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Research Article
Predictive Factors for Quality of Life Among Small and Medium Enterprise Workers in Indonesia

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Abstract

Background and Objective: There are more than 7 million workers in the small and medium enterprises (SME) in Indonesia. The various occupational risks and environmental hazards threaten the health and well-being of these SME workers. It is important to promote occupational health and safety programs in order to improve quality of life (QOL). This study aimed to explore the socio-demographic profile and to examine the factors that impact the QOL among SME workers in Indonesia. **Methodology:** This study utilized a cross sectional study design. WHO quality of life (WHO-QOL) questionnaire was used to determine individuals perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. Four domain scores include physical, psychological, environmental and social relationship. Sample for this study were 492 workers from 2 SME industries (food and textile). All of the industries were in registered in the Indonesia Ministry of Trade and Industry. Bivariate analysis was used by ordered logistic regression for quality of life in general with satisfaction of health as dependent variable and logistic regression for 4 domains as dependent variable. **Results:** The poor condition was found in social domain (36.58%, $\mu = 0.63$, SD = 0.48), followed by psychological (32.32%, $\mu = 0.68$, SD = 0.46), environmental (25.2%, $\mu = 0.75$, SD = 0.43) and physical domain (17.47%, $\mu = 0.83$, SD = 0.38). Quality of life among non-permanent employer was 0.5 times lower than permanent employees. Employees with higher educational level had better QOL (OR = 1.149 , CI = 1.063-1.242) in all domains. Employee with long duration of sleep had better QOL than those with short sleep duration. The SME workers who exercised regularly had 2 times better QOL (physical and social domain) and were more satisfied with their health than workers who did not exercise regularly. **Conclusion:** Socio-demographic factors influenced the quality of life among Indonesian workers, as well as job characteristics (work status, work shift and work area condition), individual characteristics (education level) and lifestyles (sleep duration and exercise habit).

Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

Early detection and identification of health and safety risk is crucial in the planning of intervention programs for SME workers. Based on Bureau Statistic Center of Indonesia[1] there are more than 7 million workers in the micro and small industries in Indonesia and more than 90% of them are in Java, Bali and Nusa Tenggara Island as shown in Table 1.

The various occupational risks and environmental hazards threaten the health and well-being of these SME workers. Kittipichai *et al.*[2] studied the quality of life of textile workers in Thailand and showed that safety at work is related to quality of life. Breslin *et al.*[3] by systematical review showed Occupational Health and Safety (OHS) intervention, such as engineering arrangement, staff training, social marketing and safety audit had positive effects on OHS outcomes. Lu *et al.*[4] also found some variables related to the worker's health, such as occupational health services, use of protective equipment and occupational health training. These variables were included in the model to predict the Health Related Quality of Life (HRQOL) among rural to urban migrants among SMEs in China.

Thus, promoting occupational health and safety of these SME workers will contribute to the development of their full potential, maximize productivity and lower healthcare costs for their employers. Investing in this population will in return benefit not only the employer, but also the entire nation in terms of national productivity as well as the entire Association of Southeast Asian Nations (ASEAN) Economic Community (AEC)[5,6].

One of the effects of the 2015 AEC integration is the human capital movement inter and intra-country in Southeast Asia[7]. The AEC comprises of 10 Asian countries, including Indonesia and hence, it is important to enhance the potential and the ability of workers to increase their competitiveness. This can be achieved if the SME workers in Indonesia have good quality of life and good working conditions. The study on quality of life would guide the policy maker to take into account the promotion of quality of life among SME workers. The improvement in the quality of life of SME workers could result in an improved organization and a happier workplace.

Skrzypczak *et al.*[8] stated that the level of education and marital status was shown to affect the quality of life, implying differences in the area of social contacts. Teles *et al.*[9] found that there is an association between adverse psychosocial work conditions and poor quality of life among primary health care workers. Ouppara and Sy[10] studied on quality work practice in Australia concluded that quality of life is important to create a more human work environment in firms.

Table 1: Number of SME workers in Indonesia in 2015

Province	Workers
Sumatera	89,549
Java, Bali and Nusa Tenggara	6,989,305
Kalimantan	272,467
Sulawesi, Maluku and Gorontalo	562,087
Papua and West Papua	22,373
Total	7,935,781

Source: www.bps.go.id

Other studies on the occupational health and safety of SME workers are abounding in individual Asian countries[11,12] or cross Asian countries[13]. Isahak *et al.*[13] presented cross-national comparison survey of the occupational health and safety of SME workers in the ASEAN countries, namely Malaysia, Indonesia, Vietnam and Thailand. A comprehensive data on the prevalence of the physical health, mental health and work ability of SME workers is needed in order for government and NGO's to plan program to promote occupational health and safety of this sub-population. However, there were limited data about QOL (physical, mental, social and environmental) among SME workers in Indonesia. Therefore, it is important to understand factors that impact QOL; the result could provide valuable input to help develop OHS programs.

This study aimed to examine the socio-demographic profile (i.e. sex, marital status, employment status and tenure of work) and factors that impact the quality of life based on 4 domains namely; physical, psychological, social and environment. The SME workers were chosen for this study because a high percentage of workers in most Southeast Asian countries are SME workers.

MATERIALS AND METHODS

Research design: An analytical cross sectional design was used in this study of SME workers in the food and garment industries. This study is part of a multicenter study in four ASEAN countries (Thailand, Indonesia, Malaysia and Vietnam) with the host investigator based in Mahidol University, Bangkok, Thailand. This study specifically deals with data collected in Jakarta and Depok City in Indonesia. The study had ethical approval from the Ethics Committee at the Universitas Indonesia: Ethical Approval Ref. 172/H2.F10/PPM. 00.02/2015.

Sampling technique: Samples were workers who worked in small and medium enterprises. After receiving Ethics Approval, each SME was randomly selected to be part of this study if it meets the requirement and is registered with the Ministry of

Trade and Industry. Then, permission was sought from the SME owners to conduct the research. The requirement of small industry is number of workers not more than 50 persons; for the medium industry, the number of workers is up to 250 persons. To be part of the study each participant must be above 18 years old and had worked at least 6 months at that SME.

There were 17 food industry SMEs and 13 garment industry SMEs selected by random which met the requirements from 3 SME's area center, each around 40 industries in Jakarta (North, Earth and West) and Depok City. The participants were interviewed for socio-demographic questionnaires but the QOL questionnaire was self-administered. The socio-demographic questionnaire collected by interviewed because there are several open questions and need further explanation unlike QOL questionnaire which were all in Likert scale. The interviews were conducted during the recess time or the end of shifts and it took about 10 min for each participant. Data collection took 3 weeks. Informed consent was obtained from all participants.

Based on a sample size formula and prevalence rate of depression (20%) among workers, it is estimated that the sample size should be approximately 500 workers; 250 from food industry and 250 from garment industry. Five hundred and fifty questionnaires were distributed, including 10% added in anticipation of non-response. The response rate was 90.9%, but after data clean-up, there were 492 completed questionnaires for analysis.

Research instrument: The socio-demographic questionnaire was used to identify:

- **Individual characteristics:** Sex, age, religion, ethnicity, level of education, marital status
- **Job characteristics:** Work status, work hour per day, work shift, overtime, monthly income
- **Lifestyle:** Exercise, smoking habits, sleep duration and alcohol consumption
- **Accommodation:** House of worker, transportation to work
- **Work area condition:** Identified noise, vibration, lighting, temperature, humidity, ergonomic factors and manual handling were measured as follows: Frequently, occasionally and non-existence. It was then categorized as poor and good condition. (Good condition present if the score of work area condition was above 1st Quartile)

WHO[14] defined quality of life as individual's perceptions of their position in life in the context of culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. This definition reflects the view that quality of life refers to a subjective evaluation which is embedded in a culture, social and environmental context.

The World Health Organization quality of Life-BREF (WHOQOL-BREF) contains a total of 26 questions, where 24 questions were classified into four domains: Physical health, psychological health, social relationships and environmental resources; 2 questions examine self-perception about the overall quality of life and general health facet. Each domain contains questions with response options on a Likert-scale (1 = Not at all, 2 = Not much, 3 = Moderately, 4 = Great deal, 5 = Completely). The QOL was categorized from median score by Skevington *et al.*[15] and lowest quartile score by Teles *et al.*[9]. Thus, QOL in this study was categorized into 2; good and poor QOL based on Quartile score. Poor QOL calculated by the lowest score from the samples (below the 1st quartile). In this study scores of 1st quartile in physical domain was 13.14; psychological domain was 12.67; social domain was 12 and environmental domain was 11.5.

Statistical analysis: The SPSS version 17.0 was used for data analysis[16]. The statistics used included descriptive statistics (i.e., frequency, percentage, mean, median and standard deviation) and bivariate analysis used ordered logistic regression for quality of life in general with satisfaction of health as dependent variable and logistic regression for 4 domains as dependent variable. The statistical significance was set at the level of less than 0.05.

RESULTS

Univariate: The description of individual characteristics, job characteristics, lifestyle and work area conditions is shown in Table 2. The proportion of male workers was higher than female workers. Most of them were married, have at least junior high school education, permanent staff with the rest being part-time/temporary/non-permanent. The average work hour was 10 h day^{-1} they work overtime almost every day. Thus, the range of monthly income is quite different.

Regarding the lifestyle of respondents, slightly over half of respondents (52.85%) were current smoker and did not perform exercise regularly (65.24%). The average sleep duration was 6.58 h day^{-1} (Range: 3-10 h day^{-1}). The majority of the respondents were Muslims and only 2.58% had consumed alcohol.

The environmental conditions of workplace based on noise, vibration, lighting, temperature, humidity, ergonomic factors and manual handling were shown to be in good conditions (73.78%).

Table 2: Univariate analysis of demographic data of participants (n = 492)

Parameters	n (%)	Mean	Minimum	Maximum	Standard deviation
Individual characteristics					
Gender					
Female	153 (31.1)				
Male	339 (68.90)				
Age (years)		33.01	18	60	9.62
19-50	476 (97.1)				
>50	16 (2.8)				
Religion					
Islam	480 (97.56)				
Others	12 (2.44)				
Length of education		8.46	0	16	2.73
Level of education					
None	8 (1.63)				
Primary school	168 (34.15)				
Junior high school	203 (41.26)				
Senior high school	82 (16.67)				
Vocational school	21 (4.27)				
University	10 (2.03)				
Marital status					
Single	136 (27.64)				
Married	345 (70.12)				
Divorce/widow	11 (2.24)				
Job characteristics					
Work status					
Permanent	307 (62.4)				
Non-permanent	185 (37.6)				
Work hour per days		10	4	17	2.4
Work shift					
Yes	20 (4.07)				
No	472 (95.93)				
Overtime (hours per week)		2.19	0	36	5.4
Monthly income (USD)		147.71	23.07	769.23	83.05
Lifestyle					
Exercise					
Yes	171 (34.76)				
No	321 (65.24)				
Smoking habit					
No	232 (47.15)				
Yes	260 (52.85)				
Sleep duration (hour per day)		6.58	3	10	1.35
Alcohol consumption					
Yes	13 (2.58)				
No	479 (97.15)				
Work area condition					
Good	363 (73.78)				
Poor	129 (26.22)				

General quality of life descriptive is shown in Fig. 1. Most of respondents had good QOL for physical, psychological, social and environmental domain. The poor condition were found mainly in social domain (36.58%, $\mu = 0.63$, SD = 0.48), followed by psychological (32.32%, $\mu = 0.68$, SD = 0.46), environmental (25.2%, $\mu = 0.75$, SD = 0.43) and physical domain (17.47%, $\mu = 0.83$, SD = 0.38).

The WHOQOL-BREF also contains 2 questions related to satisfaction of health and overall quality of life and were scored as very poor/very dissatisfied, poor/dissatisfied, neither poor nor good, good/satisfied and very good/very satisfied, as shown on Fig. 2. Approximately 50% had neither poor nor good QOL or satisfaction of health. Very good and very satisfied conditions accounted for 4.47 and 5.08%, where very poor and very dissatisfied conditions accounted for only 0.61 and 0.2%.

Bivariate analysis: Bivariate analysis between QOL and socio-demographic is shown in Table 3. It presented all domains with correlations with socio-demographic parameters.
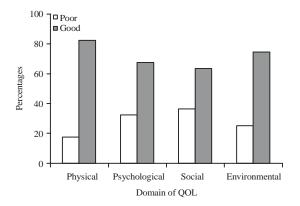
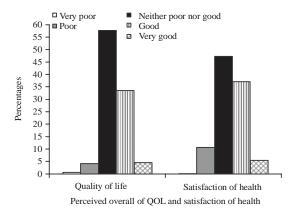Fig. 1: General description of the four domains of QOL

Fig. 2: Assessment of overall perceived QOL and satisfaction of health

Physical domain had the most correlations with 8 socio-demographic parameters (age, marital status, work status, work shift, exercise, smoking habit, sleep duration and work area condition). Psychological domain had correlations with 7 socio-demographic parameters; age, level of education, work status, work shift, exercise, smoking habit and work area condition. The social domain had correlations with level of education and exercise. Environmental domain had correlations with marital status, work shift and exercise.

Exercise and smoking habit were correlated and the self-perception for the overall quality of life and satisfaction of health had correlations with both variables. Additionally, level of education, sleep duration and work area conditions were related to perceive of health satisfaction.

Logistic regression/multivariate analysis: Based on the correlations between QOL and the demographic data (Table 3), the significant variables were entered into logistic regression models. Results of logistic regression are presented in Table 4.

Based on bivariate (Table 3) and multivariate (Table 4) analysis, several socio-demographic parameters were correlated with QOL. Job factor, such as work status, work shift and work area condition had significant correlations with physical and psychological domain. Environment domain was not significant in both bivariate and multivariate analysis while exercise was significant for all domains in the bivariate analysis. Exercise was significant in physical domain, social domain and self-perception in the overall QOL and health satisfaction for multivariate analysis. Besides that, individual factors, such as level education and duration of sleep were significantly correlated with psychological domain and physical domain.

DISCUSSION

Job characteristics played a role in QOL. In physical domain, important characteristics include work status, exercise, work shift, sleep duration and work area condition. For psychological domain, important factors include education, work status, work shift and work area condition.

The QOL of non-permanent employees was lower by 0.5 times than permanent employees. Permanent employees get more salary and allowance. Moreover, permanent status also provides employees with increased sense of security for their jobs. Teles *et al.*[9] also found that employees with imbalanced effort-reward (high effort/low reward) had an increased probability of general poor quality of life, particularly in physical and environmental domain. The employees with low effort/low reward demonstrated a greater probability of poor quality of life in the social domain. Chinomona and Dhurup[17] found QOL to be positively influenced by employee job satisfaction, job commitment and consequently tenure intention. When organization views employees as important asset, then organization will treat employees well, especially employees who have good skills and performances.

Ouppara and Sy[10] stated that quality of work life represents a desired end; they emphasize the importance of providing opportunities for employees to contribute to their jobs as well as to receive more from their jobs. It considers people as an "Asset" to the organization and that people perform better when they are allowed to participate in managing their work and make decisions. Having certain roles and responsibilities, permanent employees feel more valued by the organization, a condition that stimulates good performance and increased productivity.

Indonesian government has maintained the employee status in regulation by Ministry of Manpower number 13 year 2003[18]; it is about employment. In article number 59, it described outsourcing employees or non-permanent employees a having only 2 years contract with 1 year for one

Table 3: Bivariate analysis of QOL with demographic data

QOL	Demographics	OR	95% CI	p-value
Physical	Gender	1.385	0.817-2.347	0.225**
Domain	Age	0.973	0.950-0.997	0.030*
	Level of education	1.083	0.994-1.180	0.067**
	Marital status			
	• Married	0.459	0.248-0.847	0.013*
	• Widow/divorce	0.306	0.072-1.288	0.106**
	Work status	2.865	1.626-5.047	0.001*
	Work shift	4.197	1.682-10.470	0.002*
	Monthly income	0.999	0.996-1.002	0.787
	Exercise	2.701	1.514-4.819	0.001*
	Smoking habit	2.091	1.280-3.418	0.003*
	Sleep duration	1.202	1.009-1.432	0.039*
	Alcohol consumption	1.297	0.354-4.754	0.694
	Work area condition	3.5	2.155-5.683	0.001*
Psychological domain	Gender	1.112	0.737-1.678	0.611
	Age	0.979	0.960-0.999	0.042*
	Level of education	1.128	1.049-1.211	0.001*
	Marital status			
	• Married	0.745	0.482-1.153	0.187**
	• Widow/divorce	1.034	0.260-4.104	0.962
	Work status	2.294	1.509-3.48	0.000*
	Work shift	3.316	1.327- 8.28	0.010*
	Monthly income	1.000	0.998-1.003	0.421
	Exercise	1.843	1.213-2.799	0.004*
	Smoking habit	1.762	1.198-2.593	0.004*
	Sleep duration	1.142	0.992-1.316	0.063**
	Alcohol consumption	1.593	0.543-4.671	0.396
	Work area condition	3.652	2.397-5.564	0.000*
Social domain	Gender	0.884	0.596-1.311	0.541
	Age	0.984	0.965-1.003	0.099
	Level of education	1.131	1.054-1.213	0.001*
	Marital status			
	• Married	1.096	0.726-1.654	0.660
	• Widow/divorce	0.342	0.095-1.228	0.100**
	Work status	0.952	0.652-1.389	0.799
	Work shift	2.191	0.890-5.394	0.088**
	Monthly income	1.000	0.998-1.003	0.512
	Exercise	2.121	1.410-3.191	0.001*
	Smoking habit	0.995	0.689-1.437	0.982
	Sleep duration	1.054	0.920-1.207	0.444
	Alcohol consumption	1.310	0.447-3.838	0.622
	Work area condition	1.478	0.981-2.228	0.062**
Environmental domain	Gender	0.978	0.630-1.516	0.922
	Age	0.991	0.970-1.012	0.42
	Level of education	1.053	0.977-1.135	0.172**
	Marital status			
	• Married	0.584	0.356-0.957	0.033*
	• Widow/divorce	0.6	0.148-2.425	0.474
	Work status	1.24	0.809-1.901	0.322
	Work shift	6.039	2.351-15.510	0.001*
	Monthly income	1.001	0.998-1.004	0.270
	Exercise	1.654	1.054-2.596	0.029*
	Smoking habit	1.385	0.917-2.091	0.121
	Sleep duration	0.929	0.800-1.080	0.343
	Alcohol consumption	1.193	0.367-3.8750	0.769
	Work area condition	1.275	0.812-2.003	0.29
Overall quality of life	Gender	1.107	0.763-1.605	0.591
(Self-perception)	Age	0.988	0.970-1.007	0.230**
	Level of education	1.028	0.964-1.0962	0.397

Table 3: Continue

QOL	Demographics	OR	95% CI	p-value
	Marital status			
	• Married	0.863	0.583-1.2796	0.466
	• Widow/divorce	0.474	0.139-1.617	0.234**
	Work status	1.147	0.801-1.643	0.451
	Work shift	2.438	0.924-6.431	0.072**
	Monthly income	1	0.998-1.002	0.366
	Exercise	2.024	1.398-2.930	0.001*
	Smoking habit	1.726	1.213-2.455	0.002*
	Sleep duration	0.977	0.860-1.110	0.728
	Alcohol consumption	2.652	0.805-8.731	0.109**
	Work area condition	1.422	0.952-2.125	0.085**

OR: Odds ratio, correlation with CI (Confidence interval) = 95%, **p<0.250, include on multivariate analysis

Table 4: Multivariate analysis between QOL with social demographic

QOL	Demographics	OR	95% CI	p-value
Physical domain	Education	1.065	0.964-1.177	0.214
	Work status	0.492	0.269-0.898	0.009*
	Work shift	3.906	1.401-10.894	0.011*
	Exercise	2.234	1.204-4.146	0.031*
	Sleep duration	1.236	1.019-1.498	0.001*
	Work area condition	2.937	1.746-4.939	0.044*
Psychological domain	Education	1.149	1.063-1.242	0.001*
	Work status	0.523	0.333-0.820	0.005*
	Work shift	3.974	1.473-10.725	0.006*
	Work area condition	3.18	2.045-4.946	0.001*
Social domain	Exercise	2.121	1.410-3.191	0.001*
Overall quality of life	Age	0.987	0.969-1.006	0.194
(Self-perception)	Exercise	1.917	1.320-2.783	0.001*
	Alcohol consumption	2.675	0.771-9.279	0.121
	Work area condition	1.379	0.917-2.074	0.122
Satisfaction of health (Self-perception)	Exercise	1.816	1.271-2.595	0.001*

OR: Odds ratio, *Correlation with CI (Confidence interval) = 95%

extended contract. After this period, the organization then hires the employees as permanent status.

Shift work also affects QOL (physical and psychological domain). This study showed that employees without shift work had 4 times higher QOL than employees with shift work. Employees with shift work are easily exposed to fatigue, especially the night shift. Shift work is generally defined as a work schedule that is at least 50% done after 4:00 pm. Shift work is mainly established for industrial sector. The pattern of this study can cause drowsiness and fatigue, thereby increasing the possibility of falling asleep while working and increasing the risk of work accidents[19]. Shift work, especially the night shift patterns are the most at risk of fatigue. This is caused by a conflict between daily circadian rhythms and an unnatural biological time of sleep. Baulk *et al.*[20] stated shift work also affected sleep duration because of behavior, particularly for night shift workers. Total wakefulness at the end of shift and subjective fatigue were increased for night shifts. Rajaratnam *et al.*[21] found falling asleep at work at least once a week occurs in 32-36% of shift workers. Risk of

occupational accidents is at least 60% higher for non-day shift workers. Shift workers also have higher rates of cardiometabolic diseases and mood disturbances. There is growing evidence that understanding the inter-individual variability in sleep-wake responses to shift work will help to detect and manage workers vulnerable to the health consequences of shift work.

This study showed that QOL-physical domain was affected by sleep duration where odds of good QOL is 1.236 in every 1 h of sleep; average sleep duration among SME workers in this study was 6.58 h day^{-1} (3-10 h day^{-1}), thus meeting the recommendation of duration sleep is 6-8 h day^{-1}. However, there were also workers who had only 3 h of sleep. Shift work affected sleep duration and led to fatigue.

Ministry of Manpower of Republic Indonesia[18] also maintained work hour in regulation number 13 years 2003 about labor. Article number 77 mentioned that work hour is 7 h day^{-1} or 40 h week^{-1} for 6 days week^{-1} or 8 h day^{-1} or 49 h week^{-1} for 5 days weeks^{-1}. Article number 78 mentioned that maximum overtime is 3 h days^{-1} and 14 h week^{-1}, with agreement from employees' representative.

Regarding QOL-physical and psychological domain, the last job factor affected is work area condition. Good work area condition had contributed about 3 times higher QOL than poor work area condition. Schlader *et al.*[22] found inadequate work environment (such as heat and noise) can also cause fatigue. Cheuvront *et al.*[23] found that fatigue is caused by exposure to a hot environment which aggravate the heart condition that accompanied by the decline of oxygen capacity in the tissues, disrupt the regulation of body temperature and disrupt the balance of body fluids, while noise is reported to be associated with stress that is characterized by fatigue.

Moreover, the work area in the SME showed noisy, dust, humid and hot work environment which affect fatigue. High dust concentrations in the respiratory tract can disturb the physiological organs in the respiratory system, so that the oxygen demands on the tissues are not met, or the function of organs of the respiratory system becomes more severe. These factors become more severe with heat and humidity which causes exhaustion and fatigue. Bates and Schneider[24] demonstrated that people can work, without adverse physiological effects and dehydration, in hot conditions if they are provided with the appropriate fluids and are allowed to self-pace.

Individual characteristic, especially education level, had correlation with QOL-psychological domain (OR: 1.149; 1.063-1.243). Employees with higher education had better QOL by 1.149 times in every level. Buntinx and Schalock[25] showed higher level of education increased the quality of life, especially for physical health. Knowledge of the quality of life conceptual and measurement framework is also a prerequisite for enhancing support and evaluating personal outcomes. Knowledge of the support construct and its relationship to personal competencies and quality of life-related outcomes is also necessary for a valid and effective process chain of professional assistance. This shows that the importance of knowledge and education in improving quality of life. Furthermore, WHO[26] also recommended training and education in health promotion for occupational health personnel as part of their occupational health practice.

Lifestyle, particularly exercise habit correlated with physical domain, social domain, perceived overall QOL and perceived of health satisfaction. The multivariate results found that workers who exercised regularly had 2 times better QOL (physical and social domain) than these who did not exercise. Employees perceived that performing routine exercise will improve QOL and health satisfaction. Some 65.24% of SME workers did not perform exercise regularly.

Exercise with its physical and psychological health benefits has been well known. The benefits are not only for healthy people, but particularly important for unhealthy people. Lerdal *et al.*[27] noted that participation in group-based prescribed exercise program for 3 months may improve physical fitness and Health Related-QOL (HRQOL) significantly in short and long term. There were clinically significant long term improvements in the Health Related-QOL (HRQOL) associated with physical functioning, mental health, performance of daily activity and overall health at the 12-month follow-up. Similarly, Hill[28] have consistently demonstrated that patients with stable COPD, supervised ground-based walking improved health-related quality of life and exercise endurance and is therefore an appropriate intervention in locations where specialized exercise equipment is unavailable.

Reid *et al.*[29] presented aerobic physical activity with sleep hygiene education as an effective treatment approach to improve sleep quality, mood and quality of life in older adults with chronic insomnia. Thus, exercise is the important lifestyle that should be performed to improve QOL.

Overall, this study indicated the need to promote and improve health promotion program for workers, such as managing workplace conditions, setting up work shift in order to promote sufficient sleep hour, forming regular workplace exercise program and supporting trainings for the workers. The quality of life may indicate the quality of production and for this reason, investing in the quality of life can bring benefits to not only to workers, but the small and medium enterprises.

CONCLUSION

The study showed that workers had a good condition for physical, psychological, social and environmental domains. Job characteristics, particularly work status, work shift and work area condition had significant correlations with physical and psychological domain. Individual characteristics, especially education level, correlated with psychological domain; lifestyles, such as sleep duration, correlated with physical domain and exercise habit correlation with physical and social domains, as well as perceived overall QOL and health satisfaction.

SIGNIFICANCE STATEMENTS

Small and Medium Enterprise (SME) workers are the highest percentage of workers in most Southeast Asian countries, including Indonesia. This study explored their QOL conditions and the influence of social demographic factors on QOL. It was found that most of respondents had good

QOL for physical, psychological, social and environmental domains. The education level among SME workers was low as most of them only graduated from junior high school. The long work hour per day causes workers to not have enough time for exercise and sleep. These conditions had impacted to their QOL. Job factor, such as work status, work shift and work area condition, also had influenced on the QOL.

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