Physical Fitness and Muscular Discomfort among Informal Garment Female Workers in Udon Thani Province, Thailand

Thanyawat Homsombat MPH*, Sunisa Chaiklieng Dr.biol.hum**

** PhD program in Exercise and Sport Science, Graduate School, Khon Kaen University, Khon Kaen, Thailand*
*** Department of Environmental and Occupational Health, and Safety, Faculty of Public Health, Khon Kaen University, Khon Kaen, Thailand*

Background: *Musculoskeletal disorders (MSDs) are common complaints among workers who work in intensive manual labor including informal workers. Workers who have worked with prolonged improper posture have clearly decreased their physical fitness and increased the risk of musculoskeletal disorders.*
Objective: *This cross-sectional study aimed to investigate the prevalence of muscular discomfort and to assess the physical fitness of informal garment female workers.*
Material and Method: *The subjects were 1,674 informal garment female workers in Udon Thani Province. Data were collected by using a structured questionnaire including complaints of muscular discomfort. Physical fitness tests were done by using standard tools for testing back-leg strength, flexibility and hand grip strength.*
Results: *The highest complaint of muscular discomfort during the last month was located at the low back (41.75%), followed by the shoulders (41.21%). Considering the severity as severe discomfort, the highest prevalence was found at the low back (61.47%), followed by neck (61.23%). Those two areas were also presented as the highest frequency of discomfort for every day pain. In general, the majority of workers had physical fitness at fair level and low back strength significantly correlated with muscular discomfort.*
Conclusion: *The significant findings among informal garment workers were muscular discomfort predominantly located on the low back and the factor of low back strength correlated with that muscular discomfort. The suggestion is there should be a supporting surveillance program for prevention of chronic low back pain by a prospective cohort study as well as maintaining the physical fitness by an exercise program for these informal garment workers.*

Keywords : *Informal workers, Low back pain, Back strength, Prevalence, Garment*

J Med Assoc Thai 2017; 100 (2): 230-238
Full text. e-Journal : *http://www.jmatonline.com*

Musculoskeletal disorders (MSDs) are common complaints among workers in many industries, particularly among workers with intensive manual labor, as The leading cause of work related illness. The so-called work-related musculoskeletal disorders (WMSDs) are a group of painful disorders of muscles, tendons, and nerves induced by work activities and work environment[1]. Inappropriate work site environment and lack of effective prevention MSDs program can cause MSDs.

In Thailand, 2014, there were about 22,124,711 informal workers (54.80% of males, 45.20% of females), in Northeast, there were about 7,765,773 informal workers (35.10%). In Udon Thani province, Thailand, 2009, there were about 786,614 informal workers (59.12% of males, 40.78% of females), where also locates the highest number of informal workers compared to other regions[2]. Some of them were 1,674 garment female workers. In each area of work, these workers were exposed to the work with many environmental hazards, one of those was ergonomics hazards which were normally found as the main cause

Correspondence to:
Chaiklieng S, Department of Environmental and Occupational Health, and Safety, Faculty of Public Health, Khon Kaen University, Khon Kaen 40002, Thailand.
Phone and Fax: +66-43-362076
E-mail: csunis@kku.ac.th

of WMSDs in garment work[3,4]. Working with static posture every day for a long period of time may cause painful diseases and degenerative muscles that may include joints, tendons and soft tissues, where MSDs can occur. In addition, uncomfortable workstation or inappropriate designs of working equipments might be the important cause of MSDs as well. In the scientific literature, MSDs associated with physical work such as: manual materials handling, awkward posture by frequent bending and twisting, lifting objects overweight, repetitive work or prolonged posture by sitting[3]. Systematic reviews of epidemiologic studies have not been able to support a relationship of MSDs with prolonged sitting[5]. Despite the biological plausibility of such relationships and evidence for them from laboratory studies[6,7]. These inconsistent results could arise from a lack of precision in defining sitting postures. In fact, sitting postures at work vary as to duration and freedom to alternate postures. However few studies have measured these parameters of postural differences or taken them into account when studying the association between general working posture and MSDs[8]. Thailand's garment export is one important trade among the total export of about 195,311.6 U.S. dollars in 2010. Some of these were garments from 7,678 U.S. dollars which have increased about 19.2% from 2009. In addition, it was the major income of Thailand. Thai garment workers are employed as formal and informal sectors.

Physical fitness is an important factor for the workforces because if they have good level of fitness they can improve their work performance. Workers who are working with prolonged posture through half the day at least will have decrease in their physical fitness and an increased risk of musculoskeletal disorders[9].

Therefore, the present study aimed to investigate the prevalence of muscular discomforts and the physical fitness of informal garment female workers. The outcome would be a useful guideline for the muscular discomfort surveillance program among informal workers with prolonged static work.

Materials and Method

Subjects

The cross-sectional study was to investigate the prevalence of muscular discomfort and to assess the physical fitness among informal garment female workers in Udon Thani Province. The total subjects were 2,013 informal garment female workers registered to be a informal garment female workers at Udon Thani municipality in Udon Thani Province. The sample size was calculated to detect the prevalence of MSDs using an approach of a simple method of calculation in cross-sectional analytic study for simple logistic regressions[10]. The prevalence rate of MSDs among sewing machine operations was 37% ($P_2 = 0.37$)[11]. The desired level of confidence was 95% ($\alpha = 0.05$) and power of 80% ($\beta = 0.20$). Therefore, a minimum requirement of the sample size in simple logistic regressions was 1,483 informal garment female workers. Subject's recruitment criteria based on the following inclusion criteria were; Thai citizens and volunteers, ages between 30-60 years old, working as garment workers for at least 8 hours per day and at least 4 hours continuous, work experience for at least 1 year and working in Udon Thani province, no history of an episode of care for low back pain in the past three months, not pregnant, no medical history of serious injury and no congenital pathology or severe disability with surgeries. The final number of was 1,674.

Materials

The Standardize Nordic Questionnaire was used to estimate the muscular discomfort, the Frequency and Severity of Pain Questionnaire was applied from Chaiklieng et al (2010)[12]. Cronbach's alpha coefficient was used to evaluate the reliability of the questionnaire, such that high internal consistency was indicated by values of 0.92 for severity of pain and 0.86 for frequency of pain. The severity of pain was classified into 3 levels: mild, moderate and severe, and the frequency of pain was classified into 3 levels: occasional (1-2 times/wk), frequent (3-4 times/wk) and everyday (≥5 times/wk). Physical fitness tests were done by standard back and leg dynamometer for testing back-leg strength, the standard sit and reach box for testing flexibility and the standard hand grip dynamometer for testing hand grip strength.

Data collection

Data was collected during June to July 2013 by interviewing informal garment female workers at their home workplace by the researcher and 2 research assistants and a measurement of physical fitness for back strength, leg strength, flexibility and hand strength

Table 1. Demographic characteristics of informal garment female workers (n=1,674)

Variables	n (%)	Variables	n (%)
Age		Working hour/day	
- 30-39 years old	362 (21.62)	- <8 hrs.	196 (11.71)
- 40-49 years old	512 (30.58)	- ≥8 hrs.	1,478 (88.29)
- 50-59 years old	423 (25.27)	Working day/week	
- ≥ 60 years old	377 (22.52)	- ≤6 day	398 (23.78)
Education		- 7 day	1,276 (76.22)
- Illiterate	425 (25.38)	Dust exposure	
- Primary school	543 (32.43)	-No	659 (39.37)
- Secondary school	441 (26.34)	-Not sure	536 (32.02)
- Diploma	146 (8.72)	-Yes	479 (28.61)
- Others	119 (7.10)	Hot exposure	
Work experience		-No	537 (32.08)
- <2 years	121 (7.23)	-Not sure	705 (42.11)
- 2-4 years	448 (26.76)	-Yes	432 (25.81)
- >4-6 years	376 (22.46)	Lighting	
- 6-8 year	612 (36.56)	-Non sufficient	561 (33.51)
- >8 years	117 (6.99)	-Not sure	642 (38.35)
Prolong posture per day		-Sufficient	471 (28.14)
- No	490 (29.26)	Vibration form electric sewing machine	
- Yes	1,184 (70.74)	-No	1,099 (65.65)
-Sitting ≥ 2 hrs/day.	828 (69.93)	-Yes	575 (34.35)
-Standing ≥ 2 hrs/day.	813 (68.67)		

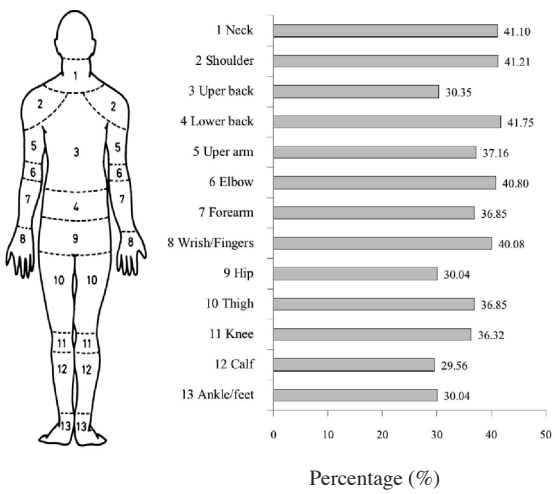

Fig. 1 Prevalence of muscular discomfort of the last month (n = 1,674).

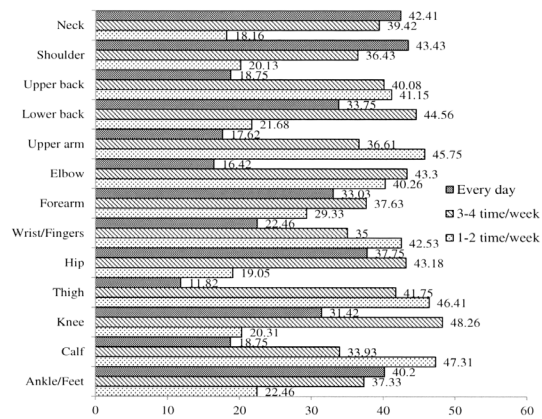

Fig. 2 Frequency of muscular discomfort during the last month (n = 1,674).

by the researcher. The standard of testing for physical fitness followed the Sport authority of Thailand (2013) [13]. The results of physical fitness was classified into 3 levels; poor, fair and good.

The present study was approved by the Khon Kaen University Ethics Committee for Human Research based on the Declaration of Helsinki, as registered no. HE 562131. All participants were volunteers

Table 2. Severity levels of muscular discomfort during the last month (n = 1,674)

Body part	Severity levels of muscular discomfort		
	Mild (1) n (%)	Moderate (2) n (%)	Severe (3) n (%)
1. Neck	142 (8.48)	507 (30.29)	1,025 (61.23)[2]
2. Shoulder	494 (29.51)	588 (35.13)	592 (35.36)
3.Upper back	490 (29.27)	583 (34.83)	601 (35.90)
4.Lower back	164 (9.80)	481 (28.73)	1,029 (61.47)[1]
5. Upper arm	456 (27.24)	622 (37.16)	596 (35.60)
6. Elbow	468 (27.96)	594 (35.48)	612 (36.56)
7. Forearm	462 (27.60)	633 (37.81)	579 (34.59)
8.Wrist/Fingers	480 (28.67)	580 (34.65)	614 (36.68)
9. Hip	503 (30.05)	593 (35.42)	578 (34.53)
10. Thigh	174 (10.39)	528 (31.54)	972 (58.06)[3]
11. Knee	505 (30.17)	601 (35.90)	568 (33.93)
12. Calf	504 (30.11)	580 (34.65)	590 (35.24)
13. Ankle/feet	489 (29.21)	598 (35.72)	587 (35.07)

Table 3. The physical fitness of informal garment female workers (n=1,674)

Variables	Level		
	Poor (%)	Fair (%)	Good (%)
Flexibility	522 (31.18)	1,098 (65.59)	54 (3.23)
Leg strength	0	1,570 (93.79)	104 (6.21)
Back strength	0	1,570 (93.79)	104 (6.21)
Grip strength	49 (2.93)	1,606 (95.94)	19 (1.14)

to this study and they were given their informed consent prior to the start.

Statistical analyses

Statistical analysis by using STATA 13, Texus USA 2007. The descriptive statistics were frequency, percentage, mean and standard deviation (SD). Physical fitness was classified into two levels: poor to fair and good level. Simple logistic regression analysis was used to evaluate the association between personal factors and physical fitness variables with muscular discomfort. The significant factors were identified by p-value less than 0.05, odds ratio (OR) and 95% confidence intervals (95%CI). The prevalence of muscular discomfort during the last month was calculated from the formula of: prevalence rate = (number of muscular discomfort cases during the last month x 100) / number of informal garment female workers in the study.

Results

Characteristics and working environments

The results showed that, among 1,674 informal garment female workers, ages ranged between 30-60 years old. Most workers had an education level lower than secondary school, their work experience generally ranged between 2-8 years. Regarding their working conditions, nearly all of them had prolonged posture during working (70.74%), they worked longer than 8 hours per day (88.29%) or 7 days per week (72.22%) by sitting more than 2 hours of day time (69.93%) and standing more than 2 hours of day time (68.67%). In addition, some workers reported about hot working environment (25.81%), dust (28.61%), and vibration from electric sewing machine for working (34.35%) (see Table 1).

Table 4. The association between personal factors or work characteristics and muscular discomfort (n = 1,674)

Variables	Muscular discomfort		OR	95% CI	*p*-value
	Yes (%)	No (%)			
Age					
- ≥ 40 years old	536 (52.86)	478 (47.14)	1.01	0.99-1.02	0.19
- <40 years old	323 (48.94)	337 (51.06)	1		
Education					
- Primary or secondary school	515 (51.86)	478 (48.14)	0.95	0.78-1.15	0.59
- Higher than secondary school	344 (50.51)	337 (49.49)	1		
Work experience					
- ≥6 years	580 (51.10)	555 (48.90)	1.01	0.97-1.04	0.88
- <6 years	279 (51.76)	260 (48.24)	1		
Prolong posture					
- Yes	579 (48.90)	605 (51.10)	0.72	0.58-0.89	0.002*
- No	280 (57.14)	210 (42.86)	1		
Sitting ≥2 hrs					
- Yes	541 (50.85)	523 (49.15)	0.95	0.78-1.16	0.61
- No	318 (52.13)	292 (47.87)	1		
Standing ≥2 hrs					
-Yes	747 (50.54)	731 (49.46)	0.77	0.57-1.04	0.08*
- No	112 (57.14)	84 (42.86)	1		
Working hour per day					
- ≥ 8 hrs.	562 (52.38)	511 (47.62)	1.13	0.92-1.37	0.25
- < 8 hrs.	297 (49.42)	304 (50.58)	1		
Working day (day/week)					
- ≥6 day	558 (52.30)	509 (47.70)	1.08	0.88-1.31	0.46
- <6 day	335 (50.45)	329 (49.55)	1		
Dust exposure					
- Yes	524 (50.82)	507 (49.18)	1.18	0.97-1.44	0.09
- Not/not sure	307 (46.59)	352 (53.41)	1		
Hot exposure					
- Yes	510 (51.67)	477 (48.33)	1.04	0.85-1.26	0.73
- Not/not sure	349 (50.80)	338 (49.20)	1		
Lighting					
- Non sufficient	568 (51.64)	532 (48.36)	1.04	0.85-1.27	0.72
- Sufficient	291 (50.70)	283 (49.30)	1		
Vibration					
- Yes	563 (51.23)	536 (48.77)	1.01	0.83-1.24	0.92
- No	296 (51.48)	279 (48.52)	1		

*significant at *p*-value <0.05

Prevalence of muscular discomfort

Without consideration of severity and frequency of muscular discomfort, the top four positions of complaint during the last month were the lower back (41.75%), followed by the shoulders (41.21%), neck (41.10%) and elbows (40.80%) (see Fig 1). By considering severity at severe discomfort, the workers reported that the muscular discomfort predominantly located at the low backs (61.47%), neck (61.23%) and thigh (58.06%) (see Table 2). In addition, recorded the highest frequency levels of discomfort (every day pain), the complaint was located predominantly at the

Table 5. The association between physical fitness variables and muscular discomfort (n=1,674)

Variables	n	Muscular discomfort		OR	95% CI	*p*-value
		Yes (%)	No (%)			
Flexibility						
- Poor to fair	1,620	832 (51.36)	788 (48.64)	1.06	0.61-1.82	0.844
- Good	54	27 (50.00)	27 (50.00)	1		
Leg strength						
- Poor to fair	1,581	818 (51.74)	763 (48.26)	1.36	0.89-2.07	0.151
- Good	93	41 (44.09)	52 (55.91)	1		
Back strength						
- Poor to fair	1,570	818 (52.10)	752 (47.90)	1.67	1.12-2.51	0.012*
- Good	104	41 (39.42)	63 (60.58)	1		
Grip strength						
- Poor to fair	1,655	849 (51.30)	806 (48.70)	0.95	0.38-2.35	0.919
- Good	19	10 (52.63)	9 (47.37)	1		

*significant at p-value < 0.05

shoulders (43.43%), followed by the neck (42.41%) and the ankle/feet (40.20%) (see Fig 2).

Physical fitness of garment female workers

In general, the majority of workers had physical fitness at fair level for all variables. Most workers had flexibility at fair level (65.59%), followed by poor level (31.18%). None of the workers had leg strength and back strength at poor levels but a few workers had grip strength at poor level (2.93%) (see Table 3).

Risk factors related to muscular discomfort

From univariate analysis, the factor significantly related to muscular discomfort was prolonged posture (OR = 0.72, 95%CI = 0.58-0.89) (see Table 4) and the physical fitness factor significantly related to muscular discomfort was back strength (OR = 1.67, 95%CI = 1.12-2.51) (see Table 5).

Discussion

The results indicated that, without severity and frequency consideration, most complaints of muscular discomfort during the last month were at the lower back at 41.75%, followed by the shoulders. The reason of this adverse symptom might be static prolonged posture. These findings were supported by Janwantanakul et al. (2011)[14] who found that workers who had prolonged sitting posture for more than half a work day in both work with awkward postures and frequently bending forward had been leading to muscular discomfort. These findings were similar to Tamri et al (2007)[15] who confirmed that men who are sitting more than half of their workday in a car can be led to an increased risk of low back pain. By considering the severe level, the highest complaint was also at the lower back. Janwantanakul et al (2011)[14] explained before that prolonged sitting led to the load of the trunk muscles as fixed position which could limit the blood vessel in the muscles, reducing the blood supply, subsequently leading to muscles pain. The present finding of the highest frequency of discomfort (every day pain) was found at the shoulders (43.43%) and the neck (42.41%) and feet (40.2%). This finding was similar to a study by Wang et al (2007)[11] who found the highest prevalence of the neck/shoulder pain among sewing machine operators in Los Angeles. Moreover, this prevalence closed to the six month prevalence of shoulder pain among sewing occupation in Khon Kaen province of Thailand (47.0%)[16], and informal garment workers in the northeast of Thailand (49.0%)[17].

Univariate analysis indicated that workers with age ≥40 years had 1.7 times higher risk for muscular discomfort than workers with age <40 year, however, it was not significant identification (*p*-value = 0.19). Kozak et al (2014)[18] confirmed that the workers had a trend of increasing pain with increasing age among workers with ages >45 years. Dignan et al (1996)[19] also found that, manufacturing employees in the

South-Eastern United States who had age above 45 years were strongly associated with increasing MSDs rates. In contrast, Wang et al (2007)[11] found that sewing machine operators aged less than 30 years old had a higher prevalence of musculoskeletal disorders than their older co-workers.

The present finding supported that prolong posture was significantly related to muscular discomfort, this might be explained by the nature of their work. Mostly work postures who were sitting more than 2 hours a day (63.56%), standing more than 2 hours a day (64.10%) and working more than 8 hours a day (63.74%). The finding found in the present study was similar to the study by Tissot et al (2009)[11] who found that, working with prolong standing without freedom to sit was significantly related to low back pain. Prolong static posture among school teachers in China was strongly associated with low back pain[20]. Tissot et al. (2009)[11] confirmed that, prolonged standing posture might be leading to legs muscles fatigue and legs discomfort. It may lead to the developing of lower limb muscular discomfort, especially pain in the feet as found in the present study of discomfort of feet holding the third place of highest prevalence at everyday discomfort.

In general, the majority of workers had physical fitness at fair level for all parameters. The 31.18% of workers had flexibility at poor level but only 3.23% was at good level. The reason might be explained by working postures of sitting more than 2 hours, standing more than 2 hours and working more than 8 hours each day. These working postures have been regarded as the cause of muscles fatigue due to prolong muscles isotonic contraction and lactic acid accumulation[21]. From univariate analysis, workers who had bad back strength had significantly higher risk on muscular discomfort than those having good back strength (OR = 1.67, 95%CI = 1.12-2.51). Prolonged posture in a day clearly decreased in physical fitness and increased risk of musculoskeletal discomfort[9]. Muscle fatigue is the result of discomfort, thus the workers may be able to make muscles' work, but it will decrease their work performance[21]. In fact, workers can avoid the prolong posture by body stretching, or taking walks around their workstations[4]. Van Eijsden et al. (2009)[22] suggested that stretching exercises might help muscles for more strength and endurance, which could help eliminate muscle weakness and fatigue. We found the minority of workers who had physical fitness at a good level, which might help explain why the back strength factor significantly correlated with muscular discomfort.

Conclusion

Muscular discomfort during the last month among informal garment female workers was predominantly located at the low back (41.75%), shoulders (41.21%), and neck (41.10%). Thus, further clinical assessment is needed to confirm and the surveillance of the back pain among informal garment workers is needed by a prospective cohort study. The majority of workers had physical fitness at fair to poor for all parameters. Simple logistic regression indicated that low back strength significantly related to muscular discomfort.

To prevent muscular discomfort, promoting of exercise in workplaces is essential. In addition, the present finding found that prolong work activity significantly related to muscular discomfort, thus there should be promotion of awareness by ergonomics training to avoid prolonged and awkward posture at unfit garment workstations. Tambon health promoting hospital should promote exercise programs for awareness and maintaining good physical fitness among informal garment workers and measure the effectiveness of the implementation program for back pain prevention.

What is already known on this topic?

There might be some previous studies reported on musculoskeletal disorders among garment workers, particularly, the garment manufacturing workers. However, the prevalence was shown differently according to nature of work and workplace and nationality of workers. Prolong posture might be previously reported but had unclear correlation with discomfort.

What this study add?

In this cross-sectional study, data was collected by using structured questionnaire and also physical fitness tests among informal garment female workers. The present findings confirmed that back strength significantly related to muscular discomfort. For these reasons, we confirm that workers with poor back strength having higher risk of muscular discomfort than other workers had good back strength.

Workers reported their feeling or symptoms may be exaggerated and embarrassed to reveal real

details, the bias may affect the results. Therefore, the future research should be prospective cohort study to identify risk factors among large scale of informal garment female workers.

Acknowledgement

The authors thank all of the informal garment female workers who had kind co-operation throughout this study.

Potential conflicts of interest

None.

References

1. Punnett L, Wegman DH. Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. J Electromyogr Kinesiol 2004; 14: 13-23.
2. Ministry of Public Health, Thailand. Number and rates of out-patients according to 21 groups of causes from Health Service Unit, Ministry of Public Health [Internet]. 2009 [cited 2014 Dec 20]. Available from: http://service.nso.go.th/center/23project-th.htm
3. Nimbarte AD, Aghazadeh F, Ikuma LH, Harvey CM. Neck disorders among construction workers: understanding the physical loads on the cervical spine during static lifting tasks. Ind Health 2010; 48: 145-53.
4. Cole CD, Rivillis I. Individual factor and musculoskeletal disorders: framework for their consideration. J Electromyogr Kinesiol 2004; 14: 121-7
5. Chen SM, Liu MF, Cook J, Bass S, Lo SK. Sedentary lifestyle as a risk factor for low back pain: a systematic review. Int Arch Occup Environ Health 2009; 82: 797-806.
6. Nelson-Wong E, Gregory DE, Winter DA, Callaghan JP. Gluteus medius muscle activation patterns as a predictor of low back pain during standing. Clin Biomech (Bristol, Avon) 2008; 23: 545-53.
7. Gregory DE, Callaghan JP. Prolonged standing as a precursor for the development of low back discomfort: an investigation of possible mechanisms. Gait Posture 2008; 28: 86-92.
8. Laperrière E, Couture V, Stock S, Messing K. Validation of questions on working posture among standing workers in Québec. Int J Ind Ergon 2005; 35: 371-8.
9. Knapik JJ, Sharp MA, Canham-Chervak M, Hauret K, Patton JF, Jones BH. Risk factors for training-related injuries among men and women in basic combat training. Med Sci Sports Exerc 2001; 33: 946-54.
10. Hsieh FY, Bloch DA, Larsen MD. A simple method of sample size calculation for linear and logistic regression. Stat Med 1998; 17: 1623-34.
11. Tissot F, Messing K, Stock S. Studying the relationship between low back pain and working postures among those who stand and those who sit most of the working day. Ergonomics 2009; 52: 1402-18.
12. Chaiklieng S, Suggaravetsiri P, Boonprakob Y. Work ergonomics hazards for musculoskeletal pain among University office workers. Walailak J Sci Tech 2010; 7: 169-76.
13. Sport Authority of Thailand. The standard of physical fitness in Thai people [Internet]. 2013 [cited 2014 Dec 20]. Available from: http://www.mots.go.th/ewtadmin/ewt/mots_eng/ewt_news.php?nid=1525
14. Janwantanakul P, Pensri P, Moolkay P, Jiamjarasrangsi W. Development of a risk score for low back pain in office workers--a cross-sectional study. BMC Musculoskelet Disord 2011; 12: 23.
15. Bhattacherjee A, Bertrand JP, Meyer JP, Benamghar L, Otero SC, Michaely JP, et al. Relationships of physical job tasks and living conditions with occupational injuries in coal miners. Ind Health 2007; 45: 352-8.
16. Thotsathit N, Pentumetakul T, Eungpinichpong W, Peungsuwan P. Prevalence of Musculoskeletal disorders in sewing occupation in Khon Kaen province. Khon Kaen Univ Res J 2011; 11: 47-54.
17. Chaiklieng S, Suggaravetsiri P, Puntumetakul R. Prevalence and risk factors for work-related shoulder pain among informal garment workers in the northeast of Thailand. Small Enterprise Research 2014; 21: 180-9.
18. Kozak A, Schedlbauer G, Peters C, Nienhaus A. Self-reported musculoskeletal disorders of the distal upper extremities and the neck in German veterinarians: a cross-sectional study. PLoS One 2014; 9: e89362.
19. Dignan M, Hayes D, Main H, Parker K. Cumulative trauma disorders among apparel manufactur-

ing employees in the southeastern United States. South Med J 1996; 89: 1057-62.
20. Yue P, Liu F, Li L. Neck/shoulder pain and low back pain among school teachers in China, prevalence and risk factors. BMC Public Health 2012; 12: 789.
21. Zhao L, Yan W, Xiang H, Wang X, Qiao H. Proteomic investigation of changes in rat skeletal muscle after exercise-induced fatigue. Biol Res 2012; 45: 75-80.
22. van Eijsden MD, Gerhards SA, de Bie RA, Severens JL. Cost-effectiveness of postural exercise therapy versus physiotherapy in computer screen-workers with early non-specific work-related upper limb disorders (WRULD); a randomized controlled trial. Trials 2009; 10: 103.

สมรรถภาพทางกายและการปวดกล้ามเนื้อ ในแรงงานนอกระบบเพศหญิงที่มีอาชีพเย็บผ้าในจังหวัดอุดรธานี

ธัญญาวัฒน์ หอมสมบัติ, สุนิสา ชายเกลี้ยง

ภูมิหลัง: *ความผิดปกติทางระบบโครงร่างและกล้ามเนื้อปกติจะเกิดขึ้นกับผู้ใช้แรงงานรวมทั้งแรงงานนอกระบบซึ่งส่งผลให้เกิดปัญหาต่อสุขภาพ เป็นที่แน่ชัดว่าในแรงงานที่ทำงานในท่าเดียวนาน ๆ ย่อมส่งผลให้มีสมรรถภาพทางกายต่ำและเป็นปัจจัยเสี่ยงต่อความผิดปกติทางระบบโครงร่างและกล้ามเนื้อ*

วัตถุประสงค์: *การศึกษาแบบภาคตัดขวางมีวัตถุประสงค์เพื่อศึกษาความชุกของการปวดกล้ามเนื้อและสมรรถภาพทางกายของแรงงานนอกระบบเพศหญิงที่มีอาชีพเย็บผ้าในจังหวัดอุดรธานี*

วัสดุและวิธีการ: *กลุ่มตัวอย่างคือแรงงานนอกระบบเพศหญิงที่มีอาชีพเย็บผ้าในจังหวัดอุดรธานีทั้งหมด 1,674 คน เก็บข้อมูลโดยใช้โดยใช้แบบสอบถามมาตรฐานที่บ่งบอกถึงการปวดกล้ามเนื้อ และทดสอบสมรรถภาพทางกายโดยใช้เครื่องมือมาตรฐาน ได้แก่ การทดสอบความแข็งแรงของกล้ามเนื้อหลังและขา ทดสอบความอ่อนตัวและทดสอบความแข็งแรงของกล้ามเนื้อมือ*

ผลการศึกษา: *ความชุกของการปวดกล้ามเนื้อในระยะ 1 เดือนที่ผ่านมาโดยไม่คำนึงถึงความรุนแรงและความถี่พบตำแหน่งการปวดสูงสุดที่หลังส่วนล่าง (41.75%) และไหล่ (41.21%) เมื่อคำนึงถึงระดับของอาการปวดที่ระดับรุนแรงพบว่าตำแหน่งหลัง (61.47%) และคอ (61.23%) จะพบสูงสุด เช่นเดียวกับที่พบว่าตำแหน่ง 2 ตำแหน่งนี้มีความชุกสูงสุดเมื่อคำนึงถึงความถี่ของอาการที่ระดับปวดทุกวัน ด้านสมรรถภาพทางกายของแรงงานส่วนใหญ่อยู่ในระดับปานกลางทุกค่า และแรงเหยียดหลังมีความสัมพันธ์กับอาการปวดกล้ามเนื้อของแรงงาน*

สรุป: *จากผลการศึกษาพบว่าระดับความรุนแรงของการปวดกล้ามเนื้อส่วนมากเกิดขึ้นบริเวณหลังส่วนล่างและแรงเหยียดหลังที่ต่ำมีความสัมพันธ์กับอาการปวดกล้ามเนื้อ ด้วยเหตุผลนี้จึงควรมีการเฝ้าระวังโดยการศึกษาแบบติดตามไปข้างหน้าเพื่อศึกษาอุบัติการณ์ของการปวดหลัง นอกจากนั้นหน่วยงานที่เกี่ยวข้องควรมีการส่งเสริมการออกกำลังกายในแรงงานเพื่อรักษาระดับสมรรถภาพทางกายให้กับแรงงานและป้องกันโรคปวดหลังเรื้อรังต่อไปได้*
