

ORIGINAL ARTICLE

Musculoskeletal Symptoms among Mechanics at Tyre Service Centre: A Review

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Abstract: Musculoskeletal disorders (MSDs) are a common and developing occupational health problem in the workplace around the world, resulting in a significant cost and a negative impact on quality of life. The causes of work-related MSDs are usually multifactorial including physical, ergonomic and psychosocial factors. Musculoskeletal disorders (MSD) have been identified as a significant issue for all professions specifically mechanics. This review provides a detailed examination and discussion regarding the symptoms of the musculoskeletal that occurred among mechanics in a tyre service centre. All research studies or literature reviews, which have reported on the prevalence of musculoskeletal symptoms and/or potential risk factors for this problem in mechanics, were selected for inclusion. Many risk factors have been identified, including static and awkward posture and work practices. Overall, it is evident from the literature that MSD is a complex and multifactorial problem. Furthermore, other related industry studies have been reviewed as applicable. More research in the form of larger studies is urgently needed to help to clarify more clearly the development of this important issue the mechanics.

Keywords: Musculoskeletal disorders, mechanic

1.0 INTRODUCTION

As a developing country, Malaysia faced rapid industrial growth in various sectors such manufacturing and services sector [1]. Musculoskeletal disorders (MSDs) are widespread and increasing occupational health problems in the workplace worldwide [2]. The causes of work-related MSDs are usually multifactorial including physical, ergonomic and psychosocial factor [3]. MSDs usually occur in workers who have excessive repetition, awkward postures and heavy lifting [4]. Musculoskeletal pains (MSP) constitute a major problem in both developed and developing countries [5]. Punnet and Wegman (2004) stated that MSDs involve a variety of injury and degenerative condition that affects muscle, ligament, joint, peripheral nerve and blood vessels support. Parts of the human body that are often exposed to musculoskeletal disorders are the back, neck, arms and hands [6].

Musculoskeletal disorders (MSDs), affecting muscles and joints, are one of the top causes of workplace absenteeism and early retirement due to workers' incapacity to carry out normal daily work risks. Therefore, this issue not only affects the health of workers but also creates a burden on the health system, on the business economy and on the social costs to deal with their consequences [7]. Among industrial workers, mechanics are at greater risk for MSP due to the excessive levels of physical and biomechanical stresses both which are of static and dynamic type during their routine job activities [5]. Ergonomics focuses on how work affects people in their working environment developing solutions, with the aim of improving productivity, reducing discomfort and minimizing the hazards of work. Although ergonomic interventions are likely to reduce the risk of mechanics in developing MSD, the evidence is unclear.

2.0 MATERIAL AND METHODS

2.1 SEARCH STRATEGY

A systematic search of Science Direct (2000 to 2020), Medline (2000 to 2020), SAGE (2000 to 2020), and Google Scholar (2000 to 2020) on terms of musculoskeletal symptoms, low back pain, back pain, musculoskeletal disorder, shoulder, shoulder joint, pain, cross-sectional, case-control, determinant, predictor, and risk factor are used. All identified relevant papers as references were carefully examined for additional.

2.2 INCLUSION CRITERIA

Studies were included in the review if the following conditions were met: (a) the study was a cross sectional, case-control, or prospective cohort study; (b) the paper was a full report published in English in a peer reviewed journal; (c) information was presented on physical load or psychosocial risk factors at work; (d) exposures were assessed with standardised observational methods or standardised interviews or questionnaires; (e) musculoskeletal symptoms were self-reported or confirmed by physical exam ignition; (f) in studies on combined these pain and upper limb pain or other pain symptoms were presented separately. Studies on acute injuries caused by trauma or sports injuries, and studies that evaluated exposure based solely on work names, letters, and abstracts were all excluded.

2.3 METHODOLOGICAL QUALITY ASSESSMENT

All the articles were chosen based on six criteria: (1) positive when an illness or sickness was described and explained in detail; (2) details of the places of the service centre; (3) detail of the mechanics; (4) details of instruments; (5) classification of statistics; (6) positive when the response rate was at least 50%. If there are limitations across studies because of the inconsistency of relative treatment effects, indirectness, imprecision, or other factors, the credibility of the finding is reduced.

3.0 RESULTS

3.1 STUDY SELECTION

A total of 161 papers were retrieved from the following database of this research. Sixty-three studies were identified and removed. In addition, 27 studies were excluded because full-texts were not available. Studies that were inappropriate for the purpose of the study, reviews and non-English papers were also excluded. Consequently, 211 papers were screened and 26 were included in the review for final evaluation.

3.2 PREVALENCE OF MUSCULOSKELETAL SYMPTOMS

3.2.1 LOW BACK PAIN

Low back pain is a typical health problem in worldwide and a major cause of disability that affects performance at work and general well-being. Low back pain is a major cause of disability, socioeconomic problems and loss of quality of life in developed countries but its consequences have rarely been studied in other regions [12]. Known risk factors include rapid pace of work and repetitive motion, insufficient recovery time, vibration, physical loading involving heavy lifting, bending and twisting, and sustained non-neutral posture. Any of these risk factors in combination with each other or with negative aspects of the psychosocial work environment such as high pressure and minimal autonomy can contribute to back pain [13]. These include obesity, smoking, weight lifting, stooping, prolonged sitting, and poor fitness, especially among those with a sedentary lifestyle and awkward posture at work. The non-modifiable risk factors include the increasing age, number of children and any presence of major spinal deformities.

Low back pain affects people of all ages, from children to the elderly, and is a very frequent reason for medical consultations. Men and women are equally affected by low back pain, which can range in intensity from a dull, constant ache to a sudden, sharp sensation that leaves the person incapacitated [14]. The vast majority of low back pain is mechanical in nature. In many cases, low back pain is associated with spondylitis, a term that refers to the general degeneration of the spine associated with the normal wear and tear that occurs in the joint, discs, and bones of the spine as people get older [12]. The 2010 global burden of disease study estimated that low back pain was among the top 10 diseases and injuries that accounted for the highest number of disability adjusted life years (DALYs) worldwide[14].

3.2.2 SHOULDER PAIN

Shoulder pain is the one of most common problems related to musculoskeletal symptoms. The prevalence of shoulder pain in the general population may be as high as 6%–11% under the age of 50 years, increasing to 16%–25% in elderly people [15]. Referred pain can be defined as pain experienced at a site distant from the tissue damage. The report of shoulder pain during a myocardial infarction is a common example of referred visceral pain [16]. The number of epidemiological studies reporting on potential risk factors for shoulder pain has greatly increased in the past decade. Work related factors are assumed to play an important part in the development of shoulder pain, and many studies have been conducted in various occupational settings.

Shoulder pain shows the result of concerted action in many factors including individual, physical work load and the work environment factors [15]. Work repetition, awkward posture, twisted and bent posture, working with arms lifted to the shoulder level and carrying large weights, can all contribute to upper limb dysfunction, particularly in the shoulders [17]. A poor social work environment that come together with an inadequate personal capacity to cope with these factors, may increase work related stress. The increase in stress may increase muscle tone directly, or strengthen the relationship between physical work load and musculoskeletal symptoms. Inability to work, loss of productivity, and inability to carry out household activities can be a considerable burden to the patient as well as to society.

3.2.3 HAND/WRISTS PAIN

Forceful and repetitive hand and wrist activities, and extreme hand/wrist postures, may cause hand, wrist, and elbow musculoskeletal disorders, including tendonitis. Numerous publications based on field studies among industrial workers in manufacturing and meatpacking sector have confirmed these risks. A combination of risk factors, such as forceful and repetitive hand activities, is an even greater risk factor for musculoskeletal disorders. Sensory and motor disturbances are characteristic of musculoskeletal disorders (MSD) including those of the wrist and hand [18].

Richardson et al. (2012) stated that operators with higher job control can to have greater autonomy and therefore take more breaks, help their muscles and reduce the risk of developing musculoskeletal symptoms associated with work [19]. The table height requires the operator to flex and extend the arm repeatedly, and to flex much of the load [4] on the wrist bearing. Using a force on an individual or object can overload our muscles and tendons [20].

4.0 DISCUSSION

Exposure to extended periods of occupational standing is traditionally common among specific occupational groups, such as in the retail, food, healthcare, education and manufacturing industries [21]. In many types of occupational groups, MSDs are major causes of work related disability and lost time due to illness [22]. The term musculoskeletal disorders (MSDs) refer to conditions that involve the nerves, tendons, muscles and supporting structure of the human body [22] [23] [24]. Ranging from back strains to carpal tunnel syndrome, it is common for workers to find MSD accounting for 40% or more of their injury cases and 60% of their compensation costs. Worker who are performing heavy physical work have a significantly higher prevalence of MSDs in different regions of the body [22]. Work-related musculoskeletal disorders (WMSDs) are potentially disabling the conditions affecting workers. While WMSDs affect all sectors of the working population, mechanics have especially high MSD rates. However, all mechanics perform manual material handling and are exposed to physical risk factors associated with WMSDs [25]. Risk factors associated with the disorders include manual handling of loads, particularly with heavier larger or unwieldy loads, increased frequency or duration of manual handling activities, repetitive movements, and sustaining extreme or awkward postures such as

bending, reaching or twisting [26]. The incidence of WMSDs among any worker population can be estimated from the workers' compensation claim. A higher incidence or prevalence among an occupational group suggests that these workers have greater exposure to physical risk factors in the workplace.

5.0 CONCLUSION

Musculoskeletal issues appeared to be prevalent. To summarise, there was a high prevalence of musculoskeletal symptoms among mechanics with a high extent of indications in the lower back, shoulders, knees, and neck. Furthermore, from the point of view of the type of activity, the prevalence rates of MSDs in all body regions were higher among mechanics with dynamic jobs as compared to those of workers with static jobs. In order for mechanics in the service sector to handle their work efficiently, further studies should focus on appropriate working positions.

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