A Study on the Comprehensive and Integrated Workplace Safety and Health Services in Singapore

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Objectives: The aim of this study was to evaluate the level of comprehensiveness and integration of workplace safety and health (WSH) services (safety, occupational health, and well-being) in Singapore. Methods: Thirty workplaces from five different sectors comprising more than 28,000 workers were assessed using five custom-developed tools. Results: One quarter of the workplaces have applied the principles of comprehensive and integrated WSH. Among those that managed WSH comprehensively, workers were 4.4 times (95% confidence interval [CI], 2.33 to 8.25) more likely to be proud to work for their company, 7.4 times (95% CI, 3.96 to 13.90) more likely to be satisfied with their current job, and 1.7 times (95% CI, 1.21 to 2.32) more likely to balance the demands of work and home. Conclusions: There is a need to enhance awareness and education on comprehensive and integrated WSH in Singapore companies.

Health protection and health promotion activities in both the workplace and the national level have traditionally operated independently of each other. Health protection encompasses activities that protect workers from occupational injuries and diseases, ranging from basic safety training to the use of personal protective equipment. In contrast, health promotion encompasses activities that maintain or improve the personal well-being and health of a workforce. The two domains are often housed in distinct entities in workplaces, leading to overall ineffectiveness due to the “silos” created around these activities. Occupational safety, occupational health, and health promotion services for well-being and health, if present in a company, often coexist with little or no interaction or sharing of information and expertise. Currently, most workplace health protection programs (safety and work environment) are separated from workplace health promotion programs (wellness and disease management).1

In 1984, the National Institute for Occupational Safety and Health (NIOSH, Atlanta, GA)2 recommended that “simultaneously addressing worksite occupational safety and health and worksite health promotion would make possible a ‘synergism of prevention’ to improve the health of workers through comprehensive risk reduction.” Since then, considerable evidence has supported the potential benefits of integrating occupational health and safety and worksite health promotion, both for the organization and the worker. A comprehensive and integrated approach to manage workplace safety, health, and wellness means to provide and maintain a safe, healthy, and conducive working environment for all employees, as well as identifying and addressing workplace safety and health (WSH) risks in a proactive and integrated way with active participation from both employers and employees. For example, more than two decades ago, Johnson & Johnson developed a health and wellness program integrating employee health, wellness, disability management, employee assistance, and occupational medicine programs with a special focus on a shared services concept. To reduce the silo effect between departments and promote cross-utilization of resources, administrative systems were established. Since then, their financial impact studies have found reductions of about US$8.6 million per year in employee health care and administrative costs.4 Other companies such as Citibank have also described benefits after implementation of integrated WSH programs.5

The four most commonly used models for comprehensive and integrated WSH are the World Health Organization (WHO) Healthy Workplace model,6 the NIOSH Total Worker’s Health model,7 the Canadian Centre for Occupational Health and Safety (CCOHS) Workplace Health model,8 and the Harvard School of Public Health Centre for Work, Health and Well-being’s Safe Well Integrated Management System (SIMS) model.9 The WHO Healthy Workplace model focuses on four main areas to address workplace health—physical work environment, psychosocial work environment, personal health resources in the workplace, and enterprise community involvement.6 The NIOSH Total Worker’s Health model aims to address the wide range of factors that influenced workers’ total health and is supposedly a more “comprehensive” concept than a pure integrated approach.7 Integration is one of its aims, but the focus is to examine a broad scope of employment, workforce, and workplace factors to strengthen national policies, programs, and practices to better protect and promote worker health.7 The CCOHS Workplace Health model focuses on the general population at the workplace and the organization as a whole and serves to address a broad range of health issues at the workplace including physical, psychosocial, environment, health practices, and personal resources through programs, policies, and practices.8 The concepts are similar to the WHO Healthy Workplace model, except for the absence of enterprise community involvement. The SIMS model is similar to the NIOSH model.

The construction of the Olympic Park and Athletes’ Village in the United Kingdom provides a successful example of how these models can be used to integrate occupational health and safety with worksite health promotion. The occupational health services provided not only illustrate how good practice can assist management to meet legal obligations, but also showcased a comprehensive and preventive occupational health service for all workers that has been widely viewed as one of the best to be operated on a major UK construction site to date.10 Singapore is facing an aging population. To encourage the elderly to stay in the workforce, the retirement age has been increased. The prevalence of chronic diseases in the workforce is expected to rise. There is thus an increasing need for comprehensive and integrated WSH services to both protect and promote the health of the workforce in Singapore. Although the models from the WHO, NIOSH, the Canadian Centre for Occupational Health and Safety, and the SIMS could provide useful learning points, we are not aware...
of the actual state of occupational health services that are available among the workplaces in Singapore. This study aims to describe the comprehensiveness and integration of WSH services among certain workplaces in Singapore.

METHODS

Study Population

Thirty companies from five different industries (ie, manufacturing, construction, marine, service, and pest control) were invited to participate in the study. One company declined the invitation. This was replaced by another backup company. As convenience sampling was used (ie, companies took part on a voluntary basis) the findings from this study are not representative of the respective industries.

Development and Administration of the Three Custom-Developed Tools

For the purpose of this study, three tools were custom developed—the Workplace Safety & Health Services (WSHS) Questionnaire, the Workplace Safety and Health 360 Questionnaire (WSH360), and the Basic Health Survey (BHS). Each company in this study had to complete all the three tools.

First, the formation of the WSHS was originally derived from a preliminary WSH services questionnaire used in a small-scale pilot study conducted by the Ministry of Manpower before the commencement of this study. 11 The main purpose of the WSHS was to assess the basic elements of the WSH Management System through the 11 activities of the Basic Occupational Safety and Health guidelines. 5 This is a self-administered questionnaire filled up by the human resource (HR) personnel of the company, in consultation with health and safety personnel or any other person deemed necessary in their companies. The WSHS asked the company if the three elements of safety, health, and well-being (SHW) were in place and also how well the three elements were integrated through the company SHW committee’s activities and initiatives. The questionnaire also determines whether the SHW committee is one or there are separate committees for SHW.

Second, the WSH360 was developed after a series of qualitative interviews with staff from different levels of 20 different companies (not part of this study). 11 Information was collected on various domains pertaining to workplace health, safety, and well-being identified through literature review. After qualitative data analysis, a structured and objective tool was developed, pilot-tested, and refined. Five individuals from each company had to go through the WSH360. The WSH360, incorporating both the qualitative and quantitative format, was administered via face-to-face interview of one person each from the stakeholder categories of senior management, HR, safety officer, on-site medical doctor or nurse (where available), work supervisor, and worker, respectively, in each company. These interviewees have to be in full-time employment with the company for at least 1 year. Although the questions for the interviewees are posed in a qualitative manner, the interviewer is given a set pattern of answers that he or she should expect and indicate the responses under. The interviewees selection was not random because it was selected over five stakeholder categories of a company so one can have a broad view of WSH for the whole company. The purpose of the WSH360 was to obtain interviewees’ perceptions of WSH from various levels in the organization, to understand the experience of WSH in their own organizational level and function, to reveal differences between the different levels in their experiences and understanding of WSH, and to identify obstacles faced in implementation of WSH services. Most large organizations, including government agencies and nonprofit organizations, utilize multirater feedback to assess their employees at the individual level as part of talent management and performance appraisal exercises. The WSH360 adapts this concept to measure the performance (or the areas they are underperforming) of the organization as an entity in safety, health, and wellness.

Third, the BHS was adapted and combined from existing validated tools in the literature. This survey tool was mainly adapted from the Health Practices Survey, which was originally developed by the Health Promotion Board in Singapore to help companies survey their employees’ baseline health status as part of workplace health promotion programs. 12 The Health Practices Survey was deemed an appropriate instrument to use for this study because it had been validated and designed for use in the local setting. 12 Questions on musculoskeletal symptoms were extracted from the validated SF-36 from Qualysetric 13 as well as the Standardised Nordic questionnaires. 14 The BHS is essentially a health needs assessment tool used to capture the baseline health status of employees. Data collected included basic demographic information, height, and weight to calculate body mass index (BMI), presence of chronic diseases, previous basic health screening, stress level, lifestyle-related practices and habits, perceived work environment, and symptoms of musculoskeletal disorders. The Asian categories for BMI classification based on the WHO recommendation were used. 15 Data collated from the BHS can be used to gauge the health needs of the particular company.

The BHS was administered on employees who were working full-time for at least 12 months. Part-time staff, temporary or contract employees, employees not directly employed by the company, and full-time employees working for less than 12 months were excluded from the BHS. For companies with 500 or less employees, all the employees were asked to complete this survey. Nevertheless, for companies with more than 500 employees, the BHS was administered to a random sample of 500. This self-administered survey took approximately 10 to 15 minutes to complete.

Statistical Analysis

Data analysis was performed using STATA version 11 (Stata-Corp, College Station, TX). 16 A composite data set was created by merging the BHS, WSHS, and WSH360 data. This was to allow for comparison of selected company characteristics such as senior management involvement in health and safety with worker characteristics such as health and work perception. Only selected factors in which there were differences among the companies were used for meaningful analysis. Variables that were dropped because of uniformity (ie, all companies answered “yes” to this question in the WSHS) included—reporting of dangerous occurrences, of near misses and work-related injuries; provision and periodic maintenance of first aid facilities; emergency response training; and identification of workplace hazards. Not surprisingly, all the dropped variables were actually legal requirements, whereas those that varied between companies were voluntary practices. The basis of the comparison made was between a company’s voluntary health practices versus its health outcomes (using self-reported perception of workers on whether work affected their health positively as a surrogate).

The relationship between having all three elements of safety, workplace health, and well-being (referred to as having “comprehensive and integrated WSH”) in a company and worker job perceptions was examined. Logistic regression model was used, and potential confounders, namely, age, sex, and ethnicity of the workforce across the industries were adjusted for. 17 For the purposes of this analysis, comprehensive and integrated WSH was defined as having both fitness to return to work examination after prolonged medical absence and orientation on safe and healthy work practices, as well as at least one program related to wellness or general health (including general health

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screening, smoking cessation, nutrition, exercise, mental health, chronic disease management, and alcohol or substance misuse screening). If a company conducted orientation on safe and healthy work practices, and fitness to return to work examinations after prolonged absence for health reason, this was regarded as a company with a “higher-order” WSH functioning as this is not required by law. Most companies indicated “yes” on the WSHS questionnaire for having in place legally required WSH elements such as identification of workplace hazards and having a committee overseeing safety; thus, these parameters were not included in the analysis.

RESULTS

Basic Elements of the WSH Management System

Thirty workplaces participated in the study, of which half of them were from multinational companies (MNCs). The size of the companies varied depending on the industry (Table 1). Most of the companies complied with the statutory requirements for WSH. Few companies (4 out of 30; 13%) took into account any cost-benefit analysis (CBA) when implementing WSH and health promotion programs. Although many companies (21 out of 30; 70%) had some form of health promotion activities, it was not well integrated into WSH. Eight out of 30 companies (about 25%) had comprehensive and integrated WSH by the study definition.

Health Status of the Workers

In total, 9285 (n = 11,282) completed questionnaires were received, representing a total response rate of 82%. More than half of the companies achieved response rates of more than 80%, with 14 companies having more than 90% responses.

The prevalence of respondents who were overweight (BMI cutoff 23 to 27.4 kg/m² corresponding to the WHO recommendation for the Asian population) was highest in the marine (42.8%), followed by the service sector (25.3%), obtained from NHS 2010, as shown in Table 2.

Among the manufacturing companies, the within-company gaps were less pronounced (the most obvious was training in wellness, 48.4%), but scores on wellness (54.0%) still lagged behind safety (71.8%) and health (66.8%). The difference in scores between safety and wellness was 18.7%. The areas of concern for the service industry included lack of goals and objectives for health and wellness, the presence of goals and objectives for health and wellness, lack of operational and management committees for wellness, insufficient rewards/disciplinary action for health and training in wellness. This suggests that the most needed intervention among companies in the service industry will be to set up organizational structures and comprehensive programs in wellness.

In general, the pest control industry scores lagged behind the other industries. The radar diagram showed several areas that were lacking—presence of goals and objectives for health and wellness, existence of operational and management committees for wellness, rewards for wellness, in addition to training on wellness.

Composite Assessment

Table 3 shows the relationship between selected company characteristics and worker job perceptions. As 27 of 30 companies had WSH committees, there was not much difference in the job perceptions of workers between companies with and without WSH committees. Companies that conducted regular self-evaluation on the effectiveness of their WSH services had on average better employee job perceptions than equivalent companies that did not do so. Specifically, employees in these companies were 1.45 times more likely to report that they were proud to work for their companies, 1.33 times more likely to feel safe at their workplaces and 1.35 times more likely to be satisfied with their physical working environment. In addition, they were more likely to be aware of the need to report unsafe working conditions and be assured that corrective action would be taken by management (1.37 and 1.25 times, respectively).

### TABLE 1. Distribution of Study Population by Industry, Size, and Type of Companies

<table>
<thead>
<tr>
<th>Industry</th>
<th>Number</th>
<th>Size Range (Median)</th>
<th>MNC</th>
<th>JV</th>
<th>Local-Overseas</th>
<th>Local</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>10</td>
<td>91–4,724 (870)</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Construction</td>
<td>7</td>
<td>475–2,848 (752)</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Marine</td>
<td>5</td>
<td>89–4,109 (320)</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Service</td>
<td>4</td>
<td>142–421 (271)</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Pest control</td>
<td>4</td>
<td>35–502 (98)</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>28,379 (567)</td>
<td>15</td>
<td>1</td>
<td>8</td>
<td>6</td>
</tr>
</tbody>
</table>

JV, joint venture; MNC, multinational company.
TABLE 2. Overweight/Obesity and Chronic Disease Prevalence of the Workers by Industry

<table>
<thead>
<tr>
<th>BMI category (Asian\textsuperscript{a})\textsuperscript{,15} kg/m\textsuperscript{2}</th>
<th>Manufacturing (\textit{n} = 3,765)</th>
<th>Construction (\textit{n} = 3,003)</th>
<th>Marine (\textit{n} = 1,195)</th>
<th>Service (\textit{n} = 742)</th>
<th>Pest Control (\textit{n} = 579)</th>
<th>Overall (\textit{n} = 9,284)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight (&lt;18.5)</td>
<td>200 (5.3)</td>
<td>142 (4.7)</td>
<td>48 (4.0)</td>
<td>60 (8.1)</td>
<td>38 (6.6)</td>
<td>488 (5.3)</td>
</tr>
<tr>
<td>Normal (18.5–22.9)</td>
<td>1,392 (37.0)</td>
<td>1,231 (41.0)</td>
<td>377 (31.6)</td>
<td>277 (37.4)</td>
<td>210 (36.3)</td>
<td>3,487 (37.6)</td>
</tr>
<tr>
<td>Overweight (23.0–27.4)</td>
<td>1,296 (34.5)</td>
<td>1,094 (36.4)</td>
<td>511 (42.8)</td>
<td>216 (29.2)</td>
<td>164 (28.3)</td>
<td>3,281 (21.8)</td>
</tr>
<tr>
<td>Obese (\geq27.5)</td>
<td>874 (23.2)</td>
<td>535 (17.8)</td>
<td>257 (21.5)</td>
<td>188 (25.3)</td>
<td>167 (28.8)</td>
<td>2,022 (21.8)</td>
</tr>
</tbody>
</table>

Chronic disease

<table>
<thead>
<tr>
<th>Disease</th>
<th>Manufacturing (\textit{n} = 3,765)</th>
<th>Construction (\textit{n} = 3,003)</th>
<th>Marine (\textit{n} = 1,195)</th>
<th>Service (\textit{n} = 742)</th>
<th>Pest Control (\textit{n} = 579)</th>
<th>Overall (\textit{n} = 9,284)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart disease</td>
<td>38 (1.0)</td>
<td>44 (1.5)</td>
<td>21 (1.8)</td>
<td>11 (1.5)</td>
<td>5 (5.9)</td>
<td>119 (1.3)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>354 (9.4)</td>
<td>117 (3.9)</td>
<td>93 (7.8)</td>
<td>84 (11.3)</td>
<td>48 (8.3)</td>
<td>696 (7.5)</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>105 (2.8)</td>
<td>73 (2.4)</td>
<td>37 (3.1)</td>
<td>29 (3.9)</td>
<td>15 (2.6)</td>
<td>259 (2.8)</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td>449 (11.9)</td>
<td>100 (3.3)</td>
<td>79 (6.6)</td>
<td>80 (10.8)</td>
<td>33 (5.7)</td>
<td>741 (8.0)</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Asian categories for BMI classification based on WHO recommendation was used.\textsuperscript{15}

BMI, body mass index.

FIGURE 1. Perception and knowledge of safety, health, and well-being performance by industry.
TABLE 3. Relationship Between Selected Company Characteristics and Employee Job Perception (After Adjusting for Age Groups, Sex, Ethnicities, and Industries)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Compared With Workers in Otherwise Equivalent Companies Without Each Characteristic</th>
<th>How Many Times More or Less Likely Are Workers to Report:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Takes Corrective Action When Needed</td>
<td>Overall Satisfied With Current Job</td>
<td>P</td>
</tr>
<tr>
<td>HR in safety committee</td>
<td>Corrective Action When Needed</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Good integration in safety incident scenario</td>
<td>When Unsafe Working Conditions are Reported</td>
<td>0.001</td>
</tr>
<tr>
<td>Good inter-committee communication (WSH360 C4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Companies scored best if all safety incidents were recorded, and records were available to all parties (ie, senior management, HR, and not only WSH Officer), and incidents were discussed at safety meetings as well as operations meetings.</td>
<td>0.001</td>
<td></td>
</tr>
</tbody>
</table>

Likewise, the presence of senior management and HR personnel on the safety committee is positively associated with employee job perception. Employees were more likely to be proud to work for their company when either senior management or HR personnel were in the safety committee (1.55 and 1.70 times, respectively) and more likely to be satisfied with their physical work environment (1.13 and 1.21 times, respectively).

Overall, the results indicated that comprehensive and integrated WSH was beneficial for the companies—workers in companies with comprehensive and integrated WSH were 4.4 (95% confidence interval [CI], 2.33 to 8.25; P < 0.001) times more likely to be proud to work for their company and 7.4 (95% CI, 3.96 to 13.90; P < 0.001) times more likely to be satisfied with their current job. In addition, employees in these companies were 1.7 (95% CI, 1.21 to 2.32; P 0.002) times more likely to report being able to easily balance the demands of work and home life.

DISCUSSION

This study has indicated that the main focus of companies in Singapore has been on workplace safety and occupational health to fulfill legislative requirements. Most companies have failed to recognize the importance and usefulness of comprehensive and integrated WSH because only about a quarter of the participating companies have applied these principles in their organizations. Among those that managed WSH comprehensively, the workers were more likely to be proud to work for their company, expressed higher satisfaction with their current job and reported more likely to balance the demands of work and home life. Our findings also indicate that almost all companies could benefit from assistance to set up a database containing information on SHW. This database can be used to record and share information, which is an important aspect of integration. Other than being an important symbolic function for integration, the concomitant capture of interrelated information on health, safety, and well-being will allow the decision-makers or policymakers to have a more holistic view of the changes and developments in health conditions or safety performance of their organizations and workers.

Basic Elements of the WSH Management System

Almost all companies (both MNCs and small and medium enterprises) complied with the statutory requirement for WSH under the Ministry of Manpower legislations. It is surprising that among the MNCs in the study, the issue of CBA was not considered when implementing WSH and health promotion programs. These companies may not have the means to do a CBA or they might have regarded WSH and health promotion programs as part of operational costs.

Many studies have reported that workplace health promotion programs can generate positive returns on investment. In a 2012 meta-evaluation covering 62 studies, over a duration of 3.83 years and involving close to 2.1 million person-years of observation, Chapman19 concluded that workplace health promotion programs do have strong financial implications on reducing workplace absenteeism, health care costs, and workers’ compensation and disability insurance costs by around 25%. Similarly, Baicker et al20 reported in their meta-analysis of 22 workplaces that workplace health promotion programs generally contribute savings to medical costs and absenteeism cost by $3.27 and $2.73, respectively, per dollar spent on health promotion programs. Nevertheless, few have reported on return on investment from an integrated WSH approach that includes health promotion. Yet, in the case of the UK Olympic Park and Athletes’ Village, a CBA indicated that the provision of treatment, preventive health services, well-being initiatives, and surveillance on-site can have substantial economic benefits, such that the costs of offering these services can be offset.21 Integration of WSH services thus represents a potentially effective strategy for reducing medical costs.
and absenteeism. Building up the capacity of employers to properly evaluate the economic benefits of WSH services may be an important stepping stone to facilitate the wider adoption of comprehensive and integrated WSH services in Singapore.

Health Status of the Workers

Although the BHS survey results were self-reported (increasing the likelihood of underreporting) compared with the NHS 2010 which involved objective measurements, it is still useful to compare this study population with the Singapore national population. The prevalence of chronic diseases among the survey respondents was much lower than the national prevalence obtained from the NHS 2010. This applies to all industries and could be attributed to the different ethnic and age distributions (a larger proportion of older people are present in the NHS 2010).

Nevertheless, more importantly, the survey individuals might not be aware of their existing chronic diseases or that they were undiagnosed. The NHS 2010 found that 51.4% of Singapore residents with diabetes mellitus had not been previously diagnosed. In this study, the highest prevalence of diabetes mellitus was observed in the service industry (3.9%), which comprised the highest proportion of workers aged 50 years and older compared with other industries. This figure is a great disparity from the national prevalence of 11.3%, which is the same situation for hypertension. We suspect that the true prevalence of diabetes mellitus (and possibly other chronic diseases) may be higher than what was found in this baseline health survey due to unawareness and undiagnosed state. This figure is likely to increase further in view of the aging workforce, coupled with the high prevalence of overweight and obese employees.

The knowledge of the prevalence of common chronic diseases at the workplaces is important not only because they are getting more prevalent, but the age of onset of these diseases is much earlier as well. This trend has been reported for diabetes mellitus in South America, India, China, and many other countries. Similar trend has also been reported for other chronic diseases. The WHO global report on preventing chronic diseases—a vital investment states that “Increases in the causes of chronic diseases, including unhealthy diet, physical inactivity and tobacco use are leading to people developing chronic diseases at younger ages in the increasingly urban environments of low and middle income countries.”

The notion that the management of chronic disease is not the problem of companies, but the problem of society or the government because employees will only be developing these diseases when they retire in their late 50s and 60s is already outdated. The age of onset of chronic diseases is expected to shift earlier to 40s and 50s. This means that increasingly employers will also have to deal with this critical issue at hand. Chronic diseases, if not well managed, can affect productivity, namely, sickness absenteeism, health care cost, and the working capacity of the employees. In certain countries and industries where there are labor crunch, managing chronic diseases among employees has become all the more important and necessary. As the workplace is a “captured audience” environment, it would be more effective to implement programs to detect and manage chronic diseases in the workforce, as well as to prevent or delay the onset of associated complications as much as possible. This approach is likely to be a win-win situation for both the employer and the worker. The worker with chronic disease will benefit from having better control of the disease, resulting in fewer complications and a better quality of life. For the employer, this will translate to higher productivity and a lower health care cost for the company.

Perception and Knowledge on Safety, Health, and Well-Being

The WSH360 interviews (which have been described earlier in the Methods section) provide the opportunity for companies to gain a better understanding of how SHW implementation and practices are perceived and experienced by employees from different levels and functional groups. To achieve a more reliable and representative result, we would recommend more interviews to be conducted for each stakeholder category. The radar plot (Fig. 1) provides a visual representation of the strength and deficiencies in the areas of SHW for a workplace, which could then direct attention and resources to the areas of needs or priorities. Sometimes, companies may not be aware of their deficiencies in the areas of SHW because these activities are often carried out in “silos” without any form of collaboration or integration. There is a tendency for safety (safety officers and line supervisors), health (occupational health nurses and physicians), and well-being (HR and health promoters) personnel to work independently without considering the needs of their workforce. Use of the WSH360 interview questionnaire provides the first step for these gaps to be addressed and offers a common platform for the various stakeholders of a company responsible for SHW to implement more coordinated and integrated programs.

Strengths and Limitations

This is the first study in Singapore to examine the concept of comprehensive and integrated SHW approach at the workplace. The study design team consisted of multidisciplinary team members who contributed to different aspects of the study. Data analysis was carried out separately with blinding from the identity of the companies. The sample of companies was chosen to reflect a diversity of industries and employee types.

There are some limitations. Companies were recruited for this study by “convenience sampling,” rather than random sampling. The distribution of the companies was unequal, with pest control industry being overrepresented in the study population. Therefore, the results could not be generalized to all the workplaces in Singapore. The BHS questionnaire was self-administered, and thus we cannot rule out the possibility of recall errors or misreporting in the evaluation of lifestyle risk factors such as smoking, alcohol consumption, and exercise level in the study population. In addition, our estimates of these lifestyle risk factors were taken from a single point in time, and we are thus not able to track changes in these factors from the life-course perspective.

CONCLUSIONS

This study has indicated that companies in Singapore focus mainly on workplace safety and occupational health to fulfill legislative requirements. Although the study findings suggest that the employees of companies that do implement SHW actually realize benefits as reflected in better job perceptions, most employers do not seem to recognize the importance and usefulness of comprehensive and integrated SHW for both the organization and the worker in areas such as greater job satisfaction, pride in the company, health benefits, and potential productivity gains. There is a need to enhance awareness and education about the benefits of comprehensive and integrated SHW to increase its acceptance in Singapore companies.

REFERENCES


