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ORIGINAL ARTICLE

WORK-RELATED MUSCULOSKELETAL SYMPTOMS AMONG BATIK WORKERS IN KELANTAN

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A cross sectional study was carried out to evaluate the extent of occupational health problems focusing on some aspects of musculoskeletal symptoms among batik workers in Kelantan, Malaysia. The workers selected must have been in that industry for at least one year. Using cluster sampling, 202 workers were selected from 21 factories. More than half (60.2%) of the workers had been troubled with musculoskeletal symptoms at work. The most common symptoms were pain over the shoulders (41.0%), lower back (34.4%) and ankle (34.4%). Duration of employment, younger age group, prolonged standing and awkward working task were among contributing factors. It is therefore necessary to improve on both ergonomic and psychosocial environments of batik workers in order to prevent these musculoskeletal symptoms.

Key words : *Batik workers, musculoskeletal symptoms and ergonomic*

Introduction

It has been known that small-scale industries present particular occupational health and safety problems. The workers of these industries are more prone to have health and safety problems since occupational health services are not readily accessible to them. Most of these companies employ too small a staff number to warrant the provision of their own individual occupational health service. Among the potential dangers posed in these industries are ergonomic and chemical hazards. These jobs require prolonged standing and manual handling. People who continuously stand while performing work are more likely to suffer from pain and aching in the extremities and lower back than others (1,2,3). Kourinka *et al* reported ergonomic factors such as awkward working postures, static load and task invariability to be some of the most important factors contributing to occurrence of musculoskeletal symptoms (4). Musculoskeletal disorders account for a large number of worker's compensation days and functional disability in the Western world.

The batik industry in Kelantan believed to have begun in the early 20th century, contributes significantly to the state Gross Domestic Products. Many of these factories are located in the backyards of homes and are usually run as family business.

To our knowledge there have been no epidemiology reports on occupational health and safety problems among batik workers in Kelantan, Malaysia. The present study aims to elucidate some of the health problems associated with the batik industry such as chronic disease, workstress and other occupational health problems. This study also specifically focuses on ergonomic issues in the workplace and it's association with musculoskleletal symptoms.

Method

This is a cross-sectional epidemiological study using a structured questionnaire interview. The study was conducted between June and October, 1998 in selected batik factories in Kelantan. All factories with more than five workers were identified and selected to participate in this study. Using cluster sampling, a total of 28 factories that fulfill the above criteria were identified. However only 21 factories agreed to participate. All workers who have been in the industry for at least one year and who were available during the study period (except administrative staff) were included in this study. The questionnaire comprised sociodemographic data and general health information. Work-related musculoskeletal symptoms were sought using a body map that was modified from a Standardized Nordic Questionnaire (SNQ) for analysis of musculoskeletal symptoms (5). The availability of health services and workers' welfare were also asked. This included the availability of panel doctors, residence doctors and general medical facilities. The data collection was done by two research assistants who were given prior training. Pilot testing was done in the same industries which were not from the sampling frame. Minor modifications were made based on the feedback given. Data collected were entered and analysed using Epi Info (6) computer package. Sample proportions were compared by Chi-Square test. Student's t-test was used to compare means of quantitative variables. The significant level used for evaluating the test of significance was set at 0.05.

Results

A total of 21 employers and 202 employees were willing to participate in this study .The mean age of the employees was 33.6 years, with the range from 16-59 years, the mean period of employment in the industries was 3.8 years. A total of 40.6% (82) were male employees and 59.4 % (120) were females.

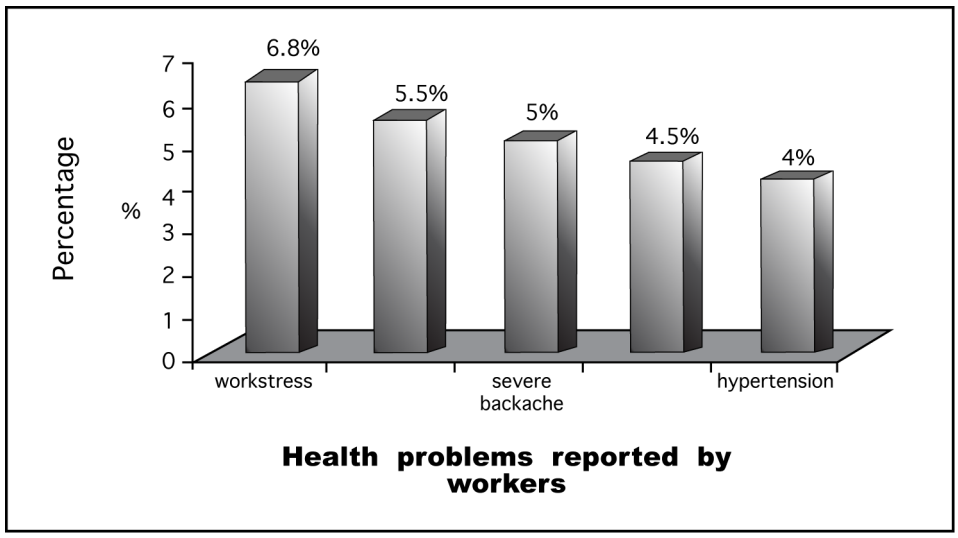
General health problems

Respondents were asked a series of questions about health problems such as diabetes, hypertension and other general diseases (such as tuberculosis, renal diseases or any malignancy) over the past 5 years.

A majority of the respondents denied having any of the above problems. However, a small proportion of workers said that they have 'work-stress'-6.5%, dysmenorrhea (menstrual pain that intefere with daily activities)-5.5%, severe backache (that stops them from working)-5%, irregularity in menses-4.5 % and hypertension (whether told by the doctor or are on treatment) - 4.0%. (Figure 1)

The employees were also asked regarding their major body position or movement while performing their daily work. There were 76.2% (154) employees who claimed that they were standing for more than four hours throughout their working period/shifts. Other movements undertaken for more than four hours per day were hand and wrist movements (64.9 %,131 workers) and movements

Figure1: Distribution of the health problems among workers. Health problems among batik workers in Kelantan, Malaysia (1998)



involved with bending and stooping, (19.8 %, 40). A total of 60.2% of the employees reported that they have been troubled with pain or discomfort in one or more defined parts of the body. Pain was more common (82, 68.3%) in female workers, compared to male workers (39, 32.7%, p=0.004). Among the most common parts experiencing pain were the shoulders 41.0% (50 workers), lower back 34.4% (40 workers) and ankles or feet 34.4% (40 workers).

Fig 2 shows the distribution of the defined parts of the body where the pain/discomfort was experienced by the workers.

Lower backache, shoulder pain, and pain over the ankles/feet were significantly related to new workers with their duration of employment of less than five years ($p<0.05$). Low backache was also associated with younger age. Ankles/feet pain was significantly related to prolonged standing ($p<0.05$).

Table 1 shows the association between pain experienced and factors associated with it.

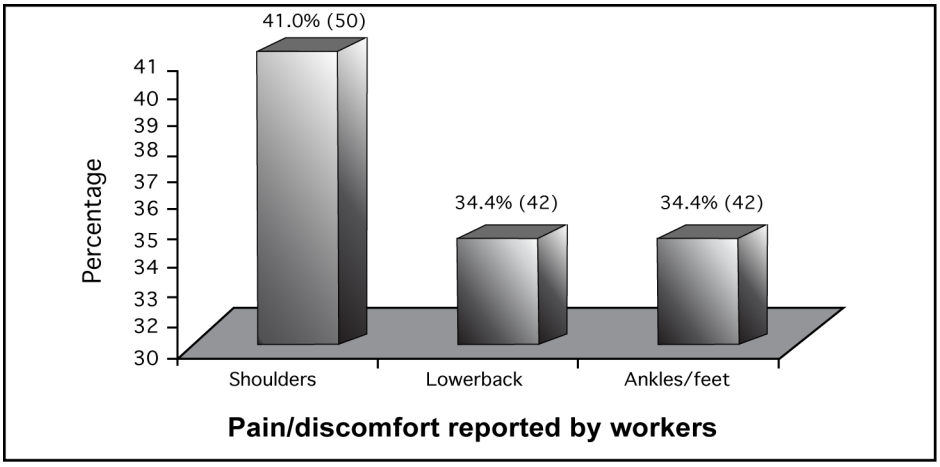
Health and safety prevention and workers' welfare

A majority of the workers (81.2%) felt there were not sufficient health and safety warning notices in their workplace. In addition, most of the workers claimed that they were not provided with necessary personal protective equipments such as boots (94.6%), gloves (93.6%) and aprons (80.2%). Only 29.7% of the workers reported availability of a first aid box in their workplace. Half (56.4%) of the workers said that their workplace was equipped with a fire extinguisher. Only 2.5 % of the workers were covered by any insurance scheme (Social and Security Organisation).

Discussion

More than half (60.2 %) of the batik workers reported having musculoskeletal problems at work. Shoulder pain was the most common reported symptom among the batik workers. The other most troublesome symptoms were lower back and ankle pain. The present study also showed association between the workers' symptoms and their duration of employment. Age and prolonged standing were among other factors which contributed to their symptoms. These findings were consistant with their nature of daily task, namely prolonged working postures with their arms flexed at or above shoulder level. There was particularly good evidence for an association between shoulder tenderness and working with the arm flexed or abducted[4]. In addition , psychosocial factors such as high workload and pacing, and lack of support were also suggested as possible risk factors in other studies (7-9). Houben *et al* found that "occupational strain "(physical climate and psychosocial factors) correlated significantly with locomotor problems (10). This correlation was quite evident in the working environment of these batik workers. Their workplace was not satisfactorily conducive for daily, task. In this cross sectional study, a "healthy worker's effect" might be expected since workers with severe musculoskeletal problem are not likely to stay long in this type of work. This finding is supported by the fact that the mean age of the batik workers in this study was relatively young. Since the data collection was based on self-reporting it may be possible that the workers have over reported their symptoms because they may have been interested

Figure 2: Distribution of pain/discomfort experienced by batik workers in Kelantan, Malaysia (1998)



in an improvement of their workplace. This study highlighted the high prevalence of musculoskeletal symptoms among batik workers. It therefore seems necessary to improve both the ergonomic and workplace environment to reduce this problem. Important aspects that need attention include workstation design, working environment and welfare of the workers.

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Table 1: Factors associated with musculoskeletal symptoms

Employee's characteristics/factors	**Symptoms experienced (pain/discomfort)**			
1. Duration of employment	**Lowerbackache**		**Total**	**p.Value**
	Yes	No		
< 5 years	39	63	102	
≥ 5 years	3	17	20	
Total	42	80	122	0.046
	shoulder			
	Yes	No	Total	
< 5 years	37	65	102	
≥ 5 years	13	7	20	
Total	50	72	122	0.017
	Ankles/feet			
< 5 years	47	33	80	
≥ 5 years	33	9	42	
	80	42	122	0.03
2. Age	**Lower backache**			
	Yes	No	Total	
< 35 years	32	45	77	
≥ 35 years	10	35	45	
Total	42	80	122	0.03
3. Prolonged standing	**Ankles/feet**			
	Yes	No	Total	
< 4 hours	2	7	9	
≥ 4 hours	40	73	113	
Total	42	80	122	0.024

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