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Exposure Assessment in SMEs: A Low-Cost Approach to Bring OHS Services to Small-Scale Enterprises

Mahinda SENEVIRATNE[1] and Wai On PHOON[2]*

[1] (formerly) Workers Health Centre, Parranmatta Road, Granville, Australia
[2] Faculty of Medicine, University of Sidney, Australia

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Abstract: There is increased attention to improving occupational health and safety in small to medium-sized Enterprises (SMEs). The Workers Health Centre, a not-for-profit OHS service in western Sydney, assessed workplace exposures in two SMEs following intervention by regulatory agencies. A low-cost monitoring program for noise, airbone dust, fibers and chemicals was conducted at these two metal working industry workplaces. Results showed that exposure to the hazards were above the statutory limits and there was generally an unhealthy access to OHS information by the predominantly immigrant or low literate worker population, were identified. The potential for using a program of low-cost exposure assessments, accompanied by a strategy to provide OHSs information for workers in small-scale enterprises, is discussed.

Key words: Small to medium-sized enterprises, OHS service, Exposure assessments, Information

Introduction

Small to medium-sized enterprises (SMEs) are a key sector in a country's economy and are vital to achieving national economic goals. The Australian Bureau of Statistics (ABS, 1996) estimated that there ware about 850,000 small businesses* in Australia, accounting for approx. 97% of all private sector businesses in the country.

This proportion has substantially increased in the past two decades with the structural changes in the Australian economy. In 2000, SMEs employed a total of nearly 3 million people which was over half of all private sector employment in Australia.

However, occupational health and safety problems in SMEs have not been adequately addressed over the years. In Australia, the National OSH Commission undertook a number of activities in its national OSH strategy since 1997 to address the problem.

(* a small buisiness was defined as 'non-manufacturing industries employing less than 20 employees and manufacturing industries with less than 100 employees'. SMEs were also characterized by being independently owned and operated; closely controlled by owner/managers who predominantly contributed the operating capital and were the principal decision-makers in the business.)

OHS problem in SMEs

In 1997, a Small Business Deregulation Task Force in Australia identified OHS as one of the key employment issues of concern to SMEs (Time for Business, 1997). These businesses viewed OHS regulations as technically complex and recognized that they did not possess the skills and expertise to deal with it. The use of external consultants and professional advisers to manage OHS risks, even reactively to comply with legislation, was seen as an additional cost burden to the business.

Statistics of workers' compensation claims for all jurisdictions in Australia are reported under the National Data set. While it is widely acknowledged that incidents and injuries in SMEs are considerably underreported, the NDs shows that in SMEs with certain ranges of employee numbers, the cost of injuries was higher than expected.

OHS problems in SMEs are not very different from those in larger enterprises in similar industry sectors. Generally the problem lies in couple factors unique to the structure & function of the SMEs and that hinders OHS improvements in these workplaces.

*To whom correspondence should be addressed.

Factors affecting OHS in SMSs

OHS problems in SMEs were studied in different industries around Australia in the last decade (Caple, 1996; Mayhew, 1997). They showed a consistent picture on factors that affect health & safety in SMEs. Key findings were that most SMEs had little or no awareness of OHS legislation and associated regulations and low priority was given to OHS by the owner/managers. The studies recommended that providers recognise the special needs on how OHS information should be prepared & delivered to SMEs.

For example, a UK study (Rachel, 1998) showed hazard information from the regulator on manual handling risks was not suitable for SMEs and was often discarded as junk mail without even being read.

Limited legislative knowledge

Many SME operators are still not adequately of OHS legislation and limit their responsibilities to providing Workers Compensation insurance. The few who do are usually overwhelmed by the legal and technical content of the OHS Act, Regulations and associated Standards and Code of Practice. The way most of the OHS information has been provided has failed to provide them with a basic understanding of their legal responsibilities under OHS legislation.

With the focus on performance-based OHS risk management, SMEs now have a greater need to access information and services that provide practical solutions to their OHS problems. This paper presents two case studies to illustrate how a non-governmental OHS agency provides specialist services to SMEs in Sydney. The potential for this approach to tackle OHS problem in the SME sector is further discussed.

Materials and Method

The OHS Service

The Workers Health Centre (WHC) in Sydney is a non-governmental, not-for profit organization with over 25 years of experience in OHS and injury management. It was established in 1976 by a group of doctors and trade unionists to provide specialist occupational health services and hazard information for workers in Sydney's industrial sector. Today the THC has a medical clinic, audiometry and rehabilitation provides, together with a range of occupational hygiene services for cost-recovery fee.

An annual trade union affiliation fee and a great by the state Health Department to provide plain English OHS information to the community guarantee additional funding for the WHC.

Two workplaces

Two workplaces in the metal working industry were inspected by the OHS regulatory agency in NSW and by an authorized trade union official from the metal trades union. The first (WP1) was a metal products manufacturer employing about 50 predominately immigrant workers from Asia and the Pacific. The second workplace (WP2) was a metal and fiberglass product recyding and retailing enterprise with a workforce of about 40 young, poorly literate males.

The state OHS regulatory agency issued improvement notices to WP1 to control noise levels throughout the manufacturing area. An official from the metal trades union referred the employer to WHC for assistance in assessing and controlling the noise hazards. WP2 had to deal with risks from airborne contaminants in polishing, grinding and electroplating areas. A newly-appointed OHS Officer from WP2 contacted WHC for a quote in measuring exposure to these hazards.

Exposure measurments

The occupational hygienist at the WHC prepared an exposure assessment program that consisted of the following:

WP1 Noise assessment at 12 different metal working task locations; personal noise exposure measurements at two high noise source locations and contour mapping of noise levels on the shop floor.

WP2 Airborne is inspirable dust and fiber monitoring in the polishing/ grinding areas and personal exposure to nickel and chromium in the electroplating area.

Two noise dosimeters and a Bruel & Kjaer sound level meter were used according to methods for occupational noise measurements in Australian Standard AS/NZS 1269–1998 (Standards Australia, 1998).

A cyclone filter was used with a calibrated SKC pump to measure airborne fibers as per NOHSC method for sampling airborne synthetic mineral fibers (NOHSC, 1989). Nickel and Chromium were measure using charcoal filters connected to a calibrated SKC pump. Inspirable dust was measured with an IOM filter using a calibrated SKC pump.

Results

Workplace 1 (WP1)

Noise levels at different work locations (Table 1) and personal exposure results (Fig. 1) showed that noise levels in WP 1 exceeded the statutory occupational noise exposure limit of 85 dB (A) (Work Cover NSW).

Workplace 2 (WP2)

Nuisance dust levels ant WP2 exceeded national exposure standards (Worksafe Australia, 1994) with very poor housekeeping evident grinding area. There were high airborne of Nickel and Chromium in the electroplating area.

Table 1. Exposure noise in different task locations at workplace 1

Task and Equipment	Maximum noise leveling dB (A)	Average noise level leq60in dB (A)
Wire cutting Machine	99	91
Rolling and Threading Machine	104	103
Bar Feeder	102	97
Bar Bundle Loading	90	87
Threading and Cutting Machine	106	91
Rolling Machine	104	90
U-bending Machine	96	85
Cropper Machine	96	93
Pincer Forming Machine	96	95
Small Threading Machine	100	96

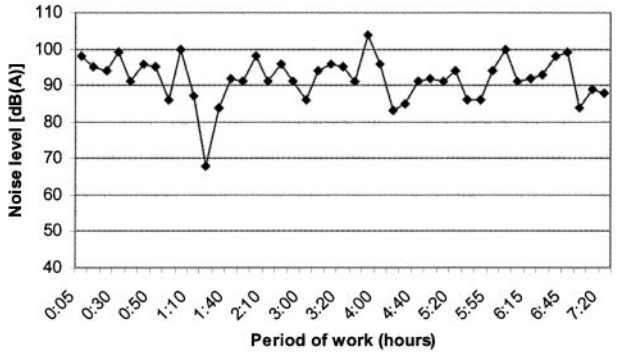

Fig. 1. Noise exposure was always over 85 dBA (example of personal dosimeter reading).

Airborne fivers in the fibers in the fiberglass polishing area were also above the national exposure standard for synthetic mineral fibers (SMF).

Remedial measures

The WHC provided a report to each workplace with the findings and recommendations for control measures. It also offered assistance with hazard in information sessions for their employees. The two workplaces responded differently.

Workplace WP1

Short presentations including a noise awareness video & talk were given to small groups of employees as well as to the family owners of the SME. Recommendations for noise control included replacing the aged rolling and threading machines with low noise new technology, regular maintenance of all machinery and replacing parts, areas with high noise machinery.

The SME owners concluded that replacement of machinery and parts would involve significant changes to the operation and process and was not cost-effective. Therefore, the use of personal hearing protection was continued as the preferred method of noise control. However, the exposure assessments and the noise awareness sessions appeared to have increased the employers' and the workforce's understanding of noise hazards. A PPE program commenced at the SME to select suitable ear muffs and to enforce its use in high noise areas, which were now prominently identified with signage.

Workplace WP2

The WHC report recommended that firstly, the SME improve housekeeping in the polishing areas and consider improved ventilation to control airborne contaminants. It also offered a series of hazard information sessions on safe handling of hazardous substances and on noise hazards (in plain English and in Chinese and Vietnamese languages) for the young, multilingual workforce.

The WP2 management instead considered a number of high cost control measures. These included the installation of a state-of-the art, imported local exhaust ventilation (LEV) system for the polishing room. However, recommendations to provide information sessions as provided to WP1 were not implemented by the partnership of WP2 owners.

The OHS Officer at this SME was recruited to deal with the plethora of notices issued not only by the OHS regulator but also by the environmental regulatory agency. A few months after the WHC program, the OHS officer position was terminated and the SME was vacating the premises to relocate to another area in Sydney.

Discussion

The exposure assessment program provided by WHC appears to have assisted WP1 to deal with the noise problems at that workplace. The cost was less than third of what a commercial consultant would have charged and also had the added benefit of an information "package" for its staff. However, WP2, which had multiple hazard problems, combined with a poorly trained and informed workforce, was unable to benefit from that approach.

This difference in response by the two SMEs support key contributing factors identified by studies such as Mayhew and Caple. That is, the low priority given by many SME owners when dealing with OHS issues and their failure to understand the risk management process. The removal of the OHS officer in WP2 before the hazard control measures were even implemented was a case in point. These two case studies further illustrated the inherent barriers for OHS improvement in SMEs.

A pilot project of an experimental OHS centre set up in Israel (Pines, 1992) showed that the most widespread occupational hazard in the study district was exposure to uncontrolled noise. They found that most small and medium-sized workplaces did not meet legislative requirements and that regular visits by safety technicians to these workplaces

Table 2. Exposure to chemical and physical hazards at workplace 2

Hazard	Average exposure levels	National Exposure Standard (Work safe, 1994)
Inspirable dust from grinding	32.8 mg/m^3	10 mg/m^3
Nickel from electroplating	0.15 mg/m^3	0.1 mg/m^3
Chromium from electroplating	0.08 mg/m^3	0.05 mg/m^3
Airborne fibers from polishing	0.4 fibers/ml	0.1 fibers/ml

Table 3. Cost of Exposure assessment program by WHC

	WP1	WP2	Commercial consultant (approx.)
Noise exposure			
Chemical exposures	–		
Dust and fiber exposures	–		
Report & presentation			
Total cost	A$ 750**	A$ 950	A$ 3500

** For comparative purposes, the average weekly income for a process in Australia is approx. A$ 500.

had positive impacts on their safety situation.

With performance-based OHS legislation, there is a greater need now for hazard assessment services for SMEs and for assistance to develop their capabilities in systematically managing OHS. Meanwhile, the capabilities of OHS agencies in developed economies to provide these services have reduced dramatically in recent years. In addition, the pool of skilled occupational hygienists is rapidly diminishing in countries like Australia.

The Australian Federal government has recently pledged to provide roving state-funded OHS advisors to assist SMEs in managing OHS. This is viewed in suspicion by trade unions as part of an industrial relations agenda to undermine trade unions' role in OHS improvement. This scheme also does not appear to provide any technical services to SMEs or improve the skills of persons in SMEs in Australia. This model should be further explored, with remedial measures and action taken by the SMEs monitored and evaluated aner a period of time.

This approach can be taken in those developed economies with growing numbers of SMEs as well as in the lesser-developed economies. It should be given attention by regulatory agencies and international labour partnerships that are involved in promoting programs to improve working conditions in that sector.

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