Prevalence of occupational low back pain among drivers of terminal tractors in the port of Mombasa, Kenya

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ABSTRACT

Low Back Pain (LBP) is pain limited to the lumbar spine. It is very common across all types of industries and professional drivers have been found to be at higher risk for developing LBP. However, statistics on LBP in Kenya is scant. The terminal tractor drivers in the port of Mombasa had raised complaints believed to be related to their job and the number of drivers who have had back surgeries due to LBP had been increasing. This study was carried out to establish the magnitude of this disorder among the drivers by determining the point, 12-months and lifetime prevalence of LBP. A descriptive research design in the form of cross-sectional survey was used with structured questionnaire as the main instrument for data collection. The point prevalence of LBP was 90% while the 12-months and the lifetime prevalence were found to be 95.5% and 98% respectively. The prevalence of LBP decreased with age and work experience and generally increased with increase in weight. 66% reported that the number of years worked as terminal tractor driver was equal to the number of years they had been having LBP, an indication of job related risk factors as the cause of LBP. The study concludes that LBP is highly prevalent among tractor drivers in the port of Mombasa regardless of age group, weight category and work experience. Health and safety training, proper maintenance of the tractors and medical examination are some of the intervention strategies recommended to reduce the prevalence of LBP.

Key words: Prevalence, low back pain, terminal tractor drivers, port of Mombasa.

Introduction

Lower back which is also known as the lumbar spine is one of the four major sections of the spine. It is a combination of strong bones, flexible ligaments and tendons, large muscles and highly sensitive nerves. The spine is designed to be incredibly strong, protecting the highly sensitive nerve roots, yet highly flexible, providing for mobility on many different planes (Ullrich, 2009). It is the lumbar spine that supports most of the body weight and therefore more likely to be associated with back problems. According to European Agency for Safety and Health at Work (EASHW 2000), occupational LBP is any back pain originating in the context of work and considered clinically to have been probably caused, at least in part, or exacerbated by the worker’s job. Low back pain is highly prevalent across all occupations and professional drivers have been found to be at higher risk for developing LBP due to prolonged sitting and whole body vibration (Chen et al., 2005). Studies on the prevalence of LBP have been carried out extensively especially in the developed world. LBP is the most prevalent musculoskeletal condition, a major health problem and the most common cause of disability in developed nations (Woolf and Pfleger, 2003). The lifetime prevalence of LBP (at least one episode of LBP in a lifetime) in the developed countries was reported to be up to 85% (Walker, 2000). In a study of the general population in the Netherlands, the prevalence of LBP was found to be 46% for men and 52% for women (Hoogendoorn et al., 1999). In Switzerland LBP was found to be most prevalent health problem and a leading cause of reduced work performance and disability with a prevalence of 47% for women and 39% for men (Wieser et
Malaysia a cross sectional study involving 760 drivers revealed a high prevalence of LBP (60.4% among commercial drivers (Abdullah al., 2008). Bovenzi (1996) reported a high prevalence rate of LBP among urban bus drivers (83.8%) in the developed countries. In Brazil a study of the prevalence and risk factors for LBP in 410 truck drivers indicated that 242 (59%) had LBP, while 168 (41%) did not have LBP (Andrusaitis al., et al., 2006). Deborah et al., (2010) assessed the prevalence of LBP among Israeli professional urban bus driver and found a 45% prevalence of LBP among Israeli professional bus drivers. This finding was comparable with a report by Robert and Mansfield (2007) who found a 60% prevalence of LBP among professional truck drivers over 12 months. Magnusson et al., (1996) studied a group of Swedish bus drivers and found 60% prevalence of LBP.

In the developing world including Africa studies on musculoskeletal disorders and LBP started much later and the data available is not as extensive as the data available for the developed countries. According to Galukande et al., (2005) not much is known about LBP in the developing countries since the data is scant. In Kenya Muruka (1997) found that 64% of the tea pickers were suffering from back pain. Of these people, 29% had a history of back pain before they started picking tea. Mbaye et al., (2002) reported a prevalence of LBP at 54% among drivers of a public transportation company in Senegal. The prevalence of LBP was studied and compared in Nigeria among commercial motor drivers and private automobile drivers. The results showed that low back pain was experienced more among the commercial motor drivers (Odebiiy et al., 2007). The 12-month prevalence of LBP in the commercial motor drivers and private automobile drivers were 96% and 88% respectively.

The Port industry in Kenya has been growing rapidly in the last few years. During the research period the Kenya Ports Authority was constructing an extra berth and a second container terminal which was expected to handle much more cargo than the existing container terminal. These expansions and the construction of a bigger port in Lamu will certainly increase the number of container handling equipment including terminal tractors as well as the number of drivers. This increase in the number of machines and drivers may possibly lead to an increase in the prevalence of LBP with enormous cost to the port of Mombasa in terms of productivity losses. The port is a critical industry in the development of the country's economy and there is need to enhance productivity in this sector of the economy. The existence of LBP among the drivers of the terminal tractor would seriously affect their health, performance and productivity of the port. The purpose of this study therefore was to determine the magnitude of this disorder among the drivers of terminal tractors in the Port of Mombasa.

Methodology

Study area/ Population

This study was conducted in the port of Mombasa. The study population (tractor drivers) was drawn from the department of container operations and in particular the mobile plant section. There were 200 terminal tractors drivers in the port of Mombasa and about 80 terminal tractors. The terminal tractors were further categorized in to five different types depending on the make and manufacturer.

Sampling technique

The sampling techniques used for this study were mostly non-probability sampling including purposive, snowballing and convenience sampling to obtain a representative sample for the study population. Probability sampling in the form of systematic sampling was also used to select some of the samples for the study.

Sample size

To obtain the sample size, three different methods were used. The table for determining minimum returned sample size for continuous and categorical data by Bartlett et al., (2001), the Cochran (1977) correction formula and Mugenda and Mugenda (2003) were used to calculate the sample size. The calculated sample size using these formula was 132 drivers. This was increased to 150 drivers because of the use of non-probability sampling technique and to reduce the sampling error. Collection of primary data was done using a structured questionnaire, observations and interviews. A questionnaire consistent with the objectives of the study was administered for most respondents by the researcher while some were distributed to the respondents under the close supervision of the researcher. To establish the prevalence of low back pain, primary data generated from the drivers using the questionnaire was used.

Data analysis

Data collected was analyzed based on the objective of the study. The variables that were analyzed were age, job experience and weight. The relationships and the strength of relationships between each of these variables and low back pain were established using bivariate
correlation analysis. The significance and the strength of associations between the variables were obtained using Spearman’s correlation coefficients generated from SPSS.

Results and Discussion

Response rate

Findings on the response rate indicate that 133 drivers took part in the study, out of the expected 150 drivers. This represents 88.67% response rate.

Age distribution among the drivers

The age brackets of the drivers was categorized in age groups at an interval of 10 years and based on the current national retirement age of 60 years. The result is summarized in table 1.

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30 years</td>
<td>18</td>
<td>13.5</td>
</tr>
<tr>
<td>31-40 years</td>
<td>59</td>
<td>44.4</td>
</tr>
<tr>
<td>41-50 years</td>
<td>50</td>
<td>37.6</td>
</tr>
<tr>
<td>51-60 years</td>
<td>6</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>133</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

From the table it is evident that majority of terminal tractor drivers (82%) in the Port of Mombasa were aged between 31 and 50 years. Most of these drivers passed through other departments and spent some years before transfer to the terminal tractor section. The low percentage of the age group 51-60 years could be attributed to the fact that a number of the drivers in this category might have retired at the age of 55 before the retirement age was increased to 60 years. There is also a possibility that they had been moved to operate bigger machines like cranes because of their experience.

Weight distribution among the drivers

The study established the weight brackets of the terminal tractor drivers categorized in weight groups mostly at an interval of 10 kilograms. These findings are summarized in figure 1.

![Figure 1 weight of the drivers of terminal tractors](image)

This result is an indication that while a few of the drivers had extreme weights, most of the drivers had an average weight of 61-80kgs. The weight of the respondents was critical in determining whether the drivers were more likely to suffer from low back pain due to the stress and pressure exerted on the bones of the vertebral column that support the body weight.

Work experience of the drivers

The study established the experience of the drivers in terms of the number of the years they had worked as terminal tractor drivers. Table 2 summarizes these findings.

<table>
<thead>
<tr>
<th>Work experience</th>
<th>Frequency (n)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>31</td>
<td>23.3%</td>
</tr>
<tr>
<td>4-6</td>
<td>37</td>
<td>27.8%</td>
</tr>
<tr>
<td>7-9</td>
<td>29</td>
<td>21.8%</td>
</tr>
<tr>
<td>10 years and above</td>
<td>36</td>
<td>27.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>133</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

The experience of the drivers ranged from 1 to 3 years to over 10 years with 23.3% of the drivers working 1-3 years and 27.1% having worked over 10 years as terminal tractor drivers. This statistics show that the different experience categories were almost evenly distributed among the drivers in the sample used for the study.
Prevalence of Low Back Pain

The study sought to establish those who had low back pain during the research (Point Prevalence), those who had experienced low back pain in the previous year (annual or 12-month prevalence) and those who had experienced at least one episode of low back pain in their lifetime (Lifetime prevalence). The findings are shown in figure 2.

Figure 2: General prevalence of LBP among the terminal tractor drivers

In addition, the drivers were asked whether they were aware of other drivers who were suffering from LBP and were further asked to estimate the number. On average, every respondent was aware of at least 106 (79.7%) other drivers with LBP.

The findings of this survey have established a high Point prevalence of low back pain (90%) with annual and lifetime prevalence of 95.5% and 98% respectively. The results from this study further strengthens the evidence that low back pain is a common disorder and highly prevalent among professional drivers. The fact that every driver was aware of at least 106 other drivers with low back pain is an indication of the high prevalence of this disorder among the terminal tractor drivers and confirms the findings of the study.

The prevalence in the present study was generally high compared to the findings in most of the epidemiological studies reviewed. This variation in results especially the point prevalence may be attributed to many factors, including the working conditions and working procedures of the respondents in the present study, human/behavioral factors, machine/maintenance aspects and inadequate training in health and safety.

Prevalence and Age

The study sought to establish the prevalence of Low Back Pain (point prevalence) among different age groups of the respondents and the results are summarized in table 3.

Table 3 Prevalence distribution among the age groups

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency (n)</th>
<th>Prevalence of LBP (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30 years</td>
<td>18</td>
<td>94.5</td>
</tr>
<tr>
<td>31-40 years</td>
<td>59</td>
<td>91.5</td>
</tr>
<tr>
<td>41-50 years</td>
<td>50</td>
<td>88</td>
</tr>
<tr>
<td>51-60 years</td>
<td>06</td>
<td>83.3</td>
</tr>
<tr>
<td>Total</td>
<td>133</td>
<td></td>
</tr>
</tbody>
</table>

The prevalence was highest among drivers in the age group of 20-30 years and lowest among drivers in the age group of 51-60 years. This is a clear indication that the prevalence was highest among younger drivers and lowest among the older drivers. Most of the epidemiological studies reviewed reported that age was found to increase the risk of occupational musculoskeletal disorders including low back pain. The findings of this study are therefore not consistent with the findings of other studies with respect to the prevalence of low back pain among the age groups. This can be attributed to a number of factors.

The younger drivers were associated more with working more than one shift than the older drivers. The highest percentage (40%) of the drivers who had worked more than one shift were the younger drivers (20-30 years) as compared to the 33.3% for the age group 31-40 years, 23.3% for the age group 41-50 years and 3.3% for the age group 51-60 years. The results for job satisfaction in relation to age showed that the age group 20-30 years was less satisfied than the age groups 31-40 years and 41-50 years. Of the 27 drivers who were satisfied with their job as a terminal tractor only 2(7.4%) were in the age bracket 20-30 years. A significant relationship was found between low back pain and job satisfaction. The results for the seeking medical attention because of LBP in relation to age showed that 61.1% of the drivers in the age group 20-30 years sought medical examination because of low back pain as compared to 91.5% for the age groups 31-40 years, 41-50 years and 51-60 years respectively.
A nother general observation during the interviews was that the older drivers were more concerned about the effects of low back pain than the younger drivers. It was evident that they had lived with the problem for so many years and were able to understand its consequence hence more cautious than the younger drivers. Experieced and older drivers asked to comment on this finding attributed it to the driving behavior (speeding) of the younger and inexperienced drivers whom they said usually drove the tractors fast even in rough areas putting themselves at more risk of exposure to whole body vibrations. This was however not investigated further.

A bivariate correlation analysis showed that there was a very weak relationship between age and LBP for the terminal tractor drivers. There was no statistically significant difference between LBP and age (P value > 0.05). This is attributed to the fact that all the age groups generally had high prevalence of LBP. No matter the age group low back pain was highly prevalent among the drivers hence no significant difference statistically.

Prevalence and weight

The study sought to establish the prevalence of LBP among the drivers in different weight categories and the findings are as shown in figure 3.

Figure 3 Prevalence of LBP among the weight categories

<table>
<thead>
<tr>
<th>Weight Brackets</th>
<th>Prevalence Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>over 90</td>
<td>83.3</td>
</tr>
<tr>
<td>81-90</td>
<td>95.5</td>
</tr>
<tr>
<td>71-80</td>
<td>92.5</td>
</tr>
<tr>
<td>61-70</td>
<td>90.2</td>
</tr>
<tr>
<td>45-60</td>
<td>78.6</td>
</tr>
</tbody>
</table>

The result shows that the prevalence was lowest among the drivers in the weight category of 45-60kgs while the highest prevalence was recorded for the weight category of 81-90kgs. The average prevalence for all the weight categories was found to be approximately 88% This is an indication that there was a relationship between the weight of the drivers and the prevalence of LBP in the sense that the higher the weight of the driver the higher the prevalence of low back pain. However there was a slight drop in the prevalence for the weight category of over 90kgs which may be attributed to the small number of respondents in this weight category. The Pearson’s correlation analysis showed that there was no statistically significant difference between weight and low back pain. A p-value of 0.369 (> 0.05) was yielded. The average prevalence of low back pain among all the weight categories was 88%which is almost equal to the point prevalence (90%) hence the lack of statistically significant difference.

Prevalence and work experience

The prevalence of low back pain among the different categories of work experience was established and result showed that the prevalence of LBP among the drivers who had worked for 1-3 years was 93.5%. The drivers who had worked for 4-6 years as terminal tractor drivers had a prevalence of 92% while the prevalence among those with work experience of 7-9 years was 89.7%. A prevalence of 86% was recorded among the drivers with over 9 years experience as terminal tractor drivers.

Table 4 Prevalence of LBP and work experience

<table>
<thead>
<tr>
<th>Work experience</th>
<th>Frequency (n)</th>
<th>Prevalence of LBP</th>
<th>Prevalence%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>31</td>
<td>29</td>
<td>93.5</td>
</tr>
<tr>
<td>4-6</td>
<td>37</td>
<td>34</td>
<td>92</td>
</tr>
<tr>
<td>7-9</td>
<td>29</td>
<td>26</td>
<td>89.7</td>
</tr>
<tr>
<td>10 years and above</td>
<td>36</td>
<td>31</td>
<td>86</td>
</tr>
<tr>
<td>Total</td>
<td>133</td>
<td>120</td>
<td></td>
</tr>
</tbody>
</table>

The prevalence of low back was generally high among all the categories with an average prevalence of 90.3% however the highest prevalence was recorded for the category concerning work experience of 1-3 years and the lowest prevalence recorded for the category concerning work experience of over 9 years. From the table above, it is a clear that the prevalence of low back pain among the respondents decreased with increase in working experience. These findings are therefore not consistent with the findings of other epidemiological studies where LBP was found to increase with the number of years in the job.

In the present study, the less experienced drivers were associated more with working more than one shift
as compared to the experienced drivers. The highest percentage (36.7%) of those who had worked more than one shift had a work experience of 1-3 years. This may have exposed the drivers to a lot of fatigue hence more pain for those suffering from low back pain. A positive association was found between fatigue and LBP among freight container tractor drivers by other epidemiological studies.

Similarly the highest percentage (50%) of those who did not seek medical attention had a work experience of 1-3 years followed by those with work experience of 4-6 year (30%). These findings may also be attributed to the concerns and cautiousness observed among the more experienced drivers. The experienced drivers reported that it took them several years before they realized the effects LBP had on them and started treading carefully and cautiously. A cross tabulation between age and work experience showed that age was strongly correlated to the work experience of the drivers which explains the similar trends observed. The highest percentage of the respondents in the age bracket of 20-30 years had a work experience of 1-3 years.

Similarly the highest percentage of the respondents in the age bracket 51-60 years had a work experience of over 9 years. This confirms an observation made by Burdorf and Sorock (1997) where age and years of employment were found to be strongly correlated which makes it difficult to disentangle their effects on the occurrence of low back disorders. The correlation analysis showed that there was no statistically significant difference between work experience and LBP. A P-value > 0.05 was yielded. The differences in the prevalence between the different categories for work experience were minimal because the average prevalence of LBP among all the categories used for experience was 90% which was equal to the point prevalence. This might be the reason why there was no statistically significant difference.

Conclusion

The results of the prevalence of occupational LBP have shown that this disorder is highly prevalent among the drivers of terminal tractors in the port of Mombasa. The prevalence was generally high among all age groups despite the fact that the relationship between low back pain and age was not statistically significant. A similar finding was found between low back pain and the number of years worked as a tractor driver. The drivers who were in the higher weight categories were at risk of developing low back pain more than the drivers in the lower weight categories.

Acknowledgement

First and foremost my sincere thanks goes Mr. Charles Mburu for his guidance throughout this research. I thank Kenya Ports Authority for allowing me to carry out this study within the port of Mombasa. I am sincerely grateful to the drivers of terminal tractors in the port of Mombasa whose participation in the research made this study a reality. My heartfelt thanks and appreciation goes to Mohamed Dahiye, Antony Matu, Abdihameen N. Ali, Faiza M. Othman, Alex Odihambo and Nicholas Ronoh for their assistance during the data collection.

References


increased risk for developing musculoskeletal disorders?


