An Initial Study on Accident Rate in the Workplace through Occupational Safety and Health Management in Sewerage Services

Amirrudin Abdul Aziz
Mohd Esa Baruji
Muhammad Syaidan Abdullah
Nik Fadhilah Nik Him
Norsyahidah Mohammad Yusof
National Institute of Occupational Safety and Health (NIOSH)
Malaysia

Abstract

The issue on the importance of Occupational Safety and Health (OSH) is gaining more attention in the industries. The objective of this paper is to emphasize on the OSH legal compliance among Small and Medium Enterprises (SMEs) involved in the sewerage services. The methodology of this paper is through quantitative research on 69 respondents of contractors in the sewerage services. The general findings of this paper show that there are significant relationships between OSH risk management factor and communication and safety report.Moreover, managerial commitment is the main factors that restrict workers' compliance with OSH in the workplace. Overall, the analysis indicates that the main issues that affect contractors compliance with OSH legal complianceis the lack of financial resource for the implementation of OSH programs. This paper suggests the necessary steps to be taken in improving the level of OSH through the implementation of OSH management method that able to reduce the rate of accidents in the workplace.

Keywords: Small and Medium Enterprises, Occupational Safety and Health management, Sewerage services, Legal Compliance

1. Introduction

SMEs and large multinational companies are very different in many aspects. These differences have huge impact when it comes to the implementation of OSH and this raisesseveral issues. Most of SMEs are lacking in term of financial capability to provide and develop safety program internally in order to comply with OSH compliance compare to the large company. The success of an organization is not just determined in term of financial aspect, but it also takes into consideration the factor of accidents which involves property, disrupts productivity, and causes injury or loss of life as well as the reputation of a company.The size of the company plays a big part in the effectiveness of OSH implementation (Cook, 2007). In Japan, half of the cost to implement OSH is subsidized if a group of SMEs is organized to fulfill certain condition such as holding joint occupational health and safety meeting regularly (Mizoue et. al., 1999).

Modernized sewerage propagated throughout Europe after mid-19th century, as the dumping of human waste into streams along with other causes led to urban problems such as a raging cholera epidemic; while Seoul did not experience the same problems, concerns nevertheless arose regarding similar risks. Continuous investment of additional financial resources is needed in order to meet these requirements. Since the current sewerage user fee is extremely low, insufficient financial on funding for sewerage facilities support for the sewerage system, making even the adequate maintenance of existing sewerage a difficult task (Kim, Young-Ran, 2014).

There was an increase in severity and incidents rates in 2012 compared with previous years. The highest two work-days lost accidents in 2012 resulted from lifting and traffic accidents with 134 and 86 work-days lost respectively. However, the work-days lost due to these two accidents reduced to 33 days and 51days respectively in 2013. Several awareness programs were introduced such as an H&S quiz and H&S campaign in 2012 and a defensive driving training for vehicle drivers.

The highest occurrence of work-days lost accidents were slip sand falls in 2013. The total work-days lost as a result of these accidents increased from 43 days in 2012 to 194 days in 2013 *(IWK Sustainability Report 2012-2013).*

Sewerage work involves highly risky operations and safety measures have to be given paramount consideration. All activities are conducted with full regard for safety at our facilities, sites, vehicles and equipment. This practice protects the safety and health of our employees, communities adjacent to our operations and the public in order to achieved OHSAS 18001:2007 and MS 1722:2011 in May 2013*(IWK Sustainability Report 2012-2013).*

Therefore, studies targeting the SME contractors are required in identifying the level of compliance to OSH at the workplace among the contractors, and to propose for actions to improve the level of compliance with OSH, which could indirectly reduce the rate of injuries and deaths that create losses to the country in general.

2. Literature Review

As a developing country, the improvement of occupational safety and health issues at the workplace should be made on an ongoing basis in line with the fast-growing Malaysian economy. With the increasing number of SMEs, Malaysia is facing greater challenges in monitoring the requirements of OSH, although at the same time the SMEs need to remain competitive and to survive with limited capital or financial resources (Lilis, Khoo, & Daisy, 2011).At present, the Occupational Safety and Health Management System (OSHMS) has gained the attention of the world. This system has been accepted as a way of a continuous approach in preventing or reducing accidents and injuries. Apart from that, it can also increase the awareness about health and safety in an organization. With regard to this, Malaysia has also published a standard on occupational safety and health management system, known as the Malaysian Standard, MS 1722: 2011. This standard provides the requirements for OSHMS and forms the basis in maintaining OSH culture in an organization. The OSH management requires for a more systematic approach compared to OHSAS 18001, where on the one hand, it appears only as a management tool in achieving effective and efficient risk management of the OSH (NIOSH, 2013).

The provision of training programs in OSH is important because they can help to build and increase the capacity of the SME industry in implementing OSH in the workplace. Previous studies have found that any support or assistance received by the SME industry in implementing OSH programs could promote proper implementation regarding the application of OSH in the workplace (Lingard & Rowlinson, 2005). Thus, SMEs need to provide training and supervision for the workers about OSH so that the level of awareness about OSH among employees can be increased.

Effective implementation of OSH also can reduce accident rates, and thus reduce the compensation paid. A study found that the safety measures taken at the workplace can lead to better safety performance (Jaselskis & Suazo, 1993; Teo & Phang, 2005).Based on the findings obtained, it is found that the SMEs need to perform monitoring as frequent as possible to ensure proper monitoring and effective OSH compliance.

Managerial commitment is defined as the involvement of the management in any actions towards achieving the goals of the company (Cooper, 2006). Gilkey, Keefe, Hautaluoma, Bigelow, Herron, and Stanley (2003) found that support from the management is crucial in the implementation of OSH.The management must be committed in allocating the budget for OSH activities in order to produce effective implementation of OSH. Apart from that, managerial commitment can also be seen from the management's commitment in penalizing employees who do not follow safety precautions, such as not using protective equipment while working (Holmes, 1999).

This view is supported by Dejoy (1985), and also by Lin and Mills (2001), by emphasizing on a two-way communication between the employees and the management to facilitate effective implementation of OSH. Therefore, the organizational structure of SMEs usually conforms to the small structure with a director who usually acts as a financial manager, and also as a human resources manager. Due to the small size of the company, each additional worker adds costs to the organization, and the employees are usually given more than one job responsibilities. The management of SMEs take up just a small amount of time in solving safety issues, which is a widespread phenomenon in the United Kingdom and Spain (Vassie, Thomas, & Oliver, 2000). Therefore, the management of the SMEs must demonstrate a strong commitment towards the implementation of OSH.

Even if the workplace is safe, all OSH measures might fail if the employees do not possess the right knowledge, attitude and behavior towards the practice of OSH in the workplace (Raouf & Dhillon, 1995; Cooper & Philips, 1994).Employee attitude towards OSH is important in reducing workplace accidents in the SME industry.

In addition, external support is also needed for the successful implementation of OSH, such as the provision of information and the exchange of experience, also it is always being in the same group that would share knowledge and information about the implementation of OSH in the SME industry (Saksvik, Torvatn & Nytro, 2003).

3. Research Methodology

This study covers the SMEs contractors in the sewerage services. This study focus on registered contractors and for those who belong in the SME category in Selangor and Kuala Lumpur, Malaysia. These areas have been selected due to the most registered and active contractors in sewerage services are located in these two states. Therefore, the findings of the study will be representing the whole sewerage services in the country.

Workers aged 18 years and above, and representing the SME contractor are the respondents of this study. A total of 69 respondents were involved in this study.Questionnaires were used to determine the respondents' background information and company information. The questionnaire was developed also consists of six elements, namely training and supervision, safe operating procedures (SOP), OSH management system, communications and safety report on OSH, managerial commitment, employee attitude towards OSH. The purpose of this questionnaire is to obtain a basic assessment of the level of compliance and OSH management system in the sewerage services from the perspective of the contractors. Convenience sampling was used in which the questionnaire was directly handed out to the representatives of the contractor.

All the data obtained were analysed using the latest version of the Statistical Package for Social Sciences (SPSS). The exploration of the data analysis was made using Q-Q Plots. Descriptive analysis is used in obtaining the frequency table or the percentage, and the two-way tables. Descriptive analysis is used to obtain a frequency table or a percentage, two-way tables, mean, and standard deviation. The development of action plan for improvements was made based on the information obtained from the respondents.

4. Result

A pilot study was conducted on the questionnaire before they are distributed to the actual respondents in the main fieldwork. A pilot study of the questionnaire is a method for ensuring the reliability and validity index of the questions is between the range of 0.7 and 0.9(Hair et. al., 1998).

Table 1: Analysis of Respondents' Overall Reliability and Validity

Cronbach's Alpha	No. of Part
0.926	6

Table 1above clearly shows that the reliability value for the response on the overall statement from Part C to Part H is high, which is 0.926. This shows that the overall understanding of the respondents is consistent and that the level of response error rate is at the lowest level.

Table 2: Reliability and Validity Analysis of Each Statement

Manipulated Variables	Cronbach's Alpha	No. of Statement
Training and Supervision	0.923	10
Safe Operation Procedure	0.940	11
Management of OSH Risks	0.946	16
Communication and Safety Report	0.921	9
Managerial Commitment	0.903	6
Employee Attitude Towards OSH	0.842	4

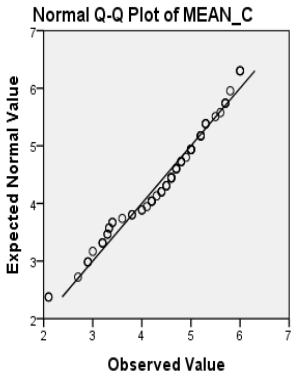
Based on the table 2, the reliability value of each manipulated variable is high, where all are above 0.8 and approaching 1.0. In conclusion, all of the statements provided are easily understood by the respondents.

Table 3: Descriptive Analysis for Each Statement

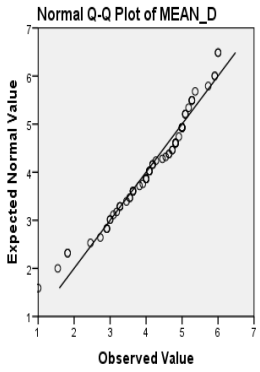
Manipulated Variables	*Mean Score*	*Standard Deviation*
Training and Supervision	4.41	0.95
Safe Operation Procedure	4.16	1.09
OSH Risk Management	4.10	1.07
Communication and Safety Report	4.46	1.01
Managerial Commitment	4.08	1.19
Employee Attitude Towards OSH	4.39	1.10

Based on the Table 3, the communication and safety report aspects scored the highest mean value of 4.46 in terms of the level of compliance and the issue on the legal compliance of OSH. Similarly, the value of standard deviation recorded the lowest value (0.95), which means that the standard deviation for each of the Likert Scale value answered by all respondents is 0.95. Thus, the deviation rate is less, and this leads to a more accurate set of data distribution. In conclusion, communication and safety report is an important variable for SME contractors in the sewerage services.

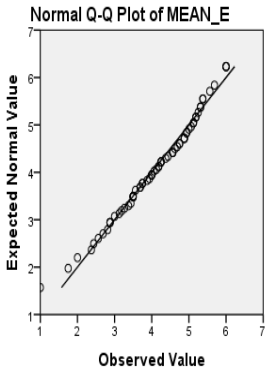
Table 4: Q-Q Plot for Each Section



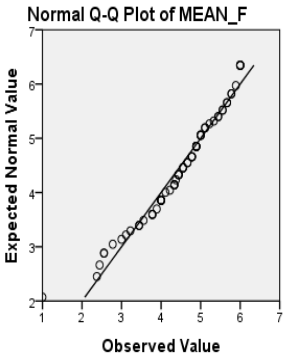
Training Q-Q Plot



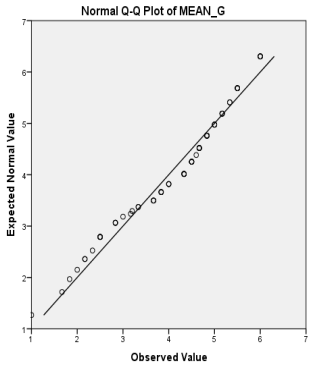
ProcedureQ-Q Plot



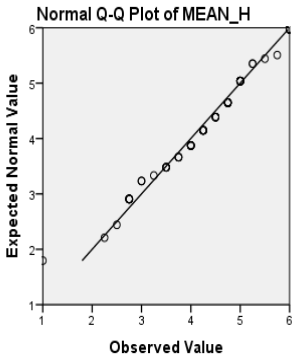
OSH Q-Q Plot



CommunicationQ-Q Plot



ManagementQ-Q Plot



AttitudeQ-Q Plot

Based on Table 4, it is found that the three parts of all the points are approaching to and are located on a straight line. This shows that all parts are approaching the normal distribution.

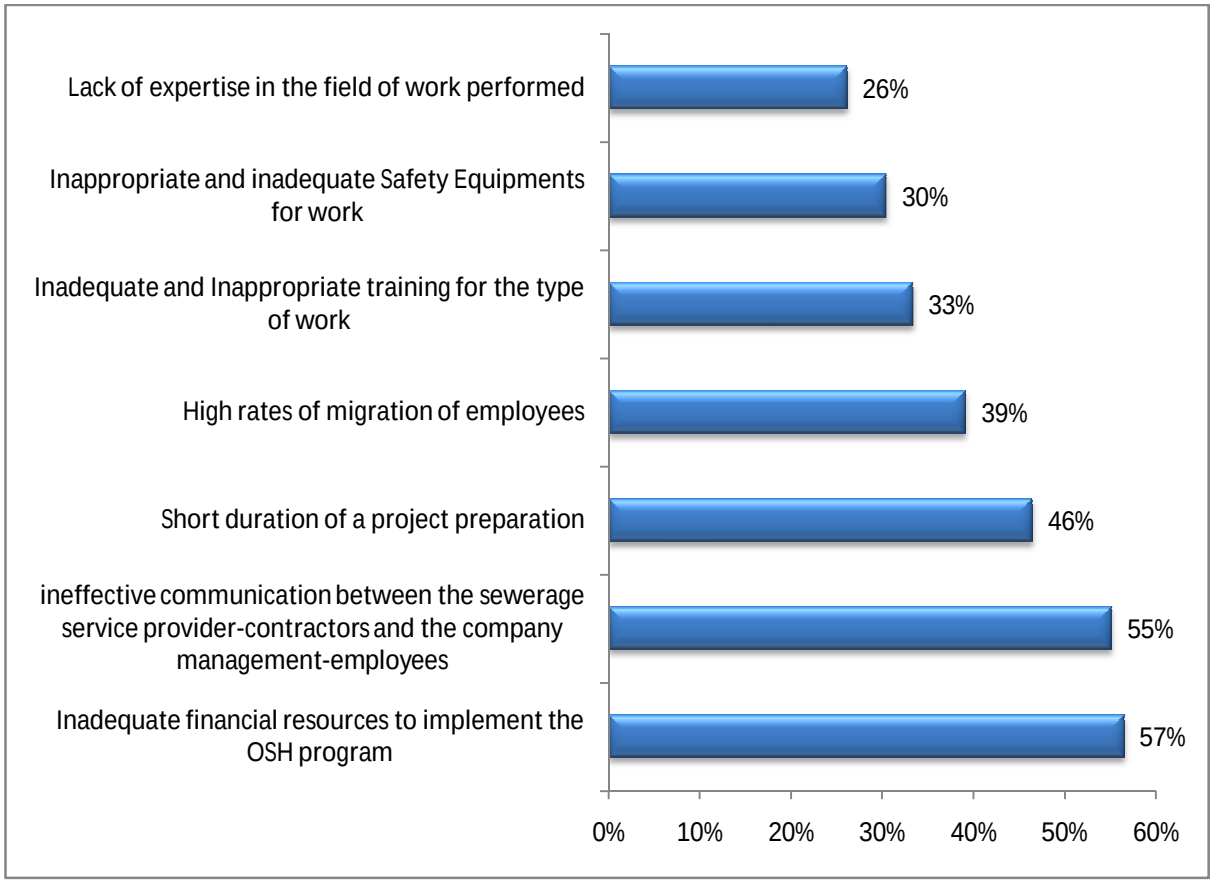
Table 5: The Correlation for Each Statement

		MEAN_C	MEAN_D	MEAN_E	MEAN_F	MEAN_G	MEAN_H
MEAN_C	Pearson Correlation	1	.713**	.697**	.604**	.607**	.626**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	69	69	69	69	69	69
MEAN_D	Pearson Correlation	.713**	1	.763**	.665**	.606**	.555**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	69	69	69	69	69	69
MEAN_E	Pearson Correlation	.697**	.763**	1	.839**	.756**	.780**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	69	69	69	69	69	69
MEAN_F	Pearson Correlation	.604**	.665**	.839**	1	.655**	.728**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	69	69	69	69	69	69
MEAN_G	Pearson Correlation	.607**	.606**	.756**	.655**	1	.620**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	69	69	69	69	69	69
MEAN_H	Pearson Correlation	.626**	.555**	.780**	.728**	.620**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	69	69	69	69	69	69

**. Correlation is significant at the 0.01 level (2-tailed).

Based on Table 5, the correlation of each variable is significant and strong between one another when the p-value is less than 0.05. In addition, OSH risk managementvariables are closely related to the variable of communication and safety report, where the correlation value between them is 0.713 compared to the other variables.

Graph 1: The Issues Faced by the Contractors



Based on the results in Graph 1, majority of the sewerage service provider contractor representatives agree that the 7 main problems faced by them. This is due to managerial commitment to provide proper OSH programs

which required more investment in term of financial resources. This is proved by the findings shown in Table 3 where the mean value for managerial commitment (4.08) is the lowest.

5. Suggestions for Improvement

A total of 16 improvement activities have been proposed to overcome by the researchers to overcome those problems which are as follows:

i. To implement the granting of incentive for OSHMS certification for sewerage contractor companies
ii. To increase financial assistance related to OSH training based on the priorities identified by the sewerage service providers
iii. To grant/give vouchers for the purchase of Personal Protective Equipment (PPE) to the companies for the employees
iv. To provide incentives/rebates for contractors who achieve excellent records in OSH (for example: zero accidents/occupational disease)
v. To reduce the payment of insurance premiums/protection for achieving outstanding records in OSH
vi. To provide incentives OSH courses incentive scheme, which is sponsored for first timers (for example: OSH induction)
vii. To specify the allocation of OSH requirements (PPE, training, induction, safety equipment) in all employment contracts between the sewerage service provider& the contractors
viii. To establish OSH legislation regarding the need to provide the finances in the employment contract
ix. To develop OSH documentation for the dealings of communication on contract management – the use of simple and easy format/language (OSH guides/ & project management)
x. To use information and communications technology (ICT) for the dissemination of information on OSH
xi. To establish training programs that involve both the sewerage service provider and the contractors
xii. To establish strategic and integrated collaborations among interested parties in the sewerage services in overcoming the overlapping scope of authority and duties
xiii. To implement a system of penalties and incentives on the employees with regard to OSH compliance issues
xiv. To implement an incentive program for contractors with the lowest records in a specified timeframe
xv. To implement a review, amendment and/or enhancement program to the existing SOP, done periodically with the Sewerage service provider
xvi. To increase the campaigns on awareness about OSH to the employees of the sewerage services.

6. Conclusion

This study is undertaken to identify the issues encountered by contractor in order to comply with OSH regulations in this sewerage services. This study also will be able to give benefit for more than 98.5% of SMEs in term of OSH management system, reduce the accidents and improve productivity to the country in the future.This study has proved that the factors of communication, attitude and cost are the main issues in order to have an effective and better implementation of OSH management system in the sewerage services. This study also will help to restructure the country's sewerage industry and will be strengthen the OSH compliance and enforcement in this sewerage services through the proposed improvements plan.The impact of this study will change certain parts in employment contracts between the main contractor and the contractors in the future. All employment contracts will be specified the allocation of OSH requirements. The changes also apply to the legislation. OSH legislation will be established with regard to the need to provide the OSH finances in the employment contract.

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