

Risk Factor Analysis in Sedentary Office Workers with Low Back Pain

Subramanian S¹, Arun B²

¹ Lecturer
MAHSA University
Kuala Lumpur
Malaysia

² Professor
K.G. College of Physiotherapy
Coimbatore
Tamilnadu, India.

CORRESPONDENCE:

¹ S.Subramanian, MPT
Lecturer
MAHSA University
Kuala Lumpur
Malaysia.
E-mail: kavisubbu06@gmail.com

ABSTRACT

Background and Objectives: Low back pain is one of the common musculoskeletal disorders in the office workers and it is the leading cause for long term sick leave. The life time prevalence of low back pain is estimated 60–85% and is the most common cause for work related disability in people under age of 45 years. Various studies have found that office workers are more prone to have low back pain symptoms. There was no study focus on the risk factor evaluation on the low back pain. The objectives of the study were to determine the prevalence and risk factors of low back pain among sedentary office workers.

Materials and Methods: A cross-sectional study was designed with 120 participants. Study was conducted on various locales like Schools, colleges, bank and office where the working was in an office environment, people included were working for more than 6 hours in a day or 30 hours in a week. A self-developed structured questionnaire was given to all participants with low back pain. Risk factors including personal factors, working factors, job stress, healthy behavior, and work environment were analyzed using descriptive analysis.

Results: Results finds that 62% of man and 80% of women complains of low back pain, where as 47% of male are obese and 43% of female are overweight.

Conclusion: Study concludes that back pain is strongly associated with various risk factors like obesity, poor posture and other factors.

Keywords: Low back pain, sedentary workers, obesity, BMI, risk factors

INTRODUCTION

The world wide impact of musculoskeletal injuries is about 4th in global health population. 75%-85% of the global population experience low back pain at some point during their lifetime. Approximately 50% of people have recurrence of the symptoms.^[1]

Low back pain is one of the commonest musculoskeletal injuries in the sedentary individuals, usually associated with high medical cost.^[2] Chronic back pain result in severe disability, this makes the individuals to find difficult even a minimal task.^[3]

Low back pain is the most common reason for sickness

absenteeism and it is one of the important causes for disability in industrialized countries.^[4]

Office workers are the professionals who sit in front of the computer for longer working hours. Individuals who occupy the static positioning for the longer duration will end up with several musculoskeletal injuries. Obtaining static posture like sitting, standing, bending and awkward lifting causes strain to the muscles and other structures.

The injuries relate to the occupation occur because of various reasons like static postures, awkward posture, repetition of activity, monotonous job tasks, extended work durations and job stress. Lengthened sitting or poor sitting produce imbalance between the muscle strength

and flexibility will eventually lead to low back pain with no movement loss or abnormal signs.^[5] Various studies focuses on prolong sitting and confirmed that it could be one of the risk factor for low back pain.^[6,7]

Risk factors are many in the magnitude of low back pain. Many epidemiological studies have identified several risk factors for the prevalence of low back pain in various occupational pursuits.^[8] Literatures find common risk factors and these were analyzed quantitatively and qualitatively, like gender, age and BMI.^[9,10] Few literatures also suggest that individuals with high body mass index have strongly associated with poor health and poor musculoskeletal function.

Researches also added that obese people are more frequent in seeking medical care for the joint pain and muscle complains.^[11] Evidences show that there is strong relation between the overweight and low back pain¹². Body fat distribution also showed associations with low back pain.^[13,14]

There are lack of evidences for the prevalence and risk factors of low back pain in sedentary individuals, as well as in office workers. This study is designed to find out the list of risk factors for the low back pain in sedentary office workers especially working in computers.

MATERIALS AND METHODS

A Cross sectional study was conducted over a period of 12 months. Samples were selected from various occupational perspectives based on convenient sampling method. No single occupation was selected in this study. Study was conducted on various locales like Schools, colleges, bank and office where the working was in an office environment.

A total of 120 samples were selected and self-developed structured questionnaire on back pain was given to all participants.

The selection criteria includes office workers working at least 6 hours in a day or 30 hours in a week, office workers working in computers, participants with no active exercises, subjects who excluded from the study are the individuals with pre existing arthritis or any other physiological problems like diabetes or hypertension, any history of trauma, history of cancer, and patients who use corticosteroids for longer period for other physiological problems.

Interview was conducted with self administered questionnaire along with it weight and height was measured. The interviewer explained about the study clearly, and the consent form was filled by all the participants.

The questionnaire consists of two parts, the first part includes demographic data and the second part includes the low back pain questionnaire. The components included were food habits, Duration of work, years of experience, stress, Body mass index, personal habits and foot wear types.

Data were analyzed using the SPSS. Difference in categorical variables was examined using descriptive analysis. The desired precision of confidence interval was set as 95% which was statistically significant.

RESULTS AND DISCUSSION

The data were analyzed using the descriptive statistics, the analysis was done using SPSS. 19.1. Various risk factors analysis was done based on Gender, Age, Year of experience, Stress, BMI, Smoking, Alcoholism, food habits, and type of foot wear. The analysis was shown in Table I & Table II.

Out of 120 individuals were included in the study 82 subjects complain of pain within a year. The number of male participants was assessed are 76 and the number of female are 44, out of which 47 males and 35 females complains of low back pain at least felt once in the 12 months. About 62% and 80% of population in male and female are affected respectively.

Table 1 : Demographic profile

Sl. No.	Characteristics Gender	Percentage (%)	
		Male	Female
1	Subjects with pain	62%	80%
2	Body Mass Index		
	Normal	17%	17%
	Over weight	36%	43%
	Obese	47%	40%
3	Duration of work		
	6—8 hours	4%	6%
	8—9 hours	24%	31%
	9—10 hours	38%	34%
	>10 hours	34%	29%
4	Year of experience		
	7 years	7%	17%
	8—10 year	19%	14%
	11—13 years	21%	40%
	>14 years	53%	29%
5	Foot wear		
	Shoe	51%	23%
	Sandals	38%	57%
	Flip tops	11%	20%
6	Work Stress		
	Yes	83%	80%
	No	17%	20%

Table 2 : Various risk factors and percentage

Sl. No.	Characteristics	Percentage (%)
1	Personal Habits	
	Smoking	
	Yes	49%
	No	51%
	Alcoholism	
	Yes	37%
No	63%	
2	Food habit	
	Veg	46%
	Non Veg	39%
	Only Egg	15%

Year of work experience were analyzed in table 1, which shows that 53% of male participants who work more than 14 years complains of more pain, followed by 21%, 19% and 7% for 11-13 year, 8-10 years and 7 years, whereas the female participants who work more than 11-13 years complain more pain at 40%, which was followed by 29% in more than 14 years, 17 % in 7 years and 14% in 8-10 years.

Duration of the work (hours of work) per day were assessed and analyzed in table 1, which shows that 38% of males and 34% of female work 9-10 hours per day, 34% of male complain back pain who work more than 10 hours where as 31% of female complains pain who works for 8-9 hours. 24% of males complain pain when they work for 8-9 hrs where as 29% of female complains of pain when they work for more than 10 hrs, and 4% of males and 6% of females complain pain when they work for 6-8 hrs in a day.

Body mass index were assessed in the participants using weighing scale and the height in centimeters. Around 47 male participants 39 participants were not normal (Overweight or Obese), only 8 were normal. Overall 83% of the participants are overweight or obese individual, 47% of participants were obese and 36% were overweight. Out of 35 female participants 29 were obese or overweight, that is 83% of participant’s falls in overweight or obese criteria. Whereas 43% of participants were in overweight category and 40% of them belong to obese category.

Obesity has moderately associated with low back pain, studies shows that there was increase risk of obesity in there is a persistent increase of body weight.^[15,16] Few studies have stated that the relationship is not well understood; whereas the back pain in obese individual may be because of accumulation of adipose tissues that cause over load in the spine¹⁷. Still there are unclear evidences of relationship between obesity and low back pain. A recent Meta analysis found that obesity and

overweight has strong association with low back pain.^[18]

Personal habits were analyzed in table II, two of the habits were analyzed, Smoking and Alcoholism. Out of 82 participants around 40 participants were smokers which average 51% and 49% are non smokers. 30 participants were alcoholic which ranges about 37% of overall participants, and 52% are non alcoholic. Out of 82 participants 38 person who is 46% are non vegetarians and 39% are vegetarians and 15% of participants consumes only egg. Smoking and alcoholism is the weak indicator for the low back pain.^[16]

Stress is one of the risk factor for musculoskeletal problem. Out of 82 participants 67 of them had complains of stress in job and 15 did not complain of stress in job. Further analyses were done in which 39 males and 28 females were complaining of stress. About 82% of participants complain of stress.

Psychological factors like stress has significant relation with the musculoskeletal disorders, Stress produce increase tension in the muscle, which may predispose to injury.^[19] Studies showed that stress at work has relation on consequences of low back pain.^[20,21] Studies also found that occupational stressors like environment, poor ergonomics are the important predictors of the musculoskeletal pain.^[22]

Foot wear was not much concerned with back pain history and incidence where as upon analysis the study found that out of 82 participants 38 were wearing sandals which means 46% of participants wore shoes, 32 with shoes and 12 with flip top, which states 39% in shoes and 15% with flip top. Similar type of study done by Marius in 2010 showed that 41% of individuals having symptoms at least one in past 12 months. Life time prevalence of the low back pain incidence is 58.3% and 62% in United Kingdom.^[23] Other countries also show prevalence of low back pain includes 19.7 in Nigeria, 34% in Netherland and 19% in Finland. ^[24, 25]

Many occupational analyses show that low back pain is the most common musculoskeletal complains followed by neck and shoulder.^[26] Absenteeism, reduced turnover, increased costs and reduced morale are reasons to the pain and disability that occurred due to long term use of computer and acquiring static posture at work.

Use of questionnaire in evaluating the persons with low back pain, no particular occupations were selected in this study, the quantity of work is not measured, non-inclusion of recreational activities are some of the limitations of this study. The same study can be replicated as experimental study by using interventions and can also done in other occupational disorders to identify the relationship of risk factors of occupations.

CONCLUSION

The findings of this study clearly states that low back pain was influenced by variety of factors. One of the important risk factor noted is the obesity and overweight, the participants who are overweight has strong positive influence on the back pain related symptoms. Other factors like stress also plays a role in back injury.

CONFLICT OF INTEREST :

The authors declared no conflict of interest

FUNDING : None

REFERENCES

- Marius AW. Low Back Pain In The Corporate Workplace; A South African Review, 2003, available: <http://Low Back Pain in the Corporate Workplace.html>.
- Woolf A, Pfleger B. Burden of major musculoskeletal conditions. *Bull World Health Organ.* 2011; 81:646-656.
- Katz R. Impairment and disability rating in low back pain. *Clin Occupational Environmental Med.* 2006; 5: 719-740.
- Barbara A, Niland J, Patricia J. *Fundamentals of Industrial Hygiene.* National safety council. Saunders, Washington, USA, 2003.
- Mckenzie RA, May S. *Lumbar Spine mechanical diagnosis and therapy.* 2nd edition. Walkane: Spinal publication, NZ, 2003.
- Corlett EN. Background to sitting at work: research requirements for the design of work seats. *Ergonomics.* 2006 ; 49: 1538-1546.
- Pope,MH, Goh, KL, Magnusson, ML. *Spine ergonomics. Annual Review Biomed Eng.* 2002; 4: 49-68.
- Mortimer M, Wiktorin C, Pernold G, Svensson H, Vingard E. Sport's activities, body weight and smoking in relation to low back pain: a population based case referent study. Result from the MUSIC-Norrtalje study. *Scand J Med Sci Sports.* 2001; 11:178-192.
- Kerr MS, Frank JW, Shannon HS, Norman W R, Wells R P, Neumann W P, Bombardier C, and Ontario Universities Back Pain Study Group Ontario Universities Back Pain Study Group. Biomechanical and psychosocial risk factors for low back pain at work. *Am J Public Health.* 2001; 91:1069-1075
- Ijzelenberg W, Molenaar D, Burdorf A. Different risk factors for musculoskeletal complaints and musculoskeletal sickness absence. *Scand J Work Environ Health.* 2004; 30:56-63.
- Seidell JC, De Groot LCPGM, Van Sonsbeek JLA, Deurenberg P, Hautvast JGAJ. Associations of moderate and severe overweight with self-reported illness and medical care in Dutch adults. *Am J Public Health.* 1986; 76: 264-269.
- Popkess-Vawter S, Patzel B. Compounded problem: low back pain and overweight in adult females. *Orthop Nurs.* 1992; 11:31-35.
- Wright D, Barrow S, Fisher AD, Horsley SD, Jayson MI. Influence of physical, psychological and behavioral factors on consultation for back pain. *Br J Rheumatol.* 1995; 34:156-161.
- HelioEvaara M. Body height, obesity, and risk of herniated lumbar intervertebral disc. *Spine.* 1987; 12:469-472.
- Bener A, Alwash R, Gaber T, Lovasz G. Obesity and low back pain. *CollAntropol.* 2003; 27:95-104.
- Leboeuf-Yde C Smoking and low back pain. A systematic literature review of 41 journal articles reporting 47 epidemiologic studies. *Spine.* 1999; 24:1463-70.
- Adams MA, Roughley PJ. What is intervertebral disc degeneration, and what causes it. *Spine.* 2006; 3:2151-61.
- Shiri R, Karppinen J, Leino-Arjas P, et al. The association between obesity and low back pain: A meta-analysis. *Am J Epidemiol.* 2010; 2:135-54.
- Rick J, Thomson L, Briner RB, O'Regan S, Daniels K. *Review of existing supporting scientific knowledge to underpin standards of good practice for key work-related stressors-Phase I.* Contract Research Report 427, Health and Safety Executive Books, Sudbury, UK, 2002.
- Elfering A, Grebner S, Semmer NK, et al. Time control, catecholamines and back pain among young nurses. *Scand J Work Environ Health.* 2002; 28:386-93.
- Wickstrom GJ, Pentti J. Occupational factors affecting sick leave attributed to low-back pain. *Scand J Work Environ Health.* 1998; 24:145-52.
- Wu Chen, I Yu, T Wong. Impact of occupational stress and other psychosocial factors on musculoskeletal pain among Chinese offshore oil installation workers. *Occup Environ Med.* 2005; 62: 251-256.
- McKinnon ME, Vickers MR. Community studies of the health service implication of low back pain. *Spine.* 1997; 22:2161-2166.
- Omokhodion FO, Sanya AO. Risk factors for low back pain among office workers in Ibadan, Southwest Nigeria. *Occup Med (Lond).* 2003; 53:287-289
- Burdorf A, Naaktgeboren B, de Groot HC. Occupational risk factors for low back pain among sedentary workers. *J Occup Med.* 1993; 35:1213-20.
- Smith DR, Kondo N, Tanaka E, et al. Musculoskeletal disorders among hospital nurses in rural Japan. *Rural Remote Health.* 2003; 3: 241.