

Preliminary Study of Musculoskeletal Complaints and Ergonomic Risk Factors among Catering Workers

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ABSTRACT

Objective: A cross-sectional study was carried out to investigate the ergonomics risk factors, identify the symptom or significant factors of Work- Related Musculoskeletal Disorders (WMSDs) and to find the relationship between exposure of ergonomic risk score and musculoskeletal complaints among sixty catering workers (n=60) in a self-owned catering company in Malaysia.

Method: Data collection was done using two standard instruments, namely Nordic Musculoskeletal Questionnaire (NMQ) and Quick Exposure Check (QEC Checklist).

Result: Based on the results, upper back (65%) and lower back (43.3%), area of knees (58.3%) and upper limbs (wrist and hand (46.7%) and shoulder (43.3%)) are the most dominant complaints among catering workers. QEC analysis shows that, shoulder, back and neck area giving high score for the postural assessment. On top of that, the relationship between gender and QEC Score was found to be absent (p-value = 0.65).

Conclusion: The risk factor of WMSDs which contributed into this problem is physical work demands such as repetitive manual work, lifting and forceful movements, awkward posture and efforts. These are well-known risk factors contributing to WMSDs.

Keywords: *musculoskeletal disorders, hospitality workers, QEC (Quick Exposure Check), ergonomic risk assessment*

1. Introduction

Work-Related Musculoskeletal Disorders (WMSDs) have been an extensively explored focus for many decades. WMSDs are the main cause of occupational injury in the developed and industrially developing countries (Nejad, et al., 2013). WMSDs denotes health problems of the locomotors apparatus, i.e. muscles, skeleton, joints tendons, cartilage, vascular system, ligaments, nerves and localized blood circulation system (Kumar et al., 2011). The prevalence of WMSDs is high, leading to a risk for sick leave and disability when the exposure is prolonged (Wahlstedt, et al., 2010).

WMSDs continue to be a major source of disability and lost work time. There has been an increasing effort in recent

years to investigate the causes of WMSDs (Ghasemkhani, et al., 2008; Sukadarin et al. 2016). Based on record, around 19 workers in every 100,000 suffered from WMSDs. In total, around 69.2% of the workers reported some sort of musculoskeletal complaint (Prins et al., 2000).

WMSDs in the catering industry also shows an increase in numbers. As can be seen in Taiwan national survey in 2005 (Guo 2005), it was estimated that over 1 million workers suffer from musculoskeletal symptoms, and food service workers were found to have a high risk for WRMD. Catering industry which comprised of food related businesses provide services to a variety of clients. Catering industries were found to posse WMSDs and ergonomic hazards (Subramaniam & Murugesan, 2015). A study related to kitchen workers had revealed that the high prevalence of WMSDs for the shoulder (41.1%), hands/wrists (38.2%)

and lower back (40.1%) among food service workers in Taiwan (Chyuan, et al., 2004). While a study by Subramaniam and Murugesan, (2015) in South of India found that discomfort regions were identified among the male kitchen workers with a higher prevalence ratio of discomfort level at the lower back region and the shoulder region.

A study conducted by Haukka et al., (2014) among 495 female workers in Finland shows that the role of physical workload, leisure-time physical activity, obesity and smoking in predicting the occurrence and course of multisite musculoskeletal pain among kitchen workers. Excess force exerted, manual handlings, whilst slips, trips and falls are the main causes of injuries. These problems not only endanger the workers well-being but it may also significantly affect the public environment (Qiang & Chow, 2007).

2. Problem Statement

Catering workers face a range of health and safety hazards from their job tasks. Catering workers are cooks and food preps who make large amounts of food for parties, galas and events. Instead of working in a restaurant and making food to order, catering workers prepare all dishes at once and serve the prepared dishes to the clients. Fast work pacing, manual handling and long hour work, are common for them. Due to that, WMSDs in catering industry cause substantial economic losses to individuals as well as to the community. Although the effect of WMSDs among catering workers is undeniable, research regarding safe work practice, manual handling that specific to hospitality industry such as catering work are still lacking. Therefore, this research is conducted so that ergonomics problems among catering workers are highlighted and further improvement could be proposed and managed.

3. The Aim of Research

This research has three objectives which are:

1. To identify the symptoms of WMSDs among catering workers.
2. To conduct postural analysis in identifying ergonomics risk factors among catering workers.
3. To investigate whether there is a different between male and female respondent in relation to postural analysis score.

4. Materials and Method

A cross sectional study was conducted among 60 respondents. All workers, both male and female of different age were included in this study. For age, minimum age is 15 years old and maximum age of workers that is counted for

this study is 64 years old. However, subjects who have existing musculoskeletal symptoms reported were also excluded. The study area is at the cooking activities and canopy setting site.

4.2. Interview

The structured interview session was conducted to obtain information regarding worker's perception towards their job conditions and job task.

4.2. Observation

A walk- through observation was performed to identify the ergonomics risk factors at the workplace environment and to identify the real problem that lead to WMSDs among catering workers.

4.3. Questionnaire

A self-administrative Nordic Musculoskeletal Questionnaire (NMQ) by Kuorinka, et al. (1987) was used as instruments to obtain WMSDs complaint. NMQ is a useful tool for monitoring WMSDs, as it include numerical rating scales of symptom severity (Descatha, 2007).

4.3. Postural Analysis

Quick Exposure Check (QEC) developed at the Robens Centre for Health Ergonomics in the United Kingdom by Li and Buckle (1998) used to assess ergonomics risk factors. This method involves both practitioner (observer) and workers (who have direct experience of performing the job) in conducting the assessment. Due to that, this method has been used by many researchers in in the field of ergonomics study (Sukadarin et al. 2013; Erdinc 2015).

5. Result and Discussion

Table 1 shows the demographic information obtained during data collection. The information includes age and gender. Majority (60%) of respondents are still young (15 – 34 years old). Only 3% of respondents age in the range of 55- 64 years old. Majority of respondents are male that consist of 61.67% of total respondents.

The result of NMQ (Table 2) shows that the prevalence of WMSDs complaint among catering workers. From the table, repondents' complaint are high on upper limbs (43.3% for shoulder, 46.7% for wrist/hand), and at the back region of the body which are 65% for upper back and 43.3% for lower back. For lower limbs such as knees also reported high complaint (58%) among respondents.

Knee pain, back pain, shoulder and hand pain are the indicator of workers are exposed to the activity that involve with lifting (Sukadarin et 2016). Handling heavy, hot pot is

the example of task that catering workers have to deal with. Catering workers also reported a few complaints associated with neck (25%) and elbow regions (5%). This may due to the activity such as setting up the canopy frames for events. This type of activity normally involved poor working posture that may give an adverse effect on neck (Ariëns et al., 2001).

Table 1. Demographic information of samples (N=60)

Variables	F	Percentage (%)	
Age	15-24	30	50.00
	25-34	6	10.00
	34-44	12	20.00
	45-44	10	16.66
	55-64	2	3.33
Gender	Male	37	61.67
	Female	23	38.33

F = Frequency

Table 2. Musculoskeletal complaints in different body sites

Body Regions	Complaints (%)
Upper Back	65
Knees	58.3
Wrists/Hands	46.7
Lower Back	43.3
Shoulders	43.3
Neck	25
Ankles/Feet	13.3
Hips/Thighs	10
Elbows	5

The summary of QEC results (Table 3) for catering work activities shows that, back region of the body and shoulder region have been recorded as “very high” score with 10% and 6.7% respectively. “High” QEC score is obtained for shoulder (25%) followed by neck (20%) and back (10%). “Moderate” score for back region (60%), shoulder (51.7%) and arm (48.3%). Meanwhile, “low” QEC score also obtained for neck (75%), arm (46.7%), back (20%) and lastly for shoulder (16.7%).

Table 3. QEC Exposure Score

Body Region	Exposure Score (%)			
	Low	Moderate	High	Very High
Back	20	60	10	10
Shoulder	16.7	51.7	25	6.7
Arm	46.7	48.3	5	0
Neck	75	5	20	0

In a study by Subramaniam and Murugesan in 2015, the risk factors for WMSDs among catering workers were found in repetitive work, awkward posture, excessive force, prolonged standing and lifting/pulling heavy objects. Haukka et al (2014) also revealed that WMSDs increased with age and prolonged service in the kitchen. WMSDs related pain also prominent among catering workers in Taiwan, however the result shows that WMSDs does not appear to interfere with job performance and daily living (Chyuan et al. 2004).

Hooftman, et al., (2004) have proved that women have a higher risk of neck, shoulder and back complaints than men. However, in this study through the Independent T-test between gender and QEC Score, the result obtained signifies that there is no association between QEC Score and gender (Table 4).

Table 4. Independent T-test between gender and QEC Score

Index	Gender	Levene’s Test		Confidence		P-Value
		for Equality of Variances	Sig	Interval 95%	UL	
QEC score	M Fe	F 5.379	0.024	1.75	-1.10	0.65

M = Male; Fe = female; F = Test statistic of Levene's test; Sig =Significant level; UL =Upper Limit; LL =Lower Limit; P= Index P- Value

6. Conclusion

Musculoskeletal complaints among catering workers were high due to the activities that involved heavy- lifting and performing work in a prolonged awkward posture. Upper limbs and back area are the most prevalent area of pain. Based on the QEC exposure score analysis, shoulder, arms and back region are parts of the body that obtained high risk score. There are many factors that contributed in the development of WMSDs among catering workers. Beside aforementioned physical factors, gender differences have also been proved by previous research as contributors to the WMSDs.

However, in the present study, gender issue did not show any differences between male and female. With the rapid economic development and improved living standards in the country, catering industry is also blooming, especially in the cities. Therefore WMSDs in the catering industry is an important aspects to be explored further. The contributinal factors should be addressed accordingly so that the control measure can be proposed as per required. Theoretical learning and practical trainings along with ergonomics interventions are among the solutions to reduce the risk factors and discomfort levels in the workplace setting. On top of that, in any organization, employers should take effective actions while employees are advisable to follow the standard working procedures to prevent WMSDs.

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