

# The Prevalence of low Back Pain among flight Attendants in Bangalore

Dr Jyoti Kataria, Dr Nikita  
Assistant Professor, Chief Physiotherapist  
School of physiotherapy  
Delhi Pharmaceutical Sciences and Research University  
Govt of NCT, New Delhi, India

## Abstract

### Background

Musculoskeletal pathologies observed most frequently in past decade and has affected significantly activities of daily living. Prevention of Work-related Musculoskeletal Disorders (WMSDs) is becoming crucial and requires the identification and modification of risk factors. With respect to site of pathology or disorder most frequently observed site is lower and upper back. Individual characteristics of the worker which may lead to development of back pain involves working in static position for long duration, female are more prone to develop back pain, weak musculature, poor physical conditioning, long working hours etc. flight attendants work involves standing for long hours, excessive forward bending, kneeling, lifting objects which are very heavy, lot of activities involves pushing and pulling of carts contain meals for passengers. Since airline industry is growing very fast worldwide and since there is lack of scientific evidence which describes health status of flight attendants due to their work requirement they are more prone to develop musculoskeletal disorders hence purpose of present study was to get prevalence of low back pain and other associated factors which may lead to development of musculoskeletal disorders

### Materials and methods:

The present study was a one-time cross-sectional survey study, which included a sample of 145 flight attendants. Subjects of either gender satisfying the inclusion criteria were taken up for the study. An informed consent was taken before the procedure. Each subject's demographic data was collected. The Questionnaire was given to the study population

**Results:** Descriptive statistics was used to find out the prevalence of LBP. Chi square test was used to test the association of LBP to age, gender and number of working years. Independent t test was used for the comparison of difference in mean age and number of working years among those with LBP and without LBP group. Confidence interval was computed as 95%. Low back pain prevalence in flight attendants was 69.7%. Results also showed association between age and LBP ( $p < 0.001$ ), which was very highly significant and association between work experience and LBP ( $p < 0.001$ ) which also indicated a very high significance. This difference in mean between age, years of work among those with LBP and without LBP ( $p < 0.001$ ) was found to be statistically highly significant. There was no correlation found between gender and LBP.

**Conclusion:** Flight attendants have a high prevalence of LBP. Age and work experience are the two factors closely related with LBP. There was no association found between gender and LBP.

**Key words:** Low back pain, flight attendants, prevalence, musculoskeletal disorders

## INTRODUCTION

Musculoskeletal disorders have become increasingly common worldwide during the past decades.<sup>1</sup> They are the significant contributors to work related disability and a major cause of sick leave.<sup>2</sup> By definition, musculoskeletal disorder refers to the presence of injury or pain with the muscles, skeletal systems, joints, connective tissue (ligaments and tendon), associated nerves or soft tissue. Pain is the most common symptom in this disorder and may present in a distinct localized manner or as an ongoing ache over a broad anatomical region.<sup>2</sup> The World Health Organization defines MSDs as “disorders of the muscles, tendons, peripheral nerves or vascular system not directly resulting from a acute or instantaneous event (e.g., slips or falls). These disorders are considered to be work-related when the work environment and the performance of work contribute significantly, but are only one of a number of factors contributing to the causation of a multi-factorial disease.”<sup>3</sup>

The past two decades have witnessed a sharp rise in the incidence of work-related musculoskeletal disorders (WMSDs). Prevention of WMSDs is becoming crucial and requires the identification and modification of risk factors. Individual

characteristics of the worker such as gender, age, stature, physical condition, strength, etc. may contribute to the occurrence of these musculoskeletal disorders. Moreover, the specific occupation and work organization may be the source of ergonomic hazards. Awkward postures, prolonged repetitive movements, intense work schedules or fast work pace represent important risk factors for WMSD.<sup>4</sup> In terms of location, the lower back was the most commonly reported site of discomfort. Risk factors for pain in lower back included duration of standing, waist-bending and weight-lifting.<sup>6</sup> Mechanical Low Back pain (MLBP), non-mechanical pain and visceral disease are some of the various known types of Low Back Pain. It is caused due to an unspecific injury to the lumbar spine and hence, it represents up to 97 % of patients with this problem.<sup>7</sup> Point prevalence ranges from 12 % to 33 %, one year prevalence ranged from 22 % to 65 % and life time prevalence ranged from 11 % to 84 %.<sup>8</sup> Low back pain is the largest single cause for about 12.5% of all sick leaves.<sup>9</sup>

The purpose of this study is to identify self-reported prevalence and to analyse the risk factors in relation to low back pain among flight attendants

## METHODOLOGY

The study included a sample size of 145 flight attendants between 25 to 35 years of age working in Jet Airways, Bangalore. *Inclusion criteria:* Flight attendants working for more than 3 years in the airline industry, Age group : 25 to 35 years, Both males and females were included in the study. *Exclusion criteria:* History of any back injury in the past 1 year, Any known neurological disorders, Pre-existing musculoskeletal pathology of the lower back.

**Materials used:** A self-administered questionnaire. This questionnaire was divided into two groups: For people with LBP and for people without LBP. The questions for people with LBP was divided into 6 sections that included the onset and description of pain, subject's personal characteristics such as age, sex and years employed in occupation, respondent's job history, physical risk factors at work and general health status, a section about sleep, functional activities and the social life. The questions for people without LBP was divided into 3 sections namely, subject's personal characteristics such as age, sex and years employed in occupation, the job characteristics, functional activities and the social life. The questionnaire was distributed to physiotherapists who specialize in musculoskeletal and LBP, they evaluated the questionnaire for aspects related to LBP assessment such as specificity. The questionnaire was also given to senior flight attendants who evaluated the questionnaire for appropriateness and their daily work activities and representation of their daily living activities that may predispose them to low back pain. The questionnaires were collected back and revised again. The revised questionnaires were validated again by the same group of people and the face validity was thereby obtained.

**Procedure of Data collection -** Subjects of either gender satisfying the inclusion criteria were taken up for the study. The intent of the research was well explained to all the participants. An informed consent was taken before the procedure. Each subject's demographic data was collected. The Questionnaire was given to the study population A self-administered questionnaire for LBP comprising of several questions on low back trouble was distributed to the selected subjects. The questionnaire was very user friendly and was designed to take approximately 10 minutes to complete. A variety of questions were used which involved yes or no response, rating the symptoms, etc. In addition, the subjects were requested to mark the location of the symptoms suffered on a pictorial diagram. Subjects with LBP were further investigated with a YES questionnaire and subjects without LBP were investigated with a NO questionnaire. There was strictly no interaction allowed between the subjects. The filled questionnaire was collected at the same time and the data was taken for the statistical analysis

**Data Analysis** Descriptive statistics was used to find out the prevalence of LBP. To study the association of low back pain with age and other factors Chi square test was utilized. Independent t test was used for the comparison of difference in mean age and number of working years among those with low back pain and without low back pain group. Confidence interval was computed as 95%.

**RESULTS****Table 1:** Prevalence of low back pain

| Variables             | F   | f %    |
|-----------------------|-----|--------|
| <b>With Back pain</b> | 101 | 69.7 % |
| <b>No Back pain</b>   | 45  | 30.3 % |
| <b>Total</b>          | 145 | 100 %  |

**Table 2:** Age distribution

| AGE | Group                 | N   | Min (years) | Max (years) | Mean (years) | Std. Deviation | Std. error |
|-----|-----------------------|-----|-------------|-------------|--------------|----------------|------------|
|     | <b>No Back pain</b>   | 44  | 25          | 30          | 26.61        | 1.674          | 0.252      |
|     | <b>With Back pain</b> | 101 | 25          | 35          | 30.16        | 2.279          | 0.227      |

**Table 3:** Gender distribution of the study population by presence of low back pain

| Gender                         | With Back pain | No Back pain | Total      |
|--------------------------------|----------------|--------------|------------|
| <b>Male</b>                    | 37 (64.9%)     | 20 (35.1%)   | 57(100.0%) |
| <b>Female</b>                  | 64 (72.7%)     | 24 (27.3%)   | 88(100.0%) |
| <b>Total</b>                   | 101 (69.7%)    | 44(30.3%)    | 145(100%)  |
| Chi Square test, df=1, p=0.317 |                |              |            |

From the above table it is observed that there were 64 females and 37 males who reported of having LBP and 24 females and 20 males did not have LBP. The association between gender and low back pain was not statistically significant.

**Table 4:** Work experience

| No of years | With Back pain | No Back pain | Total      |
|-------------|----------------|--------------|------------|
| <b>3</b>    | 2 (8.3%)       | 22 (91.7%)   | 24(100.0%) |
| <b>4</b>    | 12(38.7%)      | 19(61.3%)    | 31(100.0%) |
| <b>5</b>    | 20(87.0%)      | 3(13.0%)     | 23(100.0%) |
| <b>6</b>    | 18(100.0%)     | 0(0.0%)      | 18(100.0%) |
| <b>7</b>    | 14(100.0%)     | 0(0.0%)      | 14(100.0%) |
| <b>8</b>    | 12(100.0%)     | 0(0.0%)      | 12(100.0%) |
| <b>9</b>    | 1(100.0%)      | 0(0.0%)      | 1(100.0%)  |
| <b>10</b>   | 16(100.0%)     | 0(0.0%)      | 16(100.0%) |

|              |             |           |           |
|--------------|-------------|-----------|-----------|
| 12           | 6(100.0%)   | 0(0.0%)   | 6(100.0%) |
| <b>Total</b> | 101 (69.7%) | 44(30.3%) | 145(100%) |

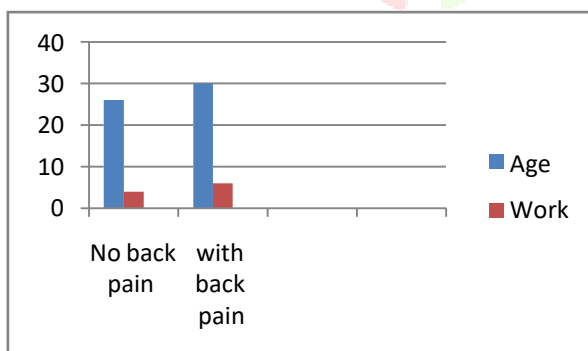
From the above table it is seen that with the increase in the duration of years of work, the prevalence of LBP increases.

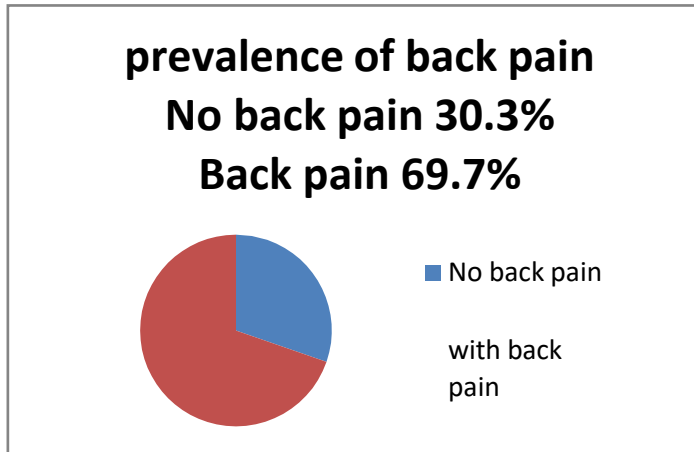
**Table 5:** Comparison of mean age and years of work with low back pain

| Variable                          | Response       | N   | Mean  | Std. Deviation | Std. Error Mean | P value |
|-----------------------------------|----------------|-----|-------|----------------|-----------------|---------|
| Age                               | No Back        | 44  | 26.61 | 1.67           | 0.25            | <0.001  |
|                                   | With Back pain | 101 | 30.16 | 2.28           | 0.23            |         |
| Years of Work                     | No Back        | 44  | 3.57  | 0.63           | 0.09            | <0.001  |
|                                   | With Back pain | 101 | 6.90  | 2.34           | 0.23            |         |
| <b>Independent t test, df=143</b> |                |     |       |                |                 |         |

From the above table mean ( $\pm$ SD) age among those with low back pain and without lowback pain was 30.16 ( $\pm$ 2.28) and 26.61( $\pm$ 1.67) respectively. Similarly for years of work it was 6.90 ( $\pm$ 2.34) and 3.57 ( $\pm$ 0.63) respectively. This difference in mean between age, years of work among those with low back pain and without low back pain was found to be statistically highly significant.

**Graph 1:** Association of age, work experience with LBP



**Pie chart 1:** Prevalence of low back pain

**Discussion** The purpose of this study was to find out the prevalence of low back pain among flight attendants and to analyze the risk factors in relation to low back pain. In the current study, total sample size of 145 subjects was selected from Jet Airways, Bangalore after they met with both inclusion and exclusion criteria. Hence, in the present study the total sample of 145 subjects (n=145) ranging in age from 25 to 35 years with a mean age of 26.61 years  $\pm$  1.67 years, mean working experience of 3.57 years  $\pm$  0.67 years for people with no pain and with a mean age of 30.16 years  $\pm$  2.27 years, mean working experience of 6.90 years  $\pm$  2.34 years for people with pain were included in the study. All the subjects were distributed with the self-administered questionnaire and were collected on the same day. The results found were as follows. The prevalence of self-reported LBP was 69.7%. Out of 145 subjects, 101 subjects reported of having LBP at least once in the past 6 months.

In the present study, the higher prevalence of LBP was found in higher age groups. Out of 145 subjects, 101 subjects who reported of having LBP had a mean of 30.16 years and 44 subjects who reported of having no back pain had a mean of 26.61 years. By using an Independent t test, comparison of mean age between the groups was statistically highly significant ( $p < 0.001$ ) indicating association between age and low back pain. The study also investigated the role of age and work experience in relation to low back pain. The results show that low back pain increased with increasing age. Age has been proposed as a prognostic factor. A review by Malchaire J et al., revealed that the association between age and musculoskeletal problem was evident in half of the studies which included age as a risk factor.<sup>34</sup>

Out of 101 subjects who reported of having LBP, 64 were females and 37 were males. On analyzing the data for gender and LBP using Chi square test, the association between gender and LBP was not statistically significant. Erdil M et al. found that the prevalence of low back pain is highest between the ages of 35 and 55 years and there are no significant gender differences.<sup>35</sup> This may be because the workloads of male and female flight attendants are similar in nature and may be below the threshold level of work where gender differences such as strength and endurance may affect the results of the study.

**CONCLUSION** Flight attendants have a high prevalence of LBP of about 69.7%. Age and work experience are the two factors closely related with LBP. Risk factors such as repetitive movements, heavy and frequent lifting along with awkward postures (bending, twisting), prolonged standing, intense work schedules may be associated with a risk of developing LBP. There was no association found between gender and LBP.

#### References

1. Andersson GBJ. Epidemiologic features of chronic low back pain. *The Lancet* 1999;354(9178):581-5.
2. Smith DR, Leggat PA. Musculoskeletal disorders in nursing. *Australian Nursing Journal* 2003;11:1-4.
3. Identification and control of work-related diseases: a report of a WHO expert committee. *WHO Tech Rep Ser* 1985;714:7-11.
4. Sartario F, Vercelli S, Ferriero G, D'Angelo F, Migiliario M, Frachiognoni M. Work related musculoskeletal disorders in dental professionals. 1. Prevalence and risk factors. *G. Ital Med LavErgon* 2005 Apr-Jun;27(2):165-9.

5. Harkness EF, Macfarlane GJ, Silman AJ, McBeth J. Is musculoskeletal pain more common now than 40 years ago? Two population-based cross-sectional studies. *Rheumatology (Oxford)* 2005;44(7):890-5.
6. Hou JY, Shiao JS. Risk factors for musculoskeletal discomfort in nurses. *J.Nurs Res* 2006 Sep;14(3):228-36.
7. Oriyes-Perez SE, Oriyes-Perez RS, Munoz-Dobarganes A, Sotolongo Alonso M, Cabarello Casanova FR. Mechanical low back pain: Prevention. *The Internet Journal of Neurology* 2008;9(2).
8. Walker BF. Prevalence of low back pain: A systematic review of the literature from 1966 to 1998. *Journal of spinal disorders* 2000;13(3):205-217.
9. Jazayeri SM. Study of relationship between Psychosocial profile and chronic low back pain. *MJIRC* 2006;8(4).
10. Macfarlane GJ, Thomas E, Papageorgiou AC, Croft PR, Jayson MI, Silman AJ. *Spine* 1997 May 15;22(10):1143-49.
11. Waddell G, Burton AK. Occupational health guidelines for the management of low back pain at work: An evidence review. *Occupational medicine* 2001;51(2):124-135.
12. Ranney D, Ranney A. Chronic musculoskeletal injuries in the work place. Philadelphia: W.B Saunders;1997.
13. Waddell G. The back pain revolution. 2<sup>nd</sup> ed. London: Elsevier Limited; 2004.
14. Deyo RA. Conservative therapy for low back pain. *The Journal of the American Medical Association* 1983;250:1057-62.
15. Jung MC, Haight JM, Freivalds A. Pushing and pulling carts and two-wheeled hand trucks. *International Journal of Industrial Ergonomics* 2005;35(1):79-89.
16. Pombal R, Peixoto H, Lima M, Jorge A. Permanent medical disqualification in Airline cabin crew: Causes in 136 cases,1993-2002. *Aviation Space Environmental Medicine* 2005;76:981-4.
17. Pope M. Muybridge lecture. In: Proceedings of the International Society of Biomechanics XIV congress, Paris July 1993.
18. Armstrong TJ. Ergonomics and cumulative trauma disorders. *Hand clin* 1986;2:553-65.
19. Michael R. News- Ergonomics Today, Definitions in Ergonomics, Feb 20, 2002. 20. Walsh K, Varnes N, Osmond C, Styles R, Coggon D. Occupational causes of low back pain. *Scand J Work Environmental Health* 1989;15:54-9.
21. Bernard BP. Musculoskeletal disorders and workplace factors: A critical review of epidemiological credence for work related musculoskeletal disorders of neck, upper extremity and low back. NIOSH July 1997.
22. Ingram J. Lifting and your back. Preventing Back Injury. www.northsuburban.com 23. Atcheson S. Other causes of CTS. *Archives of Internal Medicine* 1998;158(1496):1506-12.
24. Hills EC. Mechanical Low Back Pain. E-medicine online Journal 2009.
25. Xu Y, Bach E, Orhede E. Work Environment and low back pain: the influence of occupational activities. *Occupational and Environmental Medicine* 1997;54(10):741-45.
26. Burdorf A, Sorock G. Positive and negative evidence on risk factors for back disorders. *Scand J work Environ Health*;23:243-56.
27. McCulloch J. Health risks associated with prolonged standing. *Work Reading Mass* 2002;19(2):201-5.
28. Herrin GD, Garret M, Anderson CK. Prevention of overexertion injuries using biomechanical and psychological modes. *Am Ind Hyg Assoc J* 1986; 47(6):322-30.
29. Miner MA. Cumulative damage in fatigue. *J ApplMech Trans ASME* 1945;12:159-64.
30. Marras WS, Lavender SA, Leurgans SE, Fathalla FA, Ferguson SA, Allread WG, Rajulu SL. Biomechanical risk factors for occupational related low back disorders. *Ergonomics* 1995;38(2):377-410.
31. Andersson GBJ. On myoelectric back muscle activity and lumbar disc pressure in sitting postures. [Dissertation]. Goteborg, Sweden: University of Goteborg 1974.
32. Ono Y, Watanabe S, Kaneko S, Matsumoto K. Working hours and fatigue of Japanese flight attendants. *Journal of Human Ergology* 1991;20(2):155-64.
33. Pombal R, Peixoto H, Lima M, Jorge A. Permanent medical disqualification in Airline cabin crew: Causes in 136 cases,1993-2002. *Aviation Space Environmental Medicine* 2005;76:981-4.
34. Malchaire J, Cock N, Vergracht S. Review of the factors associated with musculoskeletal problems in epidemiological studies. *Int Arch Occup Environ Health* 2001;74(2):79-90.
35. Erdil M, Dickerson OB. Cumulative trauma disorders-Prevention, Evaluation and treatment. NYC, NY: Van Nostrand Reinhold 1997