered, thus in terms of the Factories and Works Act were operating illegally. This also meant that these SMEs were missing out on independent inspections of Factories conducted by Factories Inspectors who in turn gives free advice or corrective measures and adoption of measures to improve the safety and health of employees proactively.

4.10.9 Absence of Safety and Health Structures

None of the respondents had established a functional safety committee, appointed a safety officer or a safety representative in accordance to the requirements of the Third Schedule of SI 68 of 1990. Furthermore no specific budgetary support was set aside for OSH issues and none considered integrating OSH issues in business planning. The interview with the SMEAZ chairperson indicated that although they did not have registered members from Willowvale industrial area, their topmost concern as SMEs across the various economic sectors was that of funding, production and both local and regional market penetration. The association pointed out that although legally and morally OSH issues were of significant value, it was of no value to them to setting up various OSH structures and seek to adhere to the stringent OSH laws when they were facing serious financial constraints due to economic hardships.

V. CONCLUSION

Metal fabricating employees in the Willowvale Industrial area are exposed to a number of safety and health hazards that include excessive noise, excessive heat as confirmed by the occupational hygiene measurement conducted, poor housekeeping, hazardous chemicals, ergonomic hazards, inadequate and inappropriate personal protective clothing and equipment to name just but a few. Most of metal fabricating SMEs were operating outside the provisions of the existing OSH legislation as evidenced by absence of OSH structures. None of the sampled enterprises had written down OSH policies and work procedures, establish functional safety committees or appointed safety officers or representatives to coordinate and spearhead safety programs at these enterprises. 50 (89.3%) of the 56 sampled enterprises were not registered as per the requirements of the Factories and Works Act, and 87.5% of the organisations had no accident recording and investigation procedure. There is need to formulate national policies targeted at improving occupational safety and health in small and medium scale enterprises with greater emphasis on training of owners, managers and general employees on sustainable mechanisms of occupational safety and health at enterprise level. This could be in form of tailor made training programmes that are developed in line with the nature of hazards existing at particular enterprises since these hazards tend to vary from one organisation to the other depending on the nature of operations being undertaken. This should be supported by an effective communication system that will ensure a smooth free flow of occupational safety and health information among the SME owners, managers, employees and officials from the regulatory authorities such as NSSA.

It is necessary to urgently take appropriate measures to prevent noise induced hearing loss (NIHL) amongst the exposed workers. These measures could include provision of appropriate ear protectors to each of the affected workers in all areas with noise levels above 85dB (A). An initial audit should be conducted before the noise induced hearing loss programme (NIHLP) is implemented or if changes are made to an existing programme. Accurate characterization of the noise hazard present in the workplace and the subsequent identification of affected workers are both an important part of the NIHLP. Periodic noise monitoring to identify situations where the noise levels have changed because of, aging equipment, equipment with maintenance problems and undocumented process changes should be upheld. Monitoring should be repeated as soon as possible if changes in fabricating processes or equipment are done. In the case of heat stress, it is recommended that industrial metal fabricating SMEs must consider introducing a heat acclimatization programme to all new employees who might be a risk from heat stress.

Interaction between OSH personnel (Occupational Hygienists, Ergonomists, Factories and Works Inspectors, OSH Promotions Officers and Medical Services personnel) and the small and medium scale enterprises should be increased and sustained. There is need to inculcate a sense of social and moral responsibility on the part of small and medium scale metal fabricating enterprises in Willowvale on issues relating to safety, health and general welfare of their employees so as to develop a positive organisational occupational safety and health culture. There is need, for OSH authorities like National Social Security Authority in collaboration with tertiary institutions to invest in further research focusing on various SMEs in other economic sectors and cities and provinces, since the current study could just be a tip of an iceberg.

REFERENCES

- [1]. Alli, B.O. (2008). Fundamental Principles of Occupational Health and Safety. Geneva: International Labour Organization.
- [2]. Bryman, A. (1988). Quantity and Quality in Social Research. Routledge, London.
- [3]. Chikova, H.N. (2011). Perceptions of Enterprise Risks and their Impact on Social Security Administration: The Case of the National Social Security Authority. Dissertation Submitted to The Graduate School of Management, University of Zimbabwe.
- [4]. European Agency for Safety and Health at Work (EU-OSHA) (2010). Annual Management Plan and Work Programme Final Version. Bilbao, Spain.

- [5]. Hızıroğlu, A. (2012). Analysis of Current Occupational Health and Safety Situation and Needs of SMEs in Turkey. *Journal of Labour Relations*, July 2012, Volume 3, Number 2, Page: 66-89. Accessed on www.calismailiskileridergisi.org (19/03/2014).
- [6]. International Labour Organisation (ILO), International Social Security Authority (ISSA) and Korea Occupational Safety and Health Agency (KOSHA) (2008). *Seoul Declaration on Safety and Health at Work*. Accessed on www.seouldeclaration.org (27/07/2013).
- [7]. Mmasi, S.M. and Mwenisongole, C. (2012). Compliance of Small and Medium Enterprises with Government Regulations: A Case Study of Metal Works SMEs in Arusha Tanzania. *International Journal of Scientific & Engineering Research*, Volume 3, Issue 10, October-2012. Accessed on <http://www.ijser.org> (19/03/14).
- [8]. Moyo, D. (2015). Review of Occupational Health and Safety Organisation in Expanding Economies: *The Case of Southern Africa: Annals of Global Health* Vol 81(4), Pages 495–502
- [9]. Moyo, D. (2017). Review of occupational Health and Safety organisation in expanding economies: The case of Southern Africa. *Elevier BV: Relx Group- Science Direct*.
- [10]. Nunes L. I. (2016). Occupational Safety and Health risk assessment methodologies. Portugal : Faculdade de Ciencias e Tecnologia, Universidade Nova de Lisboa.
- [11]. Puplampu, B.B. and Quartey, S.H. (2012). Key Issues on Occupational Health and Safety Practices in Ghana: A Review. *International Journal of Business and Social Science*, Vol.3 No.19: October 2012. Accessed on (18/03/2014).
- [12]. Regional Committee for Africa Report (2004). Occupational Health and Safety in the African Region; Situational Analysis and Perspectives. Fifty-fourth Session (WHO) Brazzaville, Republic of Congo, Africa, 1-25.
- [13]. SafetyLine Institute (2009). Occupational Health and Safety Practitioner: Reading Introduction to Machine Hazards.
- [14]. Saunders, M., Lewis P., and Thornhill A. (2009). *Research Methods For Business Students*, 5th Edition. Prentice Hall.
- [15]. Seneviratne, M. and Phoon, W.O. (2005). Exposure Assessment in SMEs: A Low-Cost Approach to Bring OHS Service to Small-Scale Enterprises. *Journal of Industrial Health* 2006, 44, 27-30. Accessed on (27/07/2013).
- [16]. Solaja ,M and Oludele, T. (2014). The effect of work systems and workplace hazards on employees behaviour ,*Global journal of ,management and business research :A administration and management*,14(3).Accessed at <https://journalofbusiness.org> on September 21 ,2017.
- [17]. Stelea, M.P., Balan, G. G. and Afrim, N.B. (2016) The place and role of proactive safety behaviour in occupational risk management ,7th International multidisciplinary symposium.
- [18]. Zimbabwe Independent – June 28 to July 4, 2013: Eric Bloch Column.
- [19]. Workplace Safety Health (2016). *A guide to near miss reporting*. Workplace Safety Health Council. Available from <http://www.wshc.sg> [Accessed 10 February 2017]