Work and stress among supervisors in selected industries in the context of a globalized labour production

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Abstract

This research aims to elucidate data on occupational factors among supervisors in manufacturing industries and associated health problems in the Philippine setting. The sample consisted of 23 establishments and from this, 47 supervisors were taken, and interviewed using survey questionnaires and focus group discussions. Among the 47 supervisors, 51% were from garments industry while 49% from electronics industry, and 66 % were women. Work among supervisors was reported to be challenging and stimulating but regular upgrading of skills was needed. Based on the personal interviews conducted among the supervisors, the issues in the workplace included information overload, keeping abreast with developments in their fields of expertise, the need to be multiskilled, stress brought about by information technology, the new pedagogy in the workplace affecting occupational stress, stringent computer-based supervisory monitoring (delete this please), and the need for new organizational strategies. On logistic regression, occupational stress among supervisors was found to be significantly associated with heavy load stress, mental requirements of work, massive technical/office work, and the use of microelectronics equipment needing concentration and literacy in IT, and regular upgrading of skills. Based on these findings, we can conclude that occupational factors play a significant role in influencing the health of supervisors.

Key words: stress among supervisors, electronics and garment industries, information technology, occupational health and hazards, organizational factors

Introduction

In the light of global industrialization, much focus is given on occupational factors and their influence on the health and safety of workers and supervisors. Many studies had covered occupational health in relation to injury rates, disease risk, hazard exposures, or worker (and manager) knowledge of OHS and regulatory responsibilities. Others studies dealt with retrenchment and outsourcing where 90% of these studies were negatively correlated with occupational health and safety. the association between precarious employment and occupational health (Quinlan, et. Al., 2001). This study shows attempted to look into precarious employment as a result of global economic changes in the workplace leading to occupational stress among supervisors. Otehr studies have also identified occupational factors in the development of occupational stress and otehr related health symptoms among employees (van Vegchel, et al., 2001; Mironov, et al., 1994; Melamed, et al. 1999).

This research aims to elucidate data on occupational factors among supervisors in manufacturing industries and associated health problems in the Philippine setting. The results of this study will add to the growing literature that document the occurrence of occupational illness

and its association to job-related factors. The most important aspect of this project is its eventual implications for policy and program formulation and industry evaluation.

The International Labor Organization (ILO) in 1984 defined psychosocial problems in the workplace as interactions between and among the work environment, job content and organizational conditions that may affect perceptions and experiences of health, work performance, and job satisfaction (ILO, 1998). Indeed, the health effects of work hazards and organizational factors include a wide variety of physical and pychophysiological disorders that impair human well-being and hamper his/her ability to carry out responsibilities both at work and at home.

The objective of the study was to investigate organizational processes in affecting occupational stress of supervisors in electronic and garment industries.

Methods

This study was a cross sectional study using stratified sampling technique in export processing zone in the Philippines. Export zones are special social and economic enclaves where government gives special incentives to investment portfolio such as income tax holidays, and free tariffs and duties. Industry type was either electronic or garment industries, representing modern and more traditional industries respectively. Industry size was based on the classification provided by the Department of Labor and Employment (DOLE): small scale industries had less than 100 employees; medium scale had 100–199 employees, and large scale had 200 or more employees. This study sampled 23 establishments and from this, 47 supervisors were taken. Occupational health and stress was measured through self-assessment of health by supervisors. Data were encoded using SPSS program. Summary and inferential statistics were used.

The focus group discussion (FGD) (Two-phased- 11 FGDs in all) was composed of 6–7 supervisors. The discussion was characterized by three phases starting with the warm-up stage then the elaboration stage where interviews and discussions were conducted , and then finally, the cool down stage to summarize and validate resulst of the FGD.

The ethics of research was followed such as informed consent, confidentiality of data and information, and feedback. The results of the study will be shared with respective industries in the form of a summarized data through a tripartite consultation with government, non-government organization and the academe.

Results

From a total of 23 industries, 13 were electronics- and 10 were garment industries. Among the 47 supervisors, 51% were from garments industry while 49% from electronics industry, and 66% were women. Although the females outnumbered the males, more males were placed in managerial jobs and higher positions. More than half of the supervisors were married

(80.7%) and 28% have one child. This shows that the supervisors are still in their young adulthood and beginning to start their careers.

The new technologies and computer-aided facilities(please delete red) used by the sample industries in this study were: computerized decision support systems, computer information systems, computer aided design (CAD), computer aided manufacturing (CAM), computer integrated manufacturing (CIM), computer numerically controlled machining (CNC), mechanized product systems such as conveyor belts and workstations, and robotics.

Information technology-based devices and programs were used more by electronics than garments, except for application of computer aided design (CAD) among the garments industry. Component parts production (60.9%) in electronics showed that this type of production is relegated to developing countries while more skill- and technology-integrated processes are done in the industrial countries. Very few of the respondents were involved in design, research and development, which are the phases in the production process commonly relegated to first world countries.

Work among supervisors was reported to be challenging and stimulating (52% in electronics and 75 in garments) but regular upgrading of skills was needed (52% in electronics and 37.5% in garments) .

On the value of work, the supervisors in the electronics industry reported that they gained confidence to assert themselves (70.8%), gained personal strength (58.3%), and gained meaning in their life (54.2%). The same pattern can be seen among supervisors in the garments industry accounting for 77.3%, 63.6%, and 36.4% respectively for the abovementioned benefits of work. See Table 1.

Table 1. Supervisor's perception of the benefits of work across industry type.

Benefits of Work *	**Electronics (N = 23)**		Garments (N = 24)	
	Freq.	%	Freq.	%
Work gave personal strength	14	58.3	8	36.4
Work gave meaning to their life	13	54.2	14	63.6
Gave freedom to make decisions at home	7	29.2	5	22.7
Gave freedom to decide with regards to children and family	6	25.0	5	22.7
Gave confidence to assert oneself and disobey husband if the worker feels he is wrong	17	70.8	17	77.3
Helped the family	4	16.7	3	13.6

*Total=47; This is multiresponse which means that a supervisor may have more than one of these categories.

For the frequency distribution of illnesses among supervisors, the more prevalent illnesses in the electronics were headache and coughs and colds (62.5% each), followed by eye problems (37.5%) and then UTI (20.8%). In the garments industry, the more common ones were headache (86.4%), and then coughs and colds (50%), UTI (27.3%) and skin allergy (18.2%). The above illnesses lead to sickness absenteeism. The national data reveal that an average of 5% of the workforce is absent from working every day. This may vary from 2% to 10% depending on the sector, type of work and management culture. The occupational safety and health management system of the enterprise is in a key position to reduce these absences caused by illnesses and risk factors at work.

Factor analysis of certain variables

Factor analysis was used to look into clustering of related variables. This was done for the reduction of data set to allow a more parsimonious analysis. For the task autonomy, two factors emerged: performance evaluation as factor 1; and planning and job enrichment as factor 2. Performance evaluation is the more traditional function of the supervisor while factor 2 is part of the newer approaches to supervision, which includes more participation in decision making related to company goals and company products (Table 2).

Table 2. Factor analysis on task autonomy in decision areas for supervisors.

Factors on Task Autonomy	Rotated Component Values
Factor 1: Traditional supervision	
Performance evaluation	.749
Sanctions for salary	.646
Stops salary increase	.640
Given expulsion or suspension	.793
Given formal warning	
Factor 2: Participatory supervision	
Planning and job enrichment	.980
Participation in bench marking	.964
Goal contribution to design, etc.	

In terms of the application and use of information technology, factor 1 refers to the areas of application outside assembly line and mainly handled by supervisors and technical people. Factor 2 on the other hand refers to IT use and application in the assembly line work itself (Table 3).

Table 3. Factor analysis on uses of information technology for supervisors.

Factors on Use of Information Technology	Rotated Component Values
Factor 1: Technical/Office work	
Design	.802
Quality control	.711

Sales and marketing	.721
Research and development	.726
Accounting	.818
Management and supervision	.793
Factor 2: IT application in assembly line work	
Fabrication of model products	.540
Sales and marketing	–.740
Management and supervision	

For the line of production where information technology is integrated, there were two factors that emerged: factor 1 is related to IT as applied in production and factor 2 is related to IT application in the assembly line work (Table 4).

Table 4. Factor analysis on line of production for supervisors.

Factors on Line of Production	Rotated Component Values
Factor 1: IT application in production	
Design	.721
Assembly of whole products	.799
Assembly of component parts	–.655
Factor 2: IT application in assembly line work	
Fabrication of model products	.540
Sales and marketing	–.740
Management and supervision	

Logistic regression differentiating electronics and garment industries and industry sizes

Supervisors in the electronics industry were more likely to be involved in benchmarking and design of organizational goals than those in the garment industry. The two also differ in the extent of their IT use; the electronics sector was 4.45 times more likely to use IT in the production process. The use of IT among supervisors was also found to be associated with an increased opportunity to participate in the overall organizational structure and decision making processes (Table 5). In contrast, the garment industry was 31% more likely to be characterized by heavy load pressure.

It was seen that supervisors employed in large industries used more IT in the production process and had more challenging and stimulating work. They were also required to perform tasks that necessitated the use of greater concentration and skills. On the other hand, supervisors in the garments industry were found to have more personal strength, greater freedom to make decisions on family matters and were more able to assert their ideas (Table 6).

Table 5. Comparison between electronics and garments industries (supervisors).

Industry Type	Coefficient	Odds Ratio	Standard Error	[95% Confidence Interval]		Remarks
Task Autonomy						
Performance Evaluation	–1.72	0.18	0.69	–3.07	–0.38	Supervisors in the garments industries tend to issue formal warnings to workers and give sanctions such as expulsion or suspension and stoppage of salary increase more often than supervisors in the electronics industries.
Planning and Job Enrichment	1.38	4.01	1.85	8.01	0.76	Supervisors in the electronics industries have more involvement in benchmarking, goal contribution to design
Line of Production						
IT in Production	1.70	5.45	0.68	0.37	3.02	Supervisors in electronics industries makes use of Information Technology more than supervisors in the garments industries
Physical Health						
Work-specific illnesses	5.75	3.37	3.45	–1.01	12.51	Supervisors in the electronics industries experience work-specific illnesses such as allergies and reproductive health problems .
Undifferentiated illnesses	2.25	9.52	1.32	–0.33	4.84	Supervisors in the electronics industries experience undifferentiated illnesses that may be caused by the general environment such as headaches and cough and cold.
Work Description						
Heavy Load Pressure	–1.17	0.31	–2.33	–2.3	0.00	Heavy load pressure is felt more by supervisors in the garments industries
Constant	–1.60		–3.72	–3.72	0.53	

Note: * – significant at the 5 and 10 percent levels of significance.

Table 6. Comparison among supervisors in small, medium and large industries.

Industry Size		Coefficient	Odds Ratio	Standard Error	[95% Confidence Interval]		Remarks
Constant	s/m	–1.58		1.89	–5.29	2.12	
	l/m	2.65		0.79	1.11	4.19	
	s/l	–4.23					
Effect of Work on Supervisors							
Self-autonomy to choose	s/m	–2.56	0.08	1.65	–5.79	0.67	Supervisors in medium industries have more personal strength, exercise more freedom to make decisions at home and decide with regards to family matters and women have more confidence to assert their ideas to their husbands
	l/m	–0.58	0.56	0.73	–2.02	0.86	
	s/l	–1.98	0.14				
Uses of Information Technology Uses of Information Technology							
Assembly Line	s/m	1.20	3.33	0.91	–0.58	2.99	The use of information technology is higher for large industries
	l/m	0.05	2.84	0.66	–0.26	2.35	
	s/l	1.16	1.17				
Work Description							
	l/m	0.98	7.26	0.85	0.33	3.64	

Note: * - significant at the 5 and 10 percent levels of significance.

Logistic regression of factors that contribute to occupational stress among supervisors

Supervisors who find their work to need concentration and literacy in IT, and regular upgrading of skills are likely to find their work to be stressful. Work, however, is not stressful to supervisors involved in technical work or office work. On the other hand, supervisors who used microelectronic equipments in production were stressed. Work is also mentally tiring for supervisors who find their work to be of heavy burden to them, fast-paced, and swamped with workers and workload (Table 7).

Table 7. Factors that contribute to occupational stress among supervisors.

Occupational Stress Risk Factors	**Coefficient**	**Odds Ratio**	**Standard Error**
heavy load pressure (heavy burden to them, fast-paced, and swamped with workers and workload)	2.79	1.06	0.06
mental requirements	2.69	1.07	0.07
technical/office work	–2.04	0.69	9.03
use of microelectronics	2.33	10.25	14.29

equipment (needing concentration and literacy in IT, and regular upgrading of skills)		
constant	–2.57	1.10

FGD results

Focus Group Discussions (FGD) interviews were also conducted among the supervisors. Results of the interviews showed the following.

The supervisors interviewed in this study reported of many new challenging issues at work such as the introduction of information technology, the need for upskilling, multiple work, and new hazards arising at work.

The supervisors said that work has become more challenging with the introduction of information technology. They said that fast communication causes pressure among them. There is a need to submit reports and make programs frequently, deal with work issues and implement innovative changes to make the company competitive in the global market. "We have multiple job titles, such as line engineers, and at the same time, safety officer and quality inspection officer, without commensurate increase in salary. This is stressful for us. Besides, the pressure to keep up with new IT in the workplace is also stressing us.There is so much work to do, too much expectations, and too many responsibilities."

The supervisors reported information overload because of the need for multiple skills in dealing with IT, and the demands of market competition to always be on the top of the business. The supervisors also had a perception that if they did not upgrade their knowledge or have more skills in relation to IT, they might eventually lose out to newer graduates more adept in computer and IT work. They had to be connected with international and local professional organizations to learn new strategies and techniques in their fields.

In the garment industries, the economic crisis led to retrenchment of workers which the supervisors had to deal with. Workers became angry with them for losing their jobs. With a leaner workforce, the previous tasks of those who were retrenched were absorbed by the remaining workforce. Retrenchment was attributed to the elimination of protective tariffs on textiles and garments in the country. Steep competition is evident in the case of production of garments from China and otehr Asian countries. Sometimes, the company is temporarily closed for a season when there are no orders from the international market, then reopens when orders come in. This makes their labour, both of the workers and supervisors, very precarious, and contingent on market demand. The volatility of the global market translates into precariousness of their work. In order to also keep cost of production down, supervisors reported that management contracts out or subcontracts certain tasks instead of employing regular workers.

The supervisors in the electronics industries also said, “The flow of information daily is voluminous. We communicate with our managers not on a face to face interaction but through video and teleconferencing. There is also interfacing now with more clients , customers and other technical people through the internet.”

Work intensification was also reported because work could not be done in the regular 8 hour workshift. It was not unusual, according to them, to extend additional 2 to 4 hours a day.

The response of supervisors on IT introduction in the workplace is varied. Although IT gave them higher job autonomy and challenging tasks, there was work intensification and multiple responsibilities. Although work was facilitated by IT and enabled their companies to stay in the global market, many of their collegueas and their workers were retrenched to cut down on labor cost, aggravating further work overload.

Discussion

The study has shown certain adverse health issues such as stress among supervisors in the workplace with the accommodation of information technology, and from the organizational changes arising from the need to accommodate global market demands. In this study, these factors seem to have contributed to occupational stress experienced by supervisors. This may as well also lead to increased national prevalence of occupational illnesses and injuries. When the U.S. Bureau of Labor Statistics and workers' compensation insurers reported dramatic drops in rates of occupational injuries and illnesses during the 1990s, Azaroff, et.al. (2004) argued that this was not tenous because the Labor Statistics failed to incorporate rise of precarious employment, falling wages and opportunities, and the creation of a super-vulnerable population of immigrant workers. Other cited reasons were lack of opportunities for migrant and illegal workers to report injuries and illnesses, loss of access to health care for growing numbers of workers, and increased obstacles to the use of workers' compensation. It is therefore necessary to investigate all these factors occurring in the new laborforce to capture the true state of occupational health and safety even among supervisors.

The data has shown that significant associations exist between certain occupational factors, organizational factors and occupational stress among supervisors. Perception of psychosocial risk at work was evident among the supervisors in this study. Smith in 2001 said that crucial for understanding the logic behind different risk perceptions is how people think about a hazard and organise information about it. In this study, supervisors formed a perception of risk and hazards at work, both physical and psychological.

Some studies have explored the interaction between occupational factors and psychosocial problems and disability.Hazards at work can lead to occupational injury and then subsequently to disability (Morris, 1999). This study however did not explore disability arising from occupational stress and psychosocial problems. This study however warns of the possible adverse effect of ocupational stress to work productivity and disability claims. The need for an evidence based occupational helath studies was underscored by Hulsof, et.al., in 1999, including

the need for rehabilittaion activities related to occupational illnesses. Rehabilitation should not only mean physical therapy interventions but also mental health rehabilitation.

This study showed unfavorable work conditions among supervisors in the new age of information technology including work overload and multitasking. In similar developing economies such as India, the impact of globalization of production has been documented, however, among workers. It stated that Indian women in a society that has experienced economic growth post-1991 have demonstrated an inability to generate "quality" employment for much of its labor force. The article by Swaminathan in 2007 showed fthe plights of Indian women workers especially in the area of remuneration for work and the costs to their health and well-being.

Based on the FGDs conducted among the supervisors, the issues in the workplace included information overload, keeping abreast with developments in their fields of expertise, the need to be multiskilled, stress brought about by information technology, and the need for new organizational strategies. Supervisors reported that while IT has facilitated their work, it has also intensifed their tasks and led to more stress.

Occupational illnesses and stresses can be prevented. This was reiterated by London and Kisting in 2002 who said that the number of preventable occupational health and safety (OHS) tragedies occurring in the workplace requires an ethical practice for health and safety policies and practices. These ethical concerns involve equitablle distribution of resources, ethically acceptable global standards for OHS for all workers, and duty of care of management. global ethical standards in international OHS. The same must be pursued in the Philippines in order to come up with work policies favorable to both workers and supervsiors.

This study suggests priority research directions including social epidemiological research to determine risk factors associated with hazardous occupational exposures, and risk behaviours aggravating occupational illness and injuries. It should also inlcude what other researchers have suggested on the development of appropriate tools, and scientific tools at that, for intervention in the workplace (Sorensen and Barbeau, 2006).

Conclusion

This study has demonstrated the presence of significant associations between certain work-related factors and the occurrence of occupational stress among supervisors. On logistic regression, occupational stress among supervisors were found to be significantly associated with heavy load stress, mental requirements of work, massive technical/office work, and the use of microelectronics equipment needing concentration and literacy in IT, and regular upgrading of skills.

Based on these findings, we can conclude that occupational factors play a significant role in influencing the health of supervisors. The type of size of industries also influence organizational factors at play in the workplace. With this knowledge, we can design strategies and programs for the promotion of occupational health and well being of supervisor sin manufacturing industries.

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