Occupational Health and Safety among Small and Medium Enterprise Workers in Four ASEAN Countries: Protocol of a Comparison Study

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INTRODUCTION

With the establishment of the ASEAN Economic Communities (AEC), serious epidemiology among ASEAN countries is changing and currently faces the double-burden of disease as in other developed countries. Occupational health and safety (OHS) of workers are also affected by the changing environments of industries. Worker’s health, safety and wellbeing are vital concerns to the working population. These issues are important to productivity, competitiveness and sustainability of enterprises, communities and to national, regional and international economies. An estimated 2.3 million deaths have occurred annually across countries for reasons attributed to work. Work-related diseases are among the largest mortality

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ABSTRACT

Background: Worker’s health, safety and wellbeing are vital concerns to the working population. Small and medium enterprises’ (SMEs) working environments may not be conducive to the workers, affecting workers’ physical and mental health, their overall quality of life (QoL) and productivity. Detecting and identifying risk and protective factors early on is crucial in the planning of intervention programs for SME workers. This paper describes the protocol of a study examining the QoL and occupational health and safety (OHS) of SME workers in ASEAN Economic Communities (AEC) including Thailand, Malaysia, Vietnam and Indonesia. Methods/design: This protocol describes a cross-sectional quantitative study on more than 2000 SME workers in 4 ASEAN countries, i.e., Indonesia, Malaysia, Thailand and Vietnam. SME workers aged 18 years and above were asked to complete a structured questionnaire, assessing workplace exposure, QoL, work ability, depression, anxiety and stress. Data collected were analyzed using SPSS and AMOS to measure the distribution of frequencies, associations between variables and identify predictors of work ability, depression, anxiety and stress and QoL. Conclusion: The findings of this study would able to assist policy makers and health authorities when developing promoting OHS programs among SME workers in AEC.
burden, accounting for 2 million deaths while the remainder were due to occupational injuries. Every 15 seconds, a worker dies from a work-related accident or disease. Every 15 seconds, 151 workers have a work-related accident. The economic burden of poor OHS is approximately 4% of the GDP yearly.

According to WHO in 2009, occupational exposure to airborne particulates contributes to approximately 12% of deaths due to COPD. Further, 37% of back pain cases were attributable to occupational risk factors. Lower back pain does not result in mortality; however, it does result in significant morbidity, a major cause of work absence, and subsequently leads to economic loss. Occupational noise exposure causes 16% of adult-onset hearing loss which is preventable. Such medical conditions are universal in ASEAN countries such as Indonesia, Malaysia, Thailand, Vietnam and elsewhere.

Occupational health and safety deals with aspects of health and safety in the workplace, and places a strong focus on preventing hazards. Workers’ health has several determinants including risk factors in the workplace, e.g., working hours, salary, workplace policies, health promotion and protection provisions of employment and working conditions etc., leading to accidents. Further, the annual incidence of occupational disease in India was estimated between 924,700 and 1,902,300 and deaths to be 121,000.

Small and medium enterprises’ (SMEs) working environments may not be conducive to the workers, affecting workers’ physical and mental health, their overall quality of life (QoL) and productivity. Therefore, maintaining healthy working environments for workers is deemed important if the maximum capability of workers is to be achieved. Research has shown that large enterprises seem to be most actively working for a safe working environment when compared with SMEs.

SMEs are one of the largest constituents of the workforce in ASEAN nations. However, OHS conditions of the workers are often poorer than in larger enterprises. Detecting and identifying risk and protective factors is crucial in the planning of intervention programs for SME workers. Various OHS risks and environmental hazards threaten the health and well-being of these SME workers. Thus, promoting the OHS of these workers will help achieve their full potential, maximize productivity and lower healthcare costs for their employers. Investing in this population will benefit employing institutions and nations in terms of national productivity of all AEC. AEC is one of the largest trading blocs in Asia. One of the effects of the 2015 AEC integration was the human capital movement inter- and intra-country in Asia. Although the AEC comprises 10 ASEAN countries, this study focused on 4 ASEAN countries, namely, Indonesia, Malaysia, Thailand and Vietnam for reasons given below. Indonesia is the largest Southeast Asian economy in terms of a GDP of USD868.3 billion in 2014. Malaysia has a high standard of OHS management systems. Thailand is centrally located and the regional transportation hub for both business and personal travel and finally Vietnam is in the process of industrial development. A comparison of such OHS systems would help develop a unique AEC standard of occupational health and safety management system.

Study Objectives

This paper aims to describe the study protocol of a cross-sectional comparison on the OHS of SME workers in 4 ASEAN countries. This study hopes to determine the prevalence rates of common self-reported health conditions and the psychosocial status of SME workers; to determine their work ability and QoL; to identify factors associated with the various health conditions, psychosocial status, occupational workability and the QoL of these SME factory workers and to suggest recommendations, strategies and interventions based on the findings from the study for OHS promotion and policy development.

MATERIALS AND METHODS

Study design

This project employed a cross-sectional study design. A random sampling frame was used to randomly select the various SME workers in the selected SMEs in the various cities in Bangkok, Can Tho, Jakarta and the Kuala Lumpur. These four cities were chosen because they are in four countries representative of the Southeast Asian SME population.

Sample size calculation

Based on a sample size formula and with a 20% prevalence rate of depression among SME workers, an estimated sample size of about 500 SME workers (250 from food industry and another 250 from textile industry)
In each country was selected. Therefore, in total 2000 SME workers were randomly selected in the study. SME was designed as an enterprise with less than 250 employees. Food and textile industries were chosen for the study because they are common SME industries in all four countries.

**Recruitment and eligibility screening**

The target SME for this study comprised food and textile industries, including food catering and distribution in each of the 4 ASEAN countries.

Participants who met the following inclusion criteria were eligible for recruitment in the study: Respondents who were local SME workers, aged above 18 years old and those who have worked for more than or equals to 6 months. Individuals that agreed to participate provided written informed consent. Self-administered questionnaires and interviews, were guided by the results of the questionnaires, were conducted entirely on a voluntary basis.

**Data collection**

Data collection started with the training of the enumerators before the actual fieldwork. Each participant completed a self-devised sociodemographic questionnaire including lifestyle and OHS related questions as well various validated standardized questionnaires. These questionnaires were translated to the local language of each country and were validated before actual fieldwork. All returned questionnaires were checked onsite to ensure completeness.

**Instruments**

The self-devised questionnaire consists of 3 main sections described below.

First section: demographic data and lifestyle. This section provided a basic profile (nationality, sex, age, level of education, marital status, ethnicity, type of product handled in the factory, employment status and income) of the participants. Participants were also asked lifestyle questions (smoking status, alcohol consumption, sleeping hours, exercise habits, stress coping).

Second section: health status. The Standardized Nordic Questionnaire (SNQ) was incorporated in the questionnaire to analyze musculoskeletal symptoms in an ergonomic or OHS context. They concentrated on symptoms most often encountered in an occupational setting. The reliability of the questionnaire was acceptable. Specific characteristics of work strain were reflected in the frequency of responses to the questionnaire items. The SNQ responses were found to have high reliability and validity (Kappa values: 0.83–1.0)11. Moreover, this section provided information about the participants’ health seeking behaviors when injured at work and amount of money spent on treatment of work-related musculoskeletal disorders.

Third section: workplace assessment. This section provided information about the working environment and ergonomic conditions the participants were exposed to. Work environment and ergonomic conditions were assessed by perception of workers. Questionnaire items on work environment included physical factors such as noise, light (2 items), uncomfortable thermal conditions and hand-arm and whole body vibration. Those concerning ergonomic conditions included repetitive work, poor work posture, sitting (3 items) and standing for a long time and unsafe conditions (2 items). Possible response alternatives for each item used a 3-point scale (1 = never, 2 = sometime, 3 = frequently). Reliability of the work environment and ergonomic conditions questionnaires were .70 and .60, respectively. The score of each item was used to analyze the data.

Various validated standard questionnaires used in this study included Brief WHO Quality of Life Questionnaire (WHOQOL-BREF), Work Ability Index (WAI) and the Depression Anxiety Stress Scale (DASS-21).

The validated version of the WHO Quality of Life Brief Version (WHOQOL-BREF) used in this study was a self-administered questionnaire with a 26-item version of the 100-item instrument of the WHOQOL-100. The short form QoL assessment concerned the meaning to the respondents of different aspects of life and how satisfactory or problematic their experiences were regarding these factors. The four main domains covered in this questionnaire included physical health (7 items), psychological status (6 items), social relationships (3 items) and environmental conditions (8 items). The WHOQOL-BREF has been found to have good to excellent psychometric properties of reliability and performed well in preliminary testing of validity12,13. Translated and validated versions of the WHOQOL-BREF in Bahasa Indonesia14, Bahasa Melayu15, Thai16 and Vietnamese17 were used in this study in the respective countries.

The WAI is a self-administered questionnaire and is one of the most
commonly used tools in research to assess individual work ability during health examinations and workplace surveys. ‘Work Ability’ is defined as ‘how good is the worker at present, in the near future, and how able is he/she to do his/her work with respect to the work demands, health and mental resources’\(^{18}\). The WAI measures 7 dimensions: current work ability in relation to best ever, current work ability in relation to demands, number of physician diagnosed diseases, work impairment due to diseases, sickness absence, estimated work ability in 2 years and mental resources. The summations of the scores of the 7 dimensions provided a measure of work ability that ranged from 7 to 49 points. Higher scores indicated better work ability. Based on the WAI score, employees could be classified in four categories: poor, moderate, good and excellent work ability. The relevant points were 7-27, 28-36, 37-43 and 44-49, respectively\(^{19}\). The validity and reliability of the WAI has been assessed by correlation analyses. The WAI and all its items reliably predicted work disability, retirement and mortality. Further, other studies have shown that the WAI is valid and reliable\(^{20-22}\). Translated and validated versions of the work ability index in Bahasa Indonesia, Bahasa Melayu, Thai\(^{23}\) and Vietnamese were in this study.

A validated version of the DASS-21 questionnaire was used to measure the negative self-perceived emotional states of stress, anxiety and depression. Each component of the DASS scales consisted of 7 items. The stress scale of the DASS was sensitive to levels of chronic and nonspecific arousal. It assesses difficulty in relaxing, nervous arousal, and being easily upset or agitated, irritable or overactive and impatient. The anxiety scale of the DASS assesses autonomic arousal, skeletal muscle effects, situational anxiety and subjective experience of anxious effect. The depression scale of the DASS assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia and inertia. A 4-point rating scale (0 = Did not apply to me at all, 1 = Applied to me to some degree, or some of the time, 2 = Applied to me to a considerable degree, or a good part of time, 3 = Applied to me very much, or most of the time) was used to rate the extent in which participants have experienced each state over the past one week. Various findings have shown that DASS21 is a valid and reliable instrument to measure dimensions of depression, anxiety and stress. Bahasa Melayu\(^{24-26}\), Bahasa Indonesia\(^{27}\), Thai\(^{28}\), Vietnamese\(^{29}\) versions which have been translated and validated from the English version were used in this study.

**Ethics considerations**

Ethics approval was obtained from the various institutional review boards in the respective countries.

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<td>Vietnam</td>
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**Statistical analysis**

Data collected was analyzed using SPSS and AMOS to measure the distribution of frequencies and were presented as proportions, mean ± standard deviations, or medians and interquartile ranges. Bivariate analyses examined the associations between sociodemographic data, health conditions, psychosocial variables and outcome variables. A structure equation model was used to identify predictive and risk factors associated with the health conditions, psychosocial status, occupational work ability and the quality of life of the SME workers. The model was adjusted for established and potential confounders and significance level was set at 0.05.
DISCUSSION

This paper presents the design and protocol of a cross sectional study of an ASEAN survey on the QoL, physical and mental health and OHS among workers in SMEs among 4 ASEAN countries - Indonesia, Malaysia, Thailand and Vietnam. Not many studies are available on the prevalence rates of common self-reported health conditions, psychosocial status, work ability, QoL and its associated factors regarding SME workers across ASEAN countries. This study was initiated with the establishment of the AEC, where various ASEAN countries forge links not just political and economic but also in promoting scientific research collaboration, academic exchange in terms of knowledge and capacity building and encouraging better scholarships.

Health research among ASEAN countries has increased since the establishment of the AEC. Regional or international research collaboration in healthcare has intensified and is regarded as an indicator of quality and a way to develop and disseminate scientific knowledge to newly developing ASEAN countries. Collaborative research is a complex process. Creating this research proposal entailed challenges related to intercultural issues among the participating countries, logistics, research funding, method issues such as a comparable instruments that could be used across the participating ASEAN countries, varying definitions of SMEs, a weak research capacity and research ethics challenges in some countries. Issues regarding research capacity building, research responsibility and commitment, use of data, joint publications and an enabling research environment leading to research sustainability were utmost important. We needed to examine the processes, practicability and dynamics within ASEAN collaboration health research. A further need for research partnership was observed in terms of project design, implementation and dissemination of research findings. The success of research collaboration among ASEAN countries very much depends on a responsive research capacity building plan, credibility, adequate financing, efficient communication as well as the political will.

Nevertheless, this study was considered strong theoretical due to the multiple factors (health conditions, psychosocial backgrounds, workability, QoL) associated with SME workers and empirical due to the large sample size (with similar sociodemographic backgrounds). However, this study was not without its limitations. Firstly, a cross sectional method was used in this study. Thus, we are unable to draw conclusions about causality or rule out reverse causality. Secondly, self-reported perceptual data was used in this study. Variables under study like health conditions, psychosocial backgrounds, work ability, QoL of the workers might be prone to social desirability. Respondents might respond to certain statements in the questionnaires to present themselves in a positive light. Hence, the emphasis on confidentiality when conducting this study was much needed to reduce this. Our study was limited to employees working in food and textile industries in the 4 ASEAN countries. Further research is needed to know if generalizations are possible from just these two industries. Different industries may have different work cultures and work exposures. Nevertheless, we believe that our large sample of SME employees spanning over 4 countries would make such generalizations possible.

CONCLUSION

This 4-ASEAN country comparison study will provide much needed information about the OHS conditions, physical and mental health conditions, psychosocial backgrounds, work ability, QoL and associated factors of SME workers to serve as a foundation towards formulating policies and programs to promote better OHS in this subpopulation as well as set up an AEC OHS management system in the ASEAN region.

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REFERENCES

3. World Health Organization. Global


