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Evaluation of causes and preventive measures of low back pain: A retrospective study

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Abstract
Introduction: Most epidemiological data concerning low back pain (LBP) are related to developed and industrialized countries but little information about LBP in the general population in developing and low-income countries. Back pain affects 60-80% of people at some time in their lives. Acute low back pain is one of the most common reasons for adults to visit Orthopaedist. Though most patients recover quickly with minimal intervention, proper evaluation is imperative to identify rare case of serious underlying pathology.
Aim of the study: The aim of the study is to evaluate the different causes of low back pain, occupational and risk factors, association with age and sex of the patient and their life styles.
Materials and Methods: The present study is a retrospective study of 40 patients of low back pain between the age group of 21-85 years of both sexes who were admitted and treated at Department of Orthopaedics from August 2020 to December 2020. The information was collected from the patients regarding their occupation, education, obesity, smoking, tuberculosis, diabetes, alcohol consumption, osteoporosis, osteoarthritis and any history of trauma. The clinical diagnosis of cases was done and confirmed radiologically. A proforma was prepared and the patient's age, sex, duration of symptoms, place of living and the cause for low back pain was noted. A thorough neurological examination was also performed.
Results: The author tabulated 40 patients of low back pain into four categories according to age and noted the number of cases in each group. The highest number of cases (12) is observed in the age group of 51-60 years (40%) and the lowest number of cases (2) is observed in the age group of 71-80 years (6%). All patients were inquired about (occupational, trauma, infection, diabetes mellitus, smoking, alcohol and medication history), subjected to a clinical examination and a series of investigations. In 40 cases of LBP studied, the most common cause for back pain was disc prolapse (44%). The next common causes were lumbar spondylosis, spondylolisthesis and lumbar spinal stenosis (17%, 10% & 10% respectively). The research found association between low back pain and various factors. Prevention is the key for avoiding low back pain but is realistically hard to practice because the problem of low back pain has many environmental and intrinsic risk factors.
Conclusion: Low back pain affects a large percentage of the population and is difficult to diagnose. Orthopaedist must accept the diagnostic ambiguity that often accompanies the condition. Identification of etiological and various risk factors, cause for back pain and type of occupation and instituting preventive measures, as well as rehabilitation of patients can lead to a meaningful reduction in the incidence of devitalizing back pain.

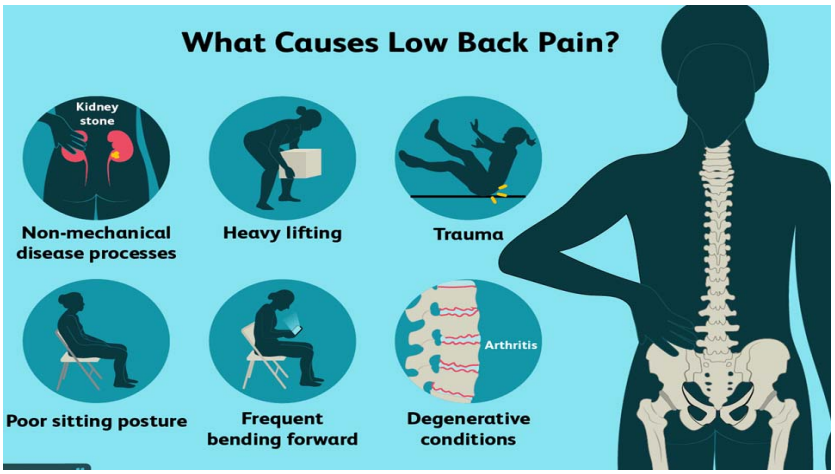
Keywords: Low Back Pain, Lumbar region, evaluation, patients, prevention

Introduction
Most epidemiological data concerning low back pain (LBP) are related to developed and industrialized countries but little information about LBP in the general population in developing and economically weaker countries. The lack of research leaves a profound gap in the knowledge of LBP in most part of the world, where the majority of the world's working population resides [1]. Worldwide surveys of LBP report a point prevalence of 15-30%, and a 1-month prevalence of 19- 43%. Worldwide estimates prevalence of LBP vary from 51 to 85%. It is often, challenging and controversial for clinicians. Low back pain is the pain of variable duration in the lumbar region of the spine. It is a cause of physical disability and mortality. In recent times it has become a major medical concern across the nations. Low back pain occurs as a result of numerous factors. Patient education and medications are beneficial.

Most persons experiences acute low back pain during their lifetime. LBP is the leading cause of activity limitation in both men and women. The first episode usually occurs between 21 to 40 years of age. Pain can be moderate to severe and debilitating. Many cases of acute LBP are self-limiting and resolve with little intervention. Howsoever, many patients with acute LBP go on to develop chronic pain. Chronic LBP is the most common cause of disability among people younger than 45 years and the third most common cause of disability among people aged 45-64 years [2]. It normally affects day-to-day activities and also the performance at work-place. Acute LBP is sometimes nonspecific and therefore cannot be attributed to a definite reason. Recurrent episodes are often more painful with aggravated symptoms. LBP occurs as a result of numerous aetiologies. It has a variable nature for different ethnic and age groups. The understanding of LBP will create apprehension in society of causes and risk factors associated with LBP which may be of help in taking preventive measures. LBP is a major public health problem globally, which causes pain, functional disability and poor quality of life. It is a common reason resulting in absence from work. In India, occurrence of LBP is alarming; nearly 60% of the people in India have significant back pain at some time or the other in lives. It affects people from all classes of the society. Most of the people of low income group in our country are engaged in physically demanding work. In upper group also, lack of physical activity leads to obesity and back pain. LBP is due to involvement of the vertebral bodies, intervening discs, ligaments, muscles, nerves, or other structures in the spine. The pain may be continuous or intermittent, experienced in one site or radiating to other areas. It is therefore, evident that this is a problem which requires finding of cause, effective treatment and merits the closest study. Identification of the risk factors of back pain can assist the Orthopaedist in taking preventive measures and rehabilitating patients. Low back pain is illustrated as a non-specific condition that refers to complaints of acute or chronic pain and discomfort in or near the lumbar region. 70% of acute back pain recovers with rest. Pain recurs in 70%. There are two types of back pain: Inflammatory, which are worst in the morning (after rest) and mechanical, which come up after exertion. Most common cause of backache is inappropriate posture, which increases the strain on the disc and ligaments causing faster disc degeneration. Facet joints and intervertebral discs are the two major units that work together to maintain the spinal kinematics. Ligament injury, muscle weakness, broken bones or injury to the intervertebral disc can all lead to abnormal biomechanics, and results in the development of low back pain. A number of risk factors are associated with LBP. The modifiable risk factors include life style (like poor muscle strength, physical activity, smoking, obesity) and occupational (bending, stooping, heavy lifting, twisting, prolonged sitting, sometimes awkward posture at work). The non-modifiable risk factors include number of children, increasing age, a previous episode of LBP and major spinal deformities. The aim of the study is to evaluate the different causes of low back pain, aetiological, occupational and risk factors, association with age and sex of the patient and their life styles. All the associated factors of LBP were compared with previous studies and conclusions to be drawn.

Materials and Methods

The present study is a retrospective study of 40 patients of low back pain between the age group of 21-85 years of both sexes who were admitted and treated at Dept. of Orthopaedics, Sri Lakshmi Narayana Institute of Medical sciences, Pondicherry, India from August 2020 to December 2020. The information was collected from the patients regarding their education, occupation, obesity, smoking, tuberculosis, diabetes, alcohol consumption, osteoporosis, Osteoarthritis and history of trauma. A proforma was prepared and the patient's age, sex, duration of symptoms, place of living and the cause for low back pain was noted. A complete neurological examination of the lower limbs was also done. The results were analysed and recorded. The series of investigations included clinical examination like measure of height, weight. Blood tests like complete blood count, erythrocyte sedimentation rate, fasting blood sugar, serum calcium and alkaline phosphatase, serum creatinine and phosphorous, protein electrophoresis, and serum uric acid; imaging included plain X-ray of the lumbosacral spine, AP and lateral views, plain Chest X-ray, CT scan and MRI Scan. All the findings were entered in proforma. The descriptive measures consisted of count and percentage. All the data entries were checked and edited after collection. Then the data were entered into a statistical analysis of the results was obtained by using windows base computer software Statistical Packages for Social Sciences.

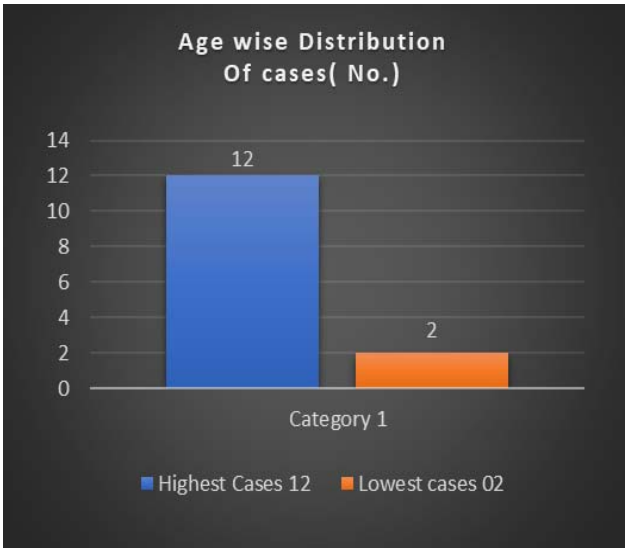


Symptoms, Causes, Preventing Low Back Pain

Results

Age Wise Distribution in Study Population

The author tabulated 40 patients of low back pain into four categories according to age and noted the number of cases in each group. The highest number of cases (12) is observed in the age group of 51-60 years (40%) and the lowest number of cases (2) is observed in the age group of 71-80 years (6%).



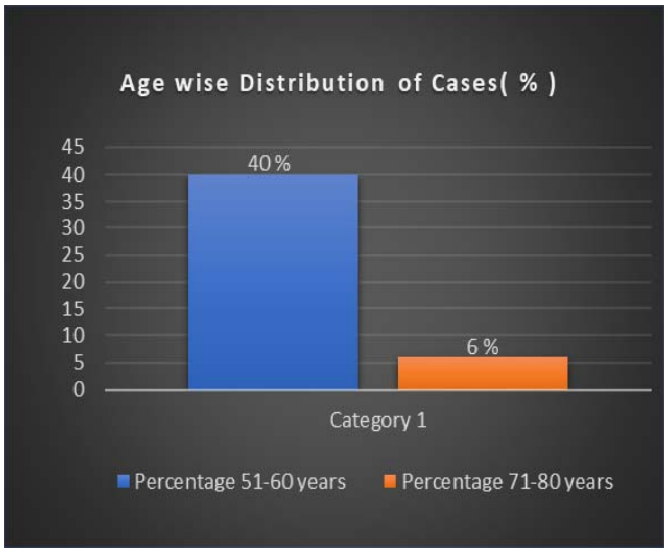
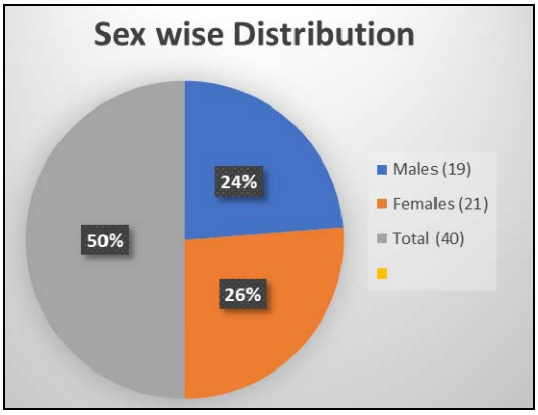


Table 1: Age and sex wise distribution in study population

Age Group	Males		Females		
	No. of cases	%	No. of cases	%	Total
20-30	01	5.2%	02	9.5%	03
31-40	04	21%	02	9.5%	06
41-50	02	10.5%	08	38%	10
51-60	05	26.3%	05	24%	10
61-70	06	31.5%	03	14%	09
71-80	01	5.2%	01	4.7%	02
Total	19		21		40

Sex Wise Distribution in Study Population

Among 40 cases of low back pain studied, there were 19 males (48%) and the number of females was 21(52%).



Age and Sex Wise Distribution in Study Population

As evident in table 1, among 40 cases of low back pain studied, the highest percentage of female (38%) in age group 41-50 and the highest percentage of male (32%) were found in the age group of 61-70 years

Area Wise Distribution in Study Population

Out of 40 cases studied, 10 cases (24%) of LBP came from rural areas for evaluation, treatment and follow up. In this group there was a higher incidence in females (28%). Similarly, there were 30 cases (76%) of LBP from urban area. This group showed a higher incidence in males (81%).

Association of Risk Factors with Low Back Pain

The following risk factors of low back pain were studied: Obesity, smoking, diabetes and alcohol consumption. There were 7 cases of obesity (18%), 14 cases of smoking (36%), 6 cases of diabetes (16%) and 6 cases of alcohol consumption (16%). The findings are described in table 2.

Table 2: Distribution of risk factors.

Risk factors	Number of cases	Percentage
Obesity	7	18%
Smoking	14	36%
Diabetes	6	16%
Alcohol Consumption	6	16%

Association of aetiological factors with low back pain

The following aetiological factors of low back pain were studied: Tuberculosis, steoporosis, osteoarthritis and depression. There were 13 cases of tuberculosis (4%), 33 cases of osteoporosis (11%), 26 cases of osteoarthritis (9%) and 9 cases of depression (3%). The findings are described in table 3.

Table 3: Distribution of aetiological factors

Aetiological Factors	No. of Cases (N)	Percentage%
Tuberculosis	1	4
Osteoporosis	5	11
Osteoarthritis	4	9
Depression	1	3

Association of Physical Risk Factors with Low Back Pain

In 40 cases of low back pain studied, there were 16 cases of heavy physical work (41%), 8 cases of prolonged sitting/standing (19%), 6 cases of definite history of fall/trauma (17%) and 5 cases of bad posture (12%). In 5 cases the cause for backache is unknown (12%). The findings are described in table 4.

Table 4: Distribution of physical risk factors

Physical Risk factors	No. of cases (N)	Percentage (%)
Heavy Physical work	16	41
Bad posture	5	12
Prolonged sitting / standing	8	19
H/o Fall /Trauma	6	17
Unknown	5	12
Total	40	100

Distribution of Causes of Low Back Pain in Study Population. In 40 cases of LBP studied, the most common cause for back pain was disc prolapse 17 (44%). The next common causes were lumbar spondylosis, lumbar spinal stenosis and spondylolisthesis (17%, 10% & 10% respectively). The results are indicated in table 5.

Table 5: The next common causes were lumbar spondylosis, lumbar spinal stenosis and spondylolisthesis

Causes	Males	Females	Total no. of cases (N)	Percentage (%)
Lumbar Spondylosis	3	4	7	17
Disc Prolapse	10	7	17	44
Spondylolisthesis	2	2	4	10
Lumbar spinal stenosis	1	3	4	10
Fractures	1	3	4	09
Tuberculosis (Koch`s) spine	1	1	2	04
Others	1	1	2	06
Total	19	21	40	100

Discussion

In view of the fact that adults constitute the majority of the active work force in the society, it is recommended that risk factors of back pain be more precisely identified in order to accelerate the rehabilitation of affected patients. Disc prolapse was the most common cause of LBP in accordance with other studies.

Few studies indicates that the risk of age for LBP differed according to the type of pain or the duration of the pain [3, 4]

Some studies have reported that the prevalence of LBP increases with age.

It is observed that large number of patients with back pain was aged between 31 to 60 years [5, 6]. Prevalence in different gender groups of LBP are frequently observed, but might differ in degree from country to country.

LBP has also been shown to be more common among women than men in some occupations [5, 20], whereas it is more frequent for men than for women in other occupations.

In the current study, the prevalence of LBP was higher among women than men. Few studies observed no gender specific backache.

Osteoporosis, RA, etc., are more common in females, while ankylosing spondylitis, trauma, etc., are more common in males.

In a study done by Leino-Arjas *et al*., [7] (body stature) height showed an association with back pain in women. While in other study the prevalence of LBP was associated with stature among men [8].

Further studies may be necessary as this association of tall stature with the occurrence of LBP was not reported in other studies [9, 10, 11] .

As a component of socioeconomic status, education is individual and does not change with time like occupations and income often do.

Measurement through education also avoids the problems of comparability due to unemployment.

The present study showed that obesity is associated with LBP. Positive associations between overweight and LBP have been observed in previous studies [5, 12-17].

Back pain had more influence on the life style habits on females than in males [5]. Further studies may be necessary as this association of weight with the occurrence of LBP was not reported in other studies [09, 18]

In few studies it was found that tuberculosis is a common cause of LBP [19-21]. While in one of the study it was found that tuberculosis was not much associated with low back pain.

In the present study, the prevalence of TB was less probably because of early diagnosis and effective treatment. People with sedentary jobs and heavy manual work are frequently prone for back ache [5].

Poor working postures are known to increase the rate of LBP [16, 22].

More number of cases of LBP is associated with housewives [5, 15] and sedentary life [5].

The findings in our study are correlating with that of Bener et al. [5].

Housewives tend to do most of the work around the house. This demands them to sit, stand or bend for long periods of time or to lift heavy weights. The severity of back pain may be doubled under stressful conditions at home. This may explain the high prevalence among housewives and partly explained the high prevalence of LBP among females in general population.

Many studies have shown that heavy physical work in general is associated with LBP

Heavy physical work involves long-term repetitive mechanical stress on structures in and around the spine, such as vertebral end-plates, intervertebral discs, muscles, tendons and ligament. This may result in injuries or evoke symptoms from already present weaknesses [23].

In accordance with other studies heavy physical work, prolonged sitting or standing, history of falls and repetitive work were significant risk factors for LBP in our study.

An association between smoking and LBP as observed in this study has been found in several epidemiological studies. While in few studies, there was no such association [5, 23, 24].

Other studies showed that smoking is significantly related to LBP even after correcting for many factors.

In a review, LebouefY de, suggested that smoking should be considered a weak risk factor but not a cause of LBP [25]. In one study it was concluded that by quitting smoking, the incidence of back pain can be reduced. In few studies, it was found that the prevalence of LBP increased in those with prolonged smoking [26]. Smoking leads to reduced perfusion and malnutrition of tissues in or around the spine [27, 28]. This may weaken the power of the spine's resistance to stress. It may also interfere with the healing of injuries [23].

The association between smoking and LBP has been reported to be stronger among persons who suffer from respiratory diseases, similar to heavy physical work, chronic cough and expiratory obstruction may also involve mechanical stress on spinal structures [23].

Smokers tend to have a lower physical and mental health status and thus show more depressive symptoms. Smoking also may vary with social class, education and occupation. No mechanism for the association between smoking and LBP has been established, but some researchers tried to explain the

association.

The results of our study confirm the association of the occurrence of LBP with smoking habits. Smoking is also associated with psychological risk factors, such as job dissatisfaction, lack of social support, job stress, and daily physical activity. Smoking may not be a direct cause of LBP, but only a confounding factor. Moreover, while smoking may be a cause of LBP, it may also be an effect of LBP.

In few studies depression was significantly associated with LBP [26, 29, 15]. In a previous study, workers exposed to high stress at home and at work also suffered a significantly higher rate of LBP [30]. In present study, the highest prevalence of depression in LBP was seen in patients between 41-50 years.

The findings are not correlating with the previous studies. The association of depression with back pain is more prevalent in developed countries than in developing countries, and that depression was more prevalent in women than in men.

The findings in the present study are correlating with previous studies [12]. Alcohol consumption was not a significant risk factor for LBP in this study, but another study has shown that alcohol abuse is significantly more frequent among patients with LBP [31].

Back pain is common in women who have had several pregnancies.

Lack of exercise leading to poor muscle tone and nutritional osteomalacia are contributory factors in the patients.

In one study it was found that LBP was associated with pregnancy, industrial exposure and time spent in a car [32].

Osteoarthritis is a degenerative, progressive disorder that commonly affects the knee and the back. The most common symptom of osteoporosis is backache secondary to vertebral compression. Associations between various factors and back pain have consistently been found in a number of studies. The results of this study are in line with the previous observations.

Preventing LBP is an important theoretical principle of treatment, but in practice it is difficult to implement because LBP has a variety of risk factors.

Clinical findings, in combination with radiological examination in particular, and MRI enable an early diagnosis to be established in cases like tuberculosis [21].

Obese person is of a higher risk of developing LBP and it is recommended that, health education regarding weight reduction is a useful means to prevent LBP.

Regular exercises like walking is of great help in adult population.

Health education is the most important aspect to prevent back pain. Proper posture during work; using ergonomically designed chairs; taking breaks from work at regular intervals; getting up, taking a short walk and sitting again for work is a good practice. Yoga and meditation helps to combat mental and physical stress.

Keeping realistic goals and philosophical attitude defuses mental tension and prevents burn out. High protein and calcium rich diet for osteoporosis patients; adequate rest; use of pain killers, muscle relaxants, supports like belt etc. are useful.

Conclusion

Low back pain affects a large proportion of the population and is difficult to diagnose.

Orthopaedist must accept the diagnostic ambiguity that often accompanies the condition. Identification of etiological and risk factors, cause for back pain and type of occupation and instituting preventive measures, as well as recovery of patients can lead to a meaningful reduction in the incidence of debilitating back pain.

Special attention must be given to the education of homemakers in terms of low back protection, healthy nutrition, and family planning.

Poverty points to a significant barrier to patient presentation to physicians, requiring extended social security coverage.

It is important to take comprehensive preventive measures to address a range of work and life conditions that can be improved to decrease the incidence of low back pain.

Within the public health context, it is important to prevent injuries and painful conditions by addressing modifiable risk factors.

Reference

1. Nachemson A, Jonsson E. The scientific evidence of causes, diagnosis and treatment. Lippincott Williams & Wilkins, 2000, 165-183.
2. Kuritzky L. Low back pain. Compr Ther 1997;23:332-336.
3. Lipscomb HJ, Dement JM, Loomis DP, Silverstein B, Kalat J. Surveillance of workrelated musculoskeletal injuries among union carpenters. Am J Ind Med 1997;32:629-640.
4. Leboeuf-Y de C, Lauritsen JM, Lauritzen T. Why has the search for causes of low back pain largely been non conclusive? Spine 1997;22:877-881.
5. Bener A, Alwash R, Gaber T, Lovasz G. Obesity and low back pain. Coll Antropol 2003;27(1):95-104.
6. Sanya AO, Omokhodion FO, Ogwumike OO. Risk factors for low back pain among hospital workers in Ibadan, Oyo State, Nigeria. Journal of the Nigerian Society of Physiotherapy 2005;15(2):31-34.
7. Leino-Arjas P. Smoking and musculoskeletal disorders in the metal industry: a prospective study. Occup Environ Med 1998;55:828-833.
8. Lau EM, Egger P, Coggon D, Cooper C, Valenti L, O' Connell D. Low back pain in Hong Kong: prevalence and characteristics compared with Britain. J Epidemiol Commun Health 1995;49:492-494
9. Burdorf A, Sorock G. Positive and negative evidence of risk factors for back disorders. Scand J Work Environ Health 1997;23:243256.
10. Han TS, Schouten JS, Lean ME, Seidell JC. The prevalence of low back pain and associations with body fatness, fat distribution and height. Int J Obesity Related Metab Disord 1997;21:600607.
11. Yip YB, Ho SC, Chan SG. Tall stature, overweight and the prevalence of low back pain in Chinese middle-aged women. Int J Obesity Related Metab Disord 2001;25:887-892.
12. De Costa C, Honeyman and Jacob 2002, 1-45.
13. Mohammed H, Tarawneh M, Mahadine Z. The association of low back pain with obesity in one of the primary health care centres. Bahrain Med Bull 2000; 22(1). Available from http://www.bahrainmedicalbulletin.com/march_ 2000/association.pdf
14. Heistaro S, Vartianen E, Heliovaara M, Puska P. Trends of back pain in eastern Finland, 19721992, in relation to socioeconomic status and behavioural risk factors. Am J Epidemiol 1998;148(7):671-682.
15. Altinel L, Kose KC, Ergan V, Isik C, Aksoy Y, Ozdemir A et al. The prevalence of low back pain and risk factors among adult population in Afyon region, Turkey. Acta Orthop Traumatol Turc 2008;42(5):328-333.

16. Tiwari RR, Pathak MC, Zodpey SP. Low back pain among textile workers. Indian Journal of Occup and Environmental Med 2003;7(1):2729.
17. Mortimer M, Wiktorin C, Pernold G, Svensson H, Vingard E. Sports activities, body weight and smoking in relation to low-back pain: a population-based case-referent study. Scand J Med Sci Sports 2001;11(3):178-192.
18. Kwon MA, Shim WS, Kim MH, Gwak MS, Hahm TS, Kim GS et al. A correlation between low back pain and associated factors: a study involving 772 patients who had undergone general physical examination. J Korean Med Sci 2006;21(6):1086-1091.
19. Pande KC, Pande SK, Babhulkar SS. An atypical presentation of tuberculosis of the spine. Spinal Cord, 1996;34(12):716-719.
20. Galukande M, Muwazi S, Mugisa DB. Aetiology of low back pain in Mulago Hospital, Uganda. Afr Health Sci, 2005;5:164-167.
21. Abou Raya S, Abou Raya A. Spinal tuberculosis: overlooked? J Intern Med 2006;260(2):160-163.
22. Yip YB, Ho SC, Chan SG. Tall stature, overweight and the prevalence of low back pain in Chinese middle-aged women. Int J Obesity Related Metab Disord 2001;25:887-892
23. Eriksen W, Natvig B, Bruusgaard D. Smoking, heavy physical work and low back pain: A fouryear prospective study. Occup Med (Lond) 1999;49(3):155-160.
24. Omokhidion FO, Umar US, Ogunnowo BE. Prevalence of low back pain among staff in a rural hospital in Nigeria. Occup. Med. (Lond) 2000;50(2):107-110.
25. Leboeuf-Yde C. Smoking and low back pain: A systematic literature review of 41 journal articles reporting 47 epidemiologic studies. Spine Phila Pa 1976; 24(14):1463-1470.
26. Desmond SC. An Epidemiological study of low back pain in a student population of South African Tertiary Education Institution 2004 Available from http://ir.dut.ac.za/handle/10321/294
27. Frymoyer JW, Pope MH, Clements JH, Wilder DG, Mac Pherson B, Ashikaga T. Risk factors in low back pain An epidemiological survey. J Bone Joint Surgery Am 1983; 65(22):213-218
28. Holm S, Nachemson A. Nutrition of the intervertebral disc: Acute effects of cigarette smoking. Uppsala J Med Sci 1988;93:91-99.
29. Bener A, El Rufaie OF, Kamran S, Georgievski AB, Farooq A, Rysavy M. Aplar Disability, depression and somatization in a low back pain population. Int J Rheum Dis 2006;9(3):257263.
30. Bongers PM, de Winter CR, Kompier MA, Hildebrandt VH. Psychosocial factors at work and musculoskeletal disease. Scand J Work Environ Health 1993;19:297-312.
31. Sandstrom J, Andersson GB, Wallerstedt S. The role of alcohol abuse in working disability in patients with low back pain. Scand J Rehab Med 1984;16:147-149.
32. Levangie PK. Association of low back pain with self-reported risk factors among patients seeking physical therapy services. American Physical Therapy Association 1999.