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Rajan Balakrishnan
Senior lecturer, Asia metropolitan university, Malaysia.

Martin Ebenezer Chellappan
Senior lecturer, Malaysia.

Emalatha Changalai
Student, Asia metropolitan university, Malaysia.

Correspondence
Rajan Balakrishnan
Senior lecturer, Asia metropolitan university, Malaysia.

Prevalence of work-related musculoskeletal disorders among non-healthcare working population in different gender at Selangor

Rajan Balakrishnan, Martin Ebenezer Chellappan, Emalatha Changalai

Abstract
Title: Prevalence of work-related musculoskeletal disorders among non-healthcare working population in different gender at Selangor.
Background: Musculoskeletal disorders were reported to occur in some industries and occupations with rates more than three or four times higher than the average rate across all industries. Most of the study has been done among healthcare population and results shows higher rate of prevalence. Meanwhile, very less surveys has been done on WRMSD among non-healthcare working population.
Objective: To determine the prevalence of work related musculoskeletal disorders among non-healthcare working population in different gender at Selangor.
Method: A self administered questionnaire was distributed to 300 subjects through convenient sampling method at 6 offices, 3 companies and 4 schools around Selangor. 240 subjects were responded to the questionnaire. Out of 240 subjects, 176 subjects has been included in this study and 20 subjects eliminated due to incomplete answers in questionnaires and 44 subjects excluded because they doesn't meet the inclusion criteria. The questionnaires of 176 subjects has been analysed and tabulated according to gender differences.
Result: This study found that, the prevalence of WRMDs is significantly high among non-healthcare working population (77.3%) and women were reported to have more complaints of pain than men (78.8% vs. 74.6%).
Conclusion: This study concluded that there is high prevalence of WRMDs among non-healthcare working population. Musculoskeletal disorders have negative impact on job performance and leisure activities.

Keywords: musculoskeletal disorders, non-healthcare working population, self administered questionnaire etc

Introduction
During the past decades work related musculoskeletal disorders (WMDs) have become one of the most significant and costly health problems among the working population [1, 2]. Musculoskeletal disorders defined as injuries and disorders that affect the human body and musculoskeletal system [2]. Whereas, work-related musculoskeletal disorders (WMSDs) are group of painful disorders of muscles, tendon and ligaments which caused by frequent and repetitive work activities or activities with awkward working posture [3] Work –related musculoskeletal disorders primarily affects the soft tissue. The common three types of soft tissue injuries are muscle, tendon and nerve injury. During a muscle contraction, lactic acid releases by the blood. Thus, the muscle contraction which lasts for longer time subsequently reduces the blood flow in the muscle. These cause the substances which produces by the muscle to be accumulate in the muscle and not flow to the other part of the body. The accumulation of this substance irritates the muscle and causes muscle pain. The severity of the pain depends on the duration of muscle contraction and the time taken by the muscle to overcome those substances [3]. Furthermore, tendon is a flexible but inelastic cord of strong fibrous collagen tissue attaching muscle to bone. It is further classified into tendon with sheaths which found in hand and wrist and tendon without sheaths which found in shoulder, elbow and forearms. The sheaths contain cells that produce a fluid which act as a lubrication between the tendon and muscle. The excessive and repetitive movement of the tendon prevents lubrication system to function in normal manner. It may not produce enough fluid for the

lubrication. This results in friction between tendon and sheath and end up in inflammation and swelling. Recurrent inflammation causes fibrous tissue to form which thickens the sheath and prevents the tendon movements [3]. Meanwhile, tendons without sheaths are more prone to get exposed to repetitive motions and awkward postures. A tendon which get tensed repeatedly for prolong time will thickened and inflamed. Tendonitis is a term used to denote inflammation of the tendon. Besides that, in some cases such as shoulder, the tendon passes through a narrow space between the bones. Bursa is a sac located between tendons and bones and it's filled with fluid which acts as a medium for lubrication. When the tendons tend to thicken continuously, it results in friction and bursitis. Bursitis is a term denotes inflammation of the bursa [3]. In addition, nerve is a bundle of fibres which responsible for transmit sensory and motor information from one body part to another. Moreover, it also transmits the information about pain, touch and temperature and control bodily function such as a sweating. The nerves are surrounded by tendon, ligaments and muscles and it is usually swollen and compressed during repetitive motions and awkward postures. This compression causes a person to get muscle weakness and also numbness [3]. Comparatively, all the workers require the use of the arms, hands, legs, hips, ankles and feet. They tend to get pain which results from repetitive activities. Therefore, most of the workers prone to develop work related musculoskeletal disorders.

Methods and Procedures

Study design

A cross-sectional study was carried out during the period of August 2015 to November 2015 in Selangor state, Malaysia.

Study location

Study location was focused to the non-healthcare working population. Few schools and companies have been selected in Selangor. Anshin Stell Processor Sdn Bhd, Pumpen Engineering Sdn Bhd, Trendmasters Sdn Bhd, SJK (T) Sungai Renggam, Hyundai Sime Darby Motor Sdn Bhd, Sime Darby Research Sdn Bhd (Carey Island, R&D Centre Upstream), JMI Simavis Engineering Sdn Bhd, Tamicobell, Shah Alam, SMK Methodist Telok Datok,Banting, SJK(T) Pulau Carey Selatan, SJK(T) RRI Sg Buloh, Sudong Sdn Bhd.

Sampling

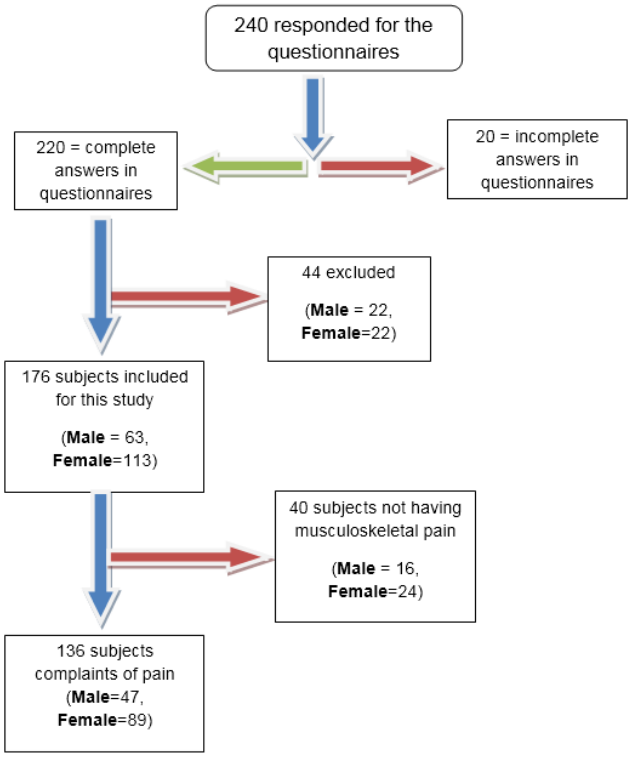
Convenient sampling technique

Three hundred non-healthcare workers were selected from different companies, offices and schools. Participants were selected using simple convenient sampling techniques. A small introduction about WMSDs and survey study was conducted before giving the questionnaires. The questionnaires given and has been collected on same day to ensure the confidentiality. The inclusion criteria for this study are male and female non-healthcare workers, age between 16-60, working for at least 7 hours per day and should have working experience for at least 1 year. The exclusion criteria for this study are recent injury or fracture, recent fall or accidents, recent surgery and pain due to musculoskeletal problems like joint arthritis, fracture and degenerative diseases.

Data collection

The survey was conducted among non-healthcare workers in Selangor. Subjects who are willing to participate in this study were explained about the study. A self administered questionnaire together with consent form was distributed to each of them at their working place with permission from higher authority of respective places.

Study methodology



300 questionnaires were distributed to 6 offices, 3 companies and 4 schools with permission from higher authority. 240 subjects responded and 60 subjects were not responded for the questionnaire because the permission not granted by higher authority. The standardized Nordic Questionnaire (SNQ) was used for this study. The SNQ consists of three sections: General information, musculoskeletal discomfort form and pain related questions. Twenty four questions were abstracted from SNQ to form my Questionnaire. The questions are answered by marking 'YES' or 'NO' on the boxes given. Two questions out of twenty four asked to mark on body chart and pain scale (Wong Baker's Face Scale). The questions are constructed in Bi-language (English and Malay) and it is reliable and easy to understand. The questions are completed within 15 minutes by the subjects. The Questionnaires was collected and analyzed. Out of 240 subjects, 220 subjects completely answered the questionnaires and 20 subjects didn't answer the questions completely. From 220 subjects, 176 subjects included and 44 subjects excluded based on inclusion and exclusion criteria.22 of them are males and 22 subjects are females. 32% of subjects excluded because having other health problems, 22% of subjects having diabetes, 18% of subjects working less than 7 hour and 14% of subjects done recent surgery and having recent injury. From the 176 subjects (male=63, female=113), who have been included in this study, 136 subjects complaints of musculoskeletal pain (male=47, female=89) and 40 subjects does not have any musculoskeletal pain (male=16, female=24).

Statistical tool

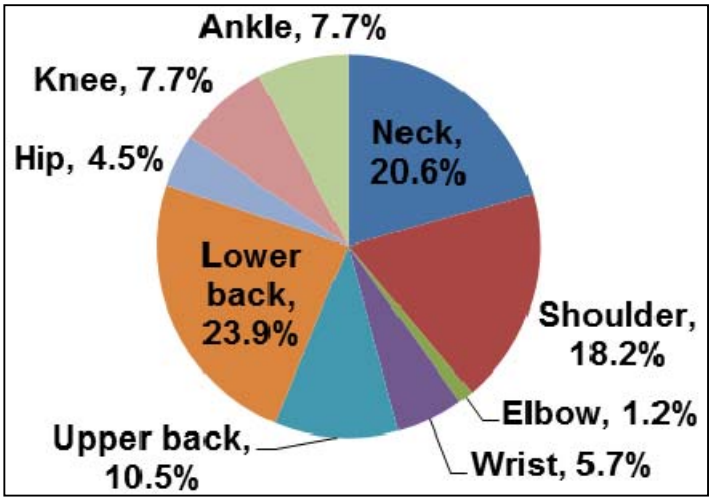
Descriptive statistics of frequency and percentage were used to analyze and interpret the results.

Data analysis

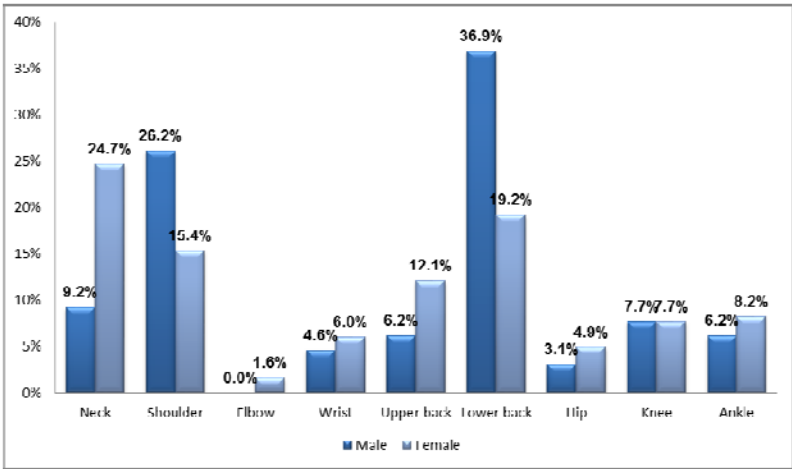
The data was analysed, as three section namely, demographic data of the participants, musculoskeletal problems and most painful body part. The data was tabulated to shows frequency distribution.

Musculoskeletal problems

PARTS	MALE *N/T (%)	FEMALE *N/T (%)	TOTAL *N/T (%)
Neck	6 (9.2)	45 (24.7)	51 (21.6)
Shoulder	17 (26.2)	28 (15.4)	45 (18.2)
Elbow	0 (0)	3 (1.6)	3 (1.2)
Wrist	3 (4.6)	11 (6.0)	14 (5.7)
Upper back	4 (6.2)	22 (12.1)	26 (10.5)
Lower back	24 (36.6)	35 (19.2)	59 (23.9)
Hip	2 (3.1)	9 (4.9)	11 (4.5)
Nee	5 (7.7)	14 (7.7)	19 (7.7)
Ankle	4 (6.2)	15 (8.2)	19 (7.7)



The table above shows the number of subjects having pain in 9 different parts of the body. The figure 13 above clearly illustrates percentage of subjects having pain in different parts of the body. Most of the subjects having lower back pain (23.9%) and followed by neck (20.6%) and shoulder (18.2%). Besides that, 10.5% of subjects having upper back pain, 7.7% having knee and ankle pain, 4.5% having hip pain, 5.7% having wrist pain and 1.2% only having elbow pain.



Discussions

This study has shown, work related musculoskeletal disorders are common in non-healthcare working population. The prevalence of work related musculoskeletal disorders are significantly high among female than male workers (78.8%). This result are consistent with literature on WRMD among healthcare professional but unfortunately, no studies specifically looking at non-healthcare population were found for comparison. The gender differences of WMDs found in this study is similar to the result of most studies. Many studies reported female predominance in the prevalence of working population. Sandul Yasobant *et al* found that female healthcare professionals have 1.9 times higher risk for developing MSDs than male health professionals[22]. As additional, Seyedtaghi Mirmohammadi *et al*. also reported that female staffs are more tendency to involve in occurrence of WMDs compare to male

staffs [10]. The prevalence of musculoskeletal disorders said to be high among females due to exposure to physical household work, but this may be offset by men's exposure to other physically demanding activities outside the workplace [23]. Further more, WRMDs are significantly high in younger age group (25-34 and 35-44) (41.2%). Stanley M Maduagwu *et al.* stated that the age range of 20-29 years had the highest prevalence of WRMDs (87.12%) while those in the oldest age group (40 years and above) had the least (37.50%). The high prevalence of WRMDs among the participants in the lowest age groups might be as a result of poor professional experience, knowledge and skills. Increased workload among this group could be another factor [8]. The high prevalence of WRMDs found among the people who working more than 8 hours (55.1%) and with working experience of 20 years and above (23.5%). Similar result was found on the study done by Beibei Feng *et al.* They stated that daily working hours associated with the presence of pain. Long working hours is considered to be correlated with job demand, which means that workers have to maintain static and/or awkward postures for prolong periods contributing to musculoskeletal overload and pain. It also suggested that a tight work schedule has been shown to lead an elevated risk of developing WRMDs. Working for more than 2 hours without a break has been strongly associated with musculoskeletal symptoms among workers [24]. Besides that, the findings of higher lower back WRMD prevalence (23.9%) are consistent with few other studies. Gbiri *et al.* concluded that low back pain was the most prevalent WRMD among workers [14]. Apart from that, Deepak B. Anap also found that low back pain the most prevalent MSD [12]. The facts of low back pain problems occurred most frequently among the participants could be attributed to their work postures, as most of them either being in awkward postures or working with their back bent for longer time [14]. Since most of the subjects complaint of moderate pain which is bearable pain, the percentage of doesn't seek for medical advice are high compare to the persons took leave due to pain trouble (50.7%). The frequency of pain common in 1-7 days (53.7%) and female are higher prevalent who complaints more frequent pain and this might be due to house hold activities. It was observed that there was high frequency of carrying out similar task. Sitting position is one of the most repetitive activities that done by the people during working hours (36.8%) and it also said to be the activity that aggravates the pain (19.9%). Prolong sitting position, particularly with poor workstations ergonomics, may cause prolonged static contraction of muscles, increased pressure on the intervertebral discs and tension on ligaments and muscles ; decreased tissue flexibility; altered spinal curvature and weakened paravertebral muscles, and such changes may lead to, or increase rick of WRMDs [23]. This might me be the reason for most of the subjects felt pain at lower back. Moreover, this study found that, the person who doesn't seek for medical advices is probably high (67.6%). It may be due to they can't afford medical expenses. The rest of subjects mostly went to clinic for the treatment and most of them doesn't have any changes in pain because they may not continue the medication and ignore the medical advices [1].

Conclusion

From the outcome of this study, it was concluded that there is high prevalence of musculoskeletal disorders among non-healthcare working population. Musculoskeletal disorders have negative impact on job performance, leisure activities and family roles. Of concern is the tendency of workers to continue to work while in pain or with a work-related musculoskeletal injury or disorder, even while exacerbating their condition.

Limitations of study

The limitation of this study is sample size. The sample size used for this study is 300. Previous study done by Baba Md. Deros used 525 as their sample size [15]. Comparatively the sample size in this study is too small. This causes the percentage of male respondents to be less compared to female and this might affects the results of this study. In addition, this survey did not include many questions about risk factors or coping strategies and psychosocial factors that may contribute to WRMDS and therefore this information not included in the analyses. Moreover, some of the participants had problems in understanding the questions have been asked in questionnaire. This causes the some participants to fail upon the completion of the questionnaire. This leads the participants to be excluded from this study.

Research recommendations

Few important recommendations for future research on work and health can be deduced from the results of the current study. Work related musculoskeletal disorders are common in working population, but this topic has not received adequate attention. Future researchers are recommended to do this study in large sample size. This study also can be done as compare WRMDs among healthcare and non-health care working population or even in a general working population. In addition, research that investigates the relationship of WRMDs on the workers productivity also much recommended. Nevertheless, research into the exposure that places the workers at risk is necessary to prevent injury.

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