



The Prevalence and Risk Factors of Musculoskeletal Disorders among Burmese Migrant Labor in Thailand

Parvena Meepradit^{1*}

¹Department of Industrial Hygiene, Faculty of Public Health, Burapha University, Chonburi, Thailand.

Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

Introduction: Work-related musculoskeletal disorders (WMSDs) are significant problems in Thailand. However, only limited researches have been conducted on the situation concerning migrant workers. Therefore, to achieve equality in health surveillance for migrant people, this research has been aimed at investigating the prevalence and risk factors associated with the musculoskeletal system among the migrant workers in Samut Sakhon province.

Methodology: A cross sectional study was conducted randomly on all 303 Burmese workers. A self-administered questionnaire was used for recording the socio-demographic data, risk factors and musculoskeletal symptoms among the samples.

Results: The prevalence of musculoskeletal disorders having the most commonly reported complaints concerned with the low back reaching at 47.9% , followed by the shoulder with 41.6%, upper back 37.0%, neck 34.0%, hand / wrist 20.5%, knee 17.5%, thigh 17.2%, ankle / foot 16.8%, and elbows 10.6% respectively. Most of the symptoms were defined as pain occurring in the past 7 days. Moreover, the results pointed out that the personal and work-related factors associated with the musculoskeletal disorders were significant.

Conclusion: From the results, it should be suggested that effective intervention strategies, most likely, have to be taken into account for both demographic and ergonomic factor aspects.

*Corresponding author: E-mail: pravena15@yahoo.com;

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1. INTRODUCTION

The migrant workers or transnational workers, as used in this research, are individuals who do not have the Thai nationality, and search for work by using their physical force or knowledge with the intention to earn money or get any other benefits. They are aliens who apply for permission to work lawfully to promote investment or industrial estates. They have to apply for a work permit within 30 days from the date of entry into Thailand, or 30 days from the date after receiving the note allowing them to work legally. The aliens who are residents in Thailand or the aliens who come into Thailand for sojourn will apply for a license only once by filing up an application form asking for a work permit under the law [1].

Samut Sakorn is one of the provinces with many migrant workers. According to the labor registration record of the Department of Employment, in October 2012 there were 192,873 migrants from Burma, Laos and Cambodia who were legally allowed to work. In addition, the 100,000-200,000 migrant workers without a work permit escaped to be residents. These laborers are absolutely important and need respect for human dignity. The migrant workers management and coexistence in Thailand are relevant issues to be dealt with by both public and private sectors of this province. The serious problems that have to be considered include the lack of education, no access to basic workers' rights and public services as well as adequate health care. The capacity of existence, valuable life and effective activities should continue to raise awareness of living together in peace as well as complementing with each other [2].

Work-related musculoskeletal disorders (WMSDs) have high prevalence rate among Thai workers. The Social Security Office Compensation fund statistics in 2013 had shown 3,146 WMSDs cases equivalent to 79.4% of all severe work-related diseases claimed for worker's compensation fund that impacted on the economic and health service system as well [3].

The above details show that work associated with musculoskeletal sickness occurred due to the inefficiency of health surveillance and management as well as safety, occupational health and environmental condition in the

workplace. However, the literature reviews revealed that there had been very few researches conducted on the situation among migrant workers who have the characteristics of work identity. The migrant workers migrated into Thailand periodically, so the duration of the work may be for only short periods. This group was also the lower educated workers that might be found working with the tasks of more extreme physical demands which gave them a high risk of getting MSDs. Therefore, to achieve equality in health surveillance for migrant workers, the researcher had studied the prevalence and risk factors associated with musculoskeletal disorders among migrant workers in Samut Sakhon (a province of Thailand) to provide baseline data for monitoring the health care for migrant workers.

2. METHODS

A cross-sectional study was carried out among Burmese workers in Samut Sakhon Province, Thailand. The duration of data collecting was from September 2013 to August 2014.

2.1 Participants

A total of 303 Burmese migrant workers were selected by simple random sampling and invited to participate in the study. Written consent was obtained from the participants before the distribution of the questionnaires that were returned on the same day after completion.

2.2 Instrument

Demographic characteristics, work-related risk factors and musculoskeletal disorders (MSDs) were collected using a self-administered questionnaire adopted from Quick Exposure Check (QEC) [4] and Nordic Musculoskeletal Questionnaire [5]. The questions were written in Burmese soliciting information in three main areas: Section A: Socio-demographic characteristics; Section B: Work-related risk factors; and Section C: Musculoskeletal disorders.

2.3 Ethical Considerations

The study was approved by the Burapha University Ethics Committee. Participation in this study was on voluntary basis; every respondent was given a copy of the consent form. As for

the assurance of privacy and confidentiality, the information was also given to the participants.

2.4 Data Analysis

The data from the completed survey questionnaires were entered into the computer for descriptive and statistical analysis. Chi-square tests were used to determine the association between demographic characteristics and work-related risk factors with the musculoskeletal disorders.

3. RESULTS

A total of 303 Burmese migrant workers participated in the study. The majority of the workers were male (57.4%) aged between 21-30 years. Approximately 83% of the participants completed at least secondary school. Most participants (68%) were with their wives or husbands. The results also showed that 71% of workers never smoke, 89.4% and 86.8% have no accidents or diseases effecting musculoskeletal disorders.

The prevalence of musculoskeletal disorders showed that the low back was the part mostly affected with 47.8% and followed by the shoulders with 41.6%, upper back 37%, neck 34%, hands /wrists 19.1%, knees 17.5%,

hips/thighs 17.2%, ankles/feet 16.8%, and elbows 10.6% respectively. Moreover, it was found that the onset of musculoskeletal symptoms occurred within a period of seven days in every organ (Table 1).

The level of the individuals participating in the work system and influences their exposure to a range of risk factors for MSDs to be assessed include the following: Back posture, back movement, shoulder/arm position, shoulder/arm movement, wrist/hand posture, wrist/hand movement, neck posture, maximum weight handled, time spent on task, maximum force level, visual demand, driving, vibration, work pace, and stress with their details shown on Table 2.

Table 1. The prevalence of musculoskeletal disorders

Trouble with the locomotive organs	n (%)	
	Yes	No
1. Neck	103 (34.0)	200 (66.0)
2. Shoulders	126 (41.6)	177 (58.4)
3. Elbows	32 (10.6)	271 (89.4)
4. Hands /Wrists	58 (19.1)	245 (80.9)
5. Upper back	112 (37.0)	191 (63.0)
6. Low back	145 (47.8)	158 (52.2)
7. Hips/Thighs	52 (17.2)	251 (82.8)
8. Knees	53 (17.5)	250 (82.5)
9. Ankles/Feet	51 (16.8)	252 (83.2)

Table 2. Work-related musculoskeletal risk factors of migrant workers

Work-related musculoskeletal risk factors	n (303)	%
1. Back posture		
Almost neutral	180	59.4
Moderately flexed/twisted side bent	91	30.0
Excessively flexed/twisted side bent	32	10.6
2. Standing or seated stationary task		
No	99	32.7
Yes	204	67.3
3. Lifting, pushing/pulling or carrying task		
No	204	67.3
Infrequent (around 3 times per minute or less)	40	13.2
Frequent (around 8 times per minute)	32	10.6
Very frequent (around 12 times per minute or more)	27	8.9
4. Shoulder/arm position		
At or below waist height	153	50.5
At about chest height	99	32.7
At or above shoulder height	51	16.8
5. Shoulder/arm movement		
Infrequent (some intermittent movement)	12	4.0
Frequent (regular movement with some pauses)	130	42.9
Very frequent (almost continuous movement)	161	53.1

Work-related musculoskeletal risk factors	n (303)	%
6. Wrist/hand posture		
An almost straight wrist	147	48.5
A deviated or bent wrist	156	51.5
7. Wrist/hand movement		
10 times per minute or less	80	26.4
11 to 20 times per minute	111	36.6
More than 20 times per minute	112	37.0
8. Neck posture (bent or twisted greater than 20°)		
No	194	64.0
Yes, occasionally	93	30.7
Yes, continuously	16	5.3
9. Maximum weight handled		
Light (5 kg or less)	95	31.4
Moderate (6 to 10 kg)	34	11.2
Heavy (11 to 20kg)	62	20.5
Very heavy (more than 20 kg)	112	37.0
10. Time spent on task		
Less than 2 hours	2	0.7
2 to 4 hours	6	2.0
More than 4 hours	295	97.3
11. Maximum force level		
Low (e.g. less than 1 kg)	130	42.9
Medium (e.g. 1 to 4 kg)	53	17.5
High (e.g. more than 4 kg)	120	39.6
12. Visual demand		
Low (almost no need to view fine details)	134	44.2
High (need to view some fine details)	169	55.8
13. Driving		
Less than one hour per day or Never	290	95.7
Between 1 and 4 hours per day	5	1.7
More than 4 hours per day	8	2.6
14. Vibration		
Less than one hour per day or Never	270	89.1
Between 1 and 4 hours per day	8	2.6
More than 4 hours per day	25	8.3
15. Work pace		
Never	192	63.4
Sometimes	71	23.4
Often	40	13.2
16. Stress		
Not at all stressful	233	76.9
Mildly stressful	63	20.8
Moderately stressful	3	1.0
Very stressful	4	1.3

The relationships between the demographic factors and musculoskeletal disorders were examined. There were significant associations between sex with MSDs at the neck, shoulders, hips/thighs, and ankles/feet. Age was also associated with MSDs occurring especially at the neck, shoulders, elbows, hand/wrists, upper back, low back, and hips/thighs. Concerning education in relation with MSDs, the finding showed that MSDs occurred mostly at the neck

and knees, and with marital status factor, MSDs are found at the low back, knees, and ankles/feet. For smoking factor, MSDs attacked the victims on the neck, shoulders, hands/wrists, and low back. As to accident-related MSDs, the results of the study revealed that MSDs were found at the shoulders, elbows, low back and hips/thighs. And for disease-related MSDs, they are on the neck, elbows, hips/thighs, knees, and ankles/feet ($p < 0.05$).

The association between the risk factors exposed during work in relation to musculoskeletal disorders was analyzed. There was a significant relationship between work-related exposures and MSDs at the organs as shown below ($p < 0.05$);

- Standing or seated stationary task with neck and knees
- Lifting, pushing/pulling or carrying task with upper back
- Shoulder/arm movement with shoulders, elbows, and low back
- Wrist/hand movement with neck, elbows, and hands/wrists
- Neck posture and visual demand with neck, shoulders, and upper back

4. DISCUSSION

The prevalence of musculoskeletal disorders with the most commonly reported complaints at the low back as the acute symptoms was defined as pain in the past 7 days. Moreover, the results were found that the personal and work-related factors were associated with the musculoskeletal disorders. Therefore, it is suggested that effective intervention strategies have to be taken into account for both demographic and ergonomic factors.

This study has found the prevalence of musculoskeletal disorders (MSDs) among migrant workers getting a total of 47.9% at the low back mostly with the majority of trouble duration lasting for seven days. A similar finding was also reported in the study by Chalardlon, T. and Anansirikasem, P. who found the prevalence of MSDs among call center workers who had the symptom in the past 7 days at the low back with 58.46% [6].

The individual factors are often construed as non-workplace factors that contribute to work-related MSDs, so this study has sought to determine the MSDs with various socio-demographic characteristics. The result found that women faced the MSDs trouble at their neck, shoulders, hips/thighs, and ankles/feet more than men. A similar finding was also reported in the study by Treaster and Burr who found that women accounted for the higher incidences of various types of upper extremity MSDs than men [7]. The reason is that women are more sensitive to pain and percept the severity of pain more than men. This may be related to hormonal factors as the considerable

research indicates increased experience of clinical pain among females relative to males, and females also demonstrate enhanced responses to experimentally-induced pain [8]. Considering women, they are overrepresented in light and monotonous jobs that require precise and repetitive hand motion with less latitude for decision-making. Men are often found in jobs with heavy whole-body workload such as manual materials handling. In general, once job assignments and the consequences of occupational exposures are taken into account, sex differences become negligible [9].

Regarding the relationship between age and MSDs, the results of this study have shown that MSDs were found at the neck, shoulders, elbows, hand/wrists, upper back, low back, and hips/thighs. The studies found that age represented the cumulative exposure and decreased tolerance [10]. Similarly, the finding by Montreuil S, Laflamme L, and Tellier C. showing the differences regarding age was portrayed in relation to the proportion of workers having body pain symptoms [11]. Yet, age is a difficult variable to de-construct. It is a measure of cumulative exposure, declining tissue tolerance, or greater experience and skill among the other factors [10].

Education was also found having association with neck and knees MSDs that might be due to the recruiting of workers based on their education that led to the varying individual work positions. The lower educated workers are often found working in tasks with more extreme physical demands that caused MSDs. Finally, the marital status had also been associated with MSDs at the low back, knees, and ankles/feet. Divorced and widowed- injured workers took considerably longer time to return to work or go off; temporary total workers received more compensation benefits than those who were single or married [12].

The worker's lifestyle such as smoking was also related with MSDs at the neck, shoulders, hands/wrists, and low back. The study by Andrew E. Lincoln & et al found the trends between increased smoking level and long-term disability and were identified for persons with knee injuries, rotator cuff injuries, and intervertebral disc displacement. In proportional hazards models, disability was significantly associated with heavy smoking among all subjects (relative hazard (RH) = 1.21). Both heavy smokers (RH = 1.49) and light to

moderate smokers (RH = 1.44) were at greater risk for disability following meniscal injuries. Excess fraction due to smoking among subjects with meniscal injuries who currently smoke was 38% [13]. The cigarette smoking has deleterious effects on the musculoskeletal system. The loss of bone mineral content and increased incidence of fractures are the best known negative consequences. The pathogenesis is complex, due to direct toxic effects on osteoblasts/osteoclasts activity of nicotine, and indirect actions on sex and adrenocortical hormones, vitamin D, intestinal calcium absorption, vessels and oxygen supply. Smoking may favor the onset or aggravate the progression of rheumatoid arthritis and back pain. Negative influences have been observed on muscle and on tendons. Moreover, smoking habit is associated to a number of short term post-operative complications and higher resource consumption. Smoking cessation is highly advisable with positive effects on the bone metabolism on the long term [14].

The past history as related to accidents and diseases represented the episode of MSDs and lower tolerance [10]. Both past history results showed the association with MSDs at almost every organ except wrists/hands and knees. The individuals' physiological status is another important factor that affects the development of certain musculoskeletal conditions. Some pathophysiological status likely alters chemical environments for joints as well, giving rise to conditions such as shoulder adhesive capsulitis and limited joint mobility among patients with type II diabetes mellitus [15].

The work-related musculoskeletal risk factors using the Quick Exposure Checklist (QEC) showed relationship with the MSDs. With regard to the finding, this study indicated significant relationship between the standing or seated stationary task with neck and knees, the lifting, pushing/pulling or carrying task with upper back, the shoulder/arm movement with shoulders, elbows, and low back, the wrist/hand movement with neck, elbows, and hands/wrists, and the neck posture and visual demand with neck, shoulders, and upper back. Similar results were also reported in a study where Nigeria used the QEC to assess MSDs while awkward posture was assessed using the arm reach ratio. 97.5% of respondents complained of pain in the shoulder region, while QEC put pains into regions above the shoulder/arm, back and the wrist. Results showed that stirring task was more

strenuous than loading and unloading and the sitting sideways posture as the most stressful posture. Also, overstretching was an identified risk factor for the population under study since the workers deviate from the neutral back position in an angle of $\theta = 77.22^\circ$ to the vertical. It was established that the gari-frying process is very tedious and has some ergonomic risks like repetitive stress, awkward posture and other risks of musculoskeletal disorders making the workers work in discomfort [16]. Based on all findings, they showed that the QEC might be useful to evaluate the risk of MSDS.

5. CONCLUSION

In summary, this study found the prevalence of MSDs among migrant workers and the causes might be both socio-demographic and the work-related factors. The samples of this study were the minority race in Thailand; they might be the potential construct in discrimination of the practitioners and policy makers. They need to consider them in order to reduce burden, to protect the vulnerable and to match interventions to different groups of people most appropriately. The impact of combined interventions can be substantially modified by individual factors. Moreover, the work station improvement for reductions of discomfort or troubles caused by MSDs should be modified [10].

COMPETING INTERESTS

Author has declared that no competing interests exist.

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