

Research Article

Relationship Between Work Experience and Risk of Neuropathic Pain Among Loading--Unloading Workers

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Abstract.

Lifting and transporting activities are the most common tasks in the logistics sector, especially for loading-unloading workers. The workers continuously lift heavy loads, which leads to pain in the waist, back, arms, and legs. Neuropathic pain is a type of pain caused by peripheral nerve lesions. The aim of this study was to find the relationship between the different levels of work experience and the risk of neuropathic pain among loading-unloading workers. We used descriptive analytics as the method of the study. 65 healthy men aged 20-55 years, without health issues or diabetes mellitus, and active loading-unloading workers were recruited as study respondents. They were divided into three groups based on their different levels of work experience. We utilized the Leeds assessment of neuropathic symptoms and signs (LANSS) questionnaire to check whether the participant was at risk for neuropathic pain. Our results showed that 43% of participants identified as having less, 28% as middle, and 29% as having more work experience. Furthermore, work experience is significantly correlated to the risk of neuropathic pain ($P < 0.000$). We concluded that the more experienced loading workers are, the more likely they are to experience neuropathic pain.

Keywords: work experience, peripheral-neuropathy, pain, loading workers

1. Introduction

Loading and unloading activities have become daily activities for humans, it is frequently seen in plantations, mining, markets, ports, government offices, the catering industry, and shipping services [1][2]. The continuous heavy loads can cause pain in the back, waist, wrist, arm, leg, and much more [3]. Pain and any other appearing symptoms are pulled due to incorrect position and workplace were not in accordance with human anatomy and physiology [4]. Since lifting and transporting are the most common activities involved in every job [5]. Continuous lifting and carrying for long periods not only cause local pain, yet radial pain which is categorized as nerve damage may occur [6].

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Repeatedly and inappropriately movements that are performed by loading and unloading workers may lead to neuropathic pain [7]. The disease of the somatosensory system such as deficit or lesion causing pain is defined as neuropathic pain [8]. In America, more than 20 million people are estimated to become neuropathic pain survivors [9]. Yet, there was no specific prevalence of neuropathic pain. Recently, one study about probable neuropathic pain in the USA utilized the PainDetect questionnaire and reported pain among 63.7% of all respondents. Further investigation showed that 15.7% of respondents had probable neuropathic pain. The highest result was identified in males (35-44 y.o. and 45-54 y.o.) [10].

Previous studies found that neuropathic pain comes along with specific diseases, such as diabetic peripheral neuropathy (DPN) [11]–[15]. Whether they come as compensation or not, they have the same clinical findings, for instance, pain, hyperalgesia, allodynia, and hypersensitivity [16]. The classification of neuropathic pain is categorized into several conditions. Based on the distribution and location it is characterized by central or peripheral, while etiology plays an important role in identifying the cause [17]. Referring to the target in this present study loading-unloading workers, besides strength, experience is also needed. To support the deft level among workers and to meet the effectiveness of work goals, experience can be the key. From our preliminary findings, the majority of workers in this field are workers with long tenure and older. Nonetheless, working with repetitive loading for a long time period, especially in the elderly, will increase the incidence of neuropathic pain [18], [19].

Lately, the common approaches to treating neuropathic pain are still unmet in their efficacy [8]. Since the disorder as compensation for neuropathic pain is in accordance with decreased quality of life and socioeconomic burden [20]. The previous study conducted on 40 route drivers as participants found that there was a significant correlation between the working period with peripheral neuropathy [9]. However, the latest studies focused on finding the prevalence in communities or specific populations. Despite obtaining the incidence rate, it may result in an appropriate treatment to support a sufficient outcome. The objective of this present study is to detect the percentage of neuropathic pain and to assess the correlation between work experience and with risk of neuropathic pain among loading-unloading workers.

2. Materials and methods

2.1. Characteristic of participants

In this present study, a total of 65 men aged 20-55 y.o participated with the criteria as follows; communicative; no health issues; no history of high blood glucose; actively working as loading-unloading workers in the past year; and willing to participate in this study. All of the participants were explained the study process and were given an informed consent sheet once they agreed to participate.

2.2. Study Process

We utilized Leeds's assessment of neuropathic symptoms and signs (LANSS) to assess whether the pain is present or absent among loading-unloading workers. LANSS provided a pain scale to inform the clinical condition and distinguish pain sensations categorized as nociceptive or neuropathic [21]. LANSS has a high sensitivity (83%) and specificity (87%). Further, 85% of LANSS's result supports the diagnosis of neuropathic pain clinically.

LANSS consists of 7 points with 5 items representing sensory description and 2 items representing sensory dysfunction examination. 24 is a result of the total score if the score is less than 12, it means the neuropathic mechanism doesn't play a role in perceiving pain, while more than 12, is the perceived pain caused by the neuropathic mechanism. Due to its highly sensitive and specific, LANSS can be delivered to participants by direct interview, or phone call.

2.3. Statistical Analysis

All statistical analyses used SPSS (software version: 24.0; doc number: 724325, New York, US). Pearson's rho coefficients were used to analyze the relationship between work experience with risk of neuropathic pain among loading-unloading workers. A two-tailed correlation significance was set at 0.05 levels ($p < 0.05$).

3. Results

Table 1 showed the demographic of participants' characteristics where a high percentage of age held at a young age among the working-age population. In the field of loading and unloading, the number of middle and elder age population workers is decreasing. Another data revealed that the working period among participants in our

study that had a longer working experience (>10 years, n = 11) was still found. However, we found the dominating result of working experience of fewer than 10 years (n = 54).

From the LANSS assessment, we found that loading-unloading workers in this present study have a higher risk of neuropathic pain. A total of 54% of total participants had positive test results.

TABLE 1: Demographic Data.

Demographic Characteristic		%	Mean	Min	Max
Sex	Male	100	-	-	-
	Female	0	-	-	-
Age	Years				
	20-25	19			
	26-30	22			
	31-35	15			
	36-40	14			
	41-45	12			
	46-50	9			
	51-55	9			
Working Period	Years				
	<6	43			
	6-10	28			
	>10	29			
Risk of neuropathic pain	Yes	54			
	No	46			

Table 2 showed the result of relationship analysis by Pearson’s rho coefficient where work experience significantly correlated to the risk of neuropathic pain (P < 0.000; r = 0.563).

TABLE 2: Pearson’s analysis.

Variable	Result
Work experience and risk of neuropathic pain	r = 0.563
	p = 0.000

4. Discussion

The prevalence of neuropathic pain is commonly perceived among women compared to men [22]. High pain perception among women happened due to intolerant sensations they received. Others, in accordance with estrogen levels among women, cause a decrease in B-endorphin and reduced pain inhibition. These findings supported the

thought that pain perceived among genders can be influenced by hormonal and psychological factors. Estrogen and progesterone in women affect the process of nerve sensitization and cause pain threshold decreases [23].

The previous study revealed that the risk of median nerve injury as a cause of carpal tunnel syndrome is highly found among female workers. The anatomical reason may influence that result, women have narrower carpal tunnels than men [24]. However, our finding showed that among loading-unloading workers, the percentage of neuropathic pain risk were highly revealed in men. The main reason is due to the fact that the majority of workers in this field are men. In addition, the work carried out involves great strength, endurance, and energy so that it is more likely to be done by men.

Based on the age characteristics in this study, most of them were 26-30 years old with a total of 14 workers. As a person ages, the ability to tolerate pain will decrease [25], many elderly complain of neuropathic pain [19]. Based on the results of hypothesis testing that have been carried out, it showed that there was a significant relationship between age and the incidence of neuropathic pain with a higher prevalence of neuropathic pain in the 55-64 year age group [18]. In the elderly there is a change in pain threshold and a change in A α nerve fibers which have a role to convey epicritic transmission, localized pain, the stimulus response from the brain will also slow down. This change which ultimately makes it difficult for the elderly to explain where the pain is and difficult to explain what they perceived [25]

Based on the characteristics obtained from the length of work experiences for the loading and unloading of grocery goods, it was found that the new service period was 28 people, the medium service period was 18 people, and the old service period was 19 people. The longer the working period, the greater the risk of neuropathic pain [26]. In loading and unloading workers, many repetitive movements such as flexion or extension, supination or pronation, ulnar deviation and radial deviation, movements that are carried out repeatedly and continuously can cause neuropathic pain [7].

This study was conducted to examine the relationship between work experience and the risk of neuropathic pain in superior extremities among loading-unloading workers of grocery suppliers. The results showed that the length of service had a relationship with the risk of neuropathic pain in loading and unloading grocery suppliers, it was known that the longer the working period of a worker, the higher the risk of neuropathic pain.

The incidence of neuropathic pain will increase with the age of a person and also the length of work. As has been done in previous studies stating that older age had a greater risk of experiencing neuropathic pain [24]. The previous study [9] concluded

that working years > 12 years had a greater risk of experiencing neuropathic pain than working years < 12 years.

The longer the work period, the more repetitive movements will be carried out and may increase the risk of neuropathic pain. In this study, the working period of loading and unloading workers for grocery suppliers ranged from 1 to 23 years. Some of the risk factors for neuropathic pain in workers are repetitive movements that have excessive pressure, poor work posture, and others [27]. Daily repeated movements increase the risk of tendinitis resulting in compression of the nerves [24]. Poor work posture also triggers neuropathic pain due to inflammation of the nerves and muscles. The nerves will be depressed resulting in neuropathic pain [24]. The working period is also one of the factors that cause a person to experience neuropathic pain, the longer the working period, the greater the risk of experiencing neuropathic pain.

Based on the previous study, it is known that the risk of neuropathic pain occurrence is mostly experienced by workers loading and unloading grocery goods suppliers who work for 1 to 23 years. The results of statistical tests showed that there was a significant relationship between increasing years of work and neuropathic pain. Research conducted by Syahputra et al (2013) noticed that there was a significant relationship between working years > 12 years with a higher risk of developing neuropathic pain than working years < 12 years [9]. Likewise, research conducted by Nafasa et al (2019) found that working years > 4 years were more at risk of developing neuropathic pain than working years < 4 years [26].

5. Conclusion

From this present study, we found that 54% of workers from the total participants we assessed have a risk of neuropathic pain. Further, there was a significant correlation between work experience and risk of neuropathic pain among loading-unloading workers. The longer work experience has a high risk of neuropathic pain. In addition, from our participants, older workers with longer experience are quietly high in total. However, further study is needed to assess the correlation between work experience and loading-unloading workers in larger sample sizes, and also to find the best approach to treating neuropathic pain that occurred among workers.

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