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Low Back Pain and Related Factors among Iranian Office Workers

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ABSTRACT

Low Back Pain (LBP) is likely the most common medical disorder among work population. In this survey, prevalence of LBP and pain severity and the association of them with occupational and non-occupational risk factors were specified among office workers in Baqiyatallah University Of Medical Sciences, Tehran, Iran in 2006 In this way the point prevalence of LBP and pain severity among office workers, role of some personal and occupational factors, and self-reported pain severity were assessed. The instruments used included direct interview, a body discomfort assessment tool that consisted of a 10-centimeter color Visual Analogue Scale (VAS) and a questionnaire. Face to face, interview was done for measuring of weight and height of subjects. Of 1580 volunteers, 1436 persons were participated. About 80% (79.8%) of respondents were male. Mean age of responders was 35.08 years. More than 60% had at least one episode of LBP during their working life and 45.0% of pain sufferers' first attack was during their employment. Lifetime prevalence of LBP was 92.1% and this result for last 12 months was 37.3%. Increased age up to 40 years, increased weight, sitting work style more than 4 hours, computer use more than 5 hours a day also past history of LBP had a positive association with increased like hood of occurrence of LBP. LBP had a high prevalence in office workers. This study might help to estimate low back problems in office workers and emphasize healthy lifestyle, ergonomic measurement and control, good posture and holding educational programs.

Keywords: *Low Back Pain, Related factors, Prevalence*

INTRODUCTION

Worldwide low back pain (LBP) is one of the most common health problems in workplace and after respiratory symptoms; it is the most common reason for referral to the physicians [1]. Because of its frequency and poor effects on active daily living LBP is considered a full-scale health problem [2].

LBP is a major cause of disability and results in enormous direct/indirect costs in western, industrialized countries [3]. However, in developing countries because of under reports revealed by forgetting the episodes of LBP along with time spending the prevalence may show itself lower than real statistics [4]. Disability due to LBP is influenced not only by the physical tasks of an individual person, but also by other personal and medical factors including medical care, work environment, and workers' compensation process [5].

Being prevalent among office workers, LBP is an attractive topic for researchist studying work populations. In a survey conducted in the Dutch work groups including office workers musculoskeletal disorders especially low back pain were associated with long duration sickness absence [6]. The prevalence of

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Table 1. Age pattern of past 12 months LBP positives

Age group (yr)	N (%)
<20	12(2.0)
21-30	165(28.0)
31-40	279(47.3)
41-50	123(20.8)
>50	11(1.9)
Total	590(100.0)

low back pain had higher odds ratio compared to other regional pains among Japanese office workers [7]. In addition, the role of occupational factors has been noticed in some studies. Physical work tasks increased the prevalence of LBP among office workers [8].

We performed an investigation in Baqiyatallah University of medical sciences, Tehran, Iran in 2006 to specify the prevalence of LBP and pain severity and relation of these results to occupational and non-occupational risk factors, absenteeism pattern of pain sufferer, medical management, and consultant, and other related subjects.

MATERIALS AND METHODS

Our study was carried out to establish the pattern of LBP associated with office working in Baqiyatallah University of Medical Sciences in 2006. We defined an office worker as everybody who was spending at least 30 hours of his or her work time behind the desk. The study group consisted of everybody employed at least one year ago without any history of back trauma, any type of cancer and prolongs systemic use of corticosteroid. The instruments used were direct interview, a body discomfort assessment tool that consisted of a 10-centimeter color visual analogue scale and a questionnaire [9].

Face to face, interview was done for measuring of weight and height of subjects. In addition, in this stage the interviewer explained about what our aim was about LBP and pain radiation. This interview was conducted by a trained physician

After this step, respondents were asked to point one location of VAS scale, which they thought represented the maximum severity of their LBP during last 12 months. This part of the study included a body discomfort assessment tool. Reading was according to interval (centimeter) between this point and the point of zero e.g. 2 or 8.2, etc which 10 represented the highest pain severity.

After this step, the participants were asked to fill the questionnaire. The questionnaire consisted of two sections. The first one requested background and demographic characteristics (age, sex, years of employment, task). The second section consisted of LBP related questions as: Present LBP, experience of LBP during last 12 months (which defined as "LBP group" or "pain positives"), pain severity, pain radiation, past history of LBP, hours of daily use of computer, history of consulting with physician, awareness about back care, participate in instructional courses, existence of regular exercise program. The main occupational risk factors assessed in this study were prolonged sitting, waist rotating over hip and forward bending.

To establish the validity of the questionnaire a three-member committee consisted of the one epidemiologist and two specialists in occupational medicine approved face and content validity of the questionnaire.

A pilot studies were carried out 2 months before the main work in order to revision the methods. In addition, the examiner physician passed a 4-hour educational course.

Data were entered in to SPSS. Differences in categorical variables were examined using chi-square test and continuous variables were initially examined using the student *t* test. Effect of variables on the occurrence of LBP was analyzed by logistic regression analysis

The desired precision (total width) of confidence interval was set as 95% and a *P* value <0.05 was considered as statistically significant. The expected frequency was set as a conservative 50%. Using this method the minimum sample size required was 1536.

RESULTS

Of 1580 volunteers, 1436 persons were participated in the study. About 80% (79.8%) of respondents were male (1146 persons). Mean age of respondents was 35.08 years (range of 20 to 80 years).

Cigarette smoking had a prevalence of 1.7%. Mean and standard deviation of Body Mass Index (BMI) were 26±1.3 kg/squared meter respectively (19.18 to 39.00).

Among participants, 63% had regular use of computer with mean time of 15±3 hours weekly. Average duration of computer work was 2.3 years. Eighteen percent of subjects had been using computer for more than 5 years and this result for up to 2 and 4 years were 46% and 36 % respectively.

Our research showed that 877 persons (61.1%) had at least one episode of LBP during the working life and among LBP group, 45.0% of first attacks were during the employment. The mode age of first experience of LBP was 29 years (mean value of 32.53 years).

Lifetime prevalence of LBP was 92.1% (95% CI 90.5 – 93.7). In addition, one year and point prevalence were 37.3% (95% CI 36.1 – 38.5) and 13.7% (95% CI 12.2 – 15.2) respectively. Mean age in which the first pain attack has been occurred was 28.4 years (95% CI 27.7-29.2, median 25 years). Sciatic pain was seen in 14% of LBP group (75 persons). As shown in Table 1, rate of one year LBP had a downside after the age of 40.

The proportion of LBP group who had consulted a physician was 41 % (359 patients). The most common Consulted physicians were general practitioner, orthopedists, and neurosurgeons respectively. There was no association between pain severity and physician consults (*P*=0.843)

Our Findings showed that in past 12 months 87.9% of pain positives had at least one location of musculoskeletal pain other than back area mainly neck (53.2%), shoulder (43.5%) and knee (39.2%).

Table 2. Factors associated with having Low Back Pain in office workers

Factors	LBP (%)	No LBP (%)	OR	95%CI
Age				
<20	2.0	1.0	1.68	1.13-2.11
21-30	28.0	37.8	1.94	1.36-2.60
31-40	47.3	36.7	1.97	1.30-2.73
41-50	20.8	23.5	2.14	1.03-3.01
>50	1.9	1.0	1.55	0.99-2.00
Sex				
Male	70.2	84.8	1.02	0.68-3.34
Female	29.8	15.2	1.32	0.80-3.54
Weight(Kg)				
<50	0.1	2.0	1.64	1.22-2.17
51-70	28.8	30.6	1.75	1.34-2.36
71-90	59.2	54.1	1.94	1.55-2.60
>90	11.9	13.3	2.36	1.39-2.44
Daily sitting time in the workplace(hr.)				
<4	12.9	16.3	1.55	0.66-1.65
4-8	64.5	63.5	2.33	1.79-2.09
>8	22.6	20.2	2.57	2.13-3.05
Smoking				
Yes	1.6	1.9	1.01	0.85-1.36
No	98.4	98.1	0.87	0.35-1.52
Employment(Yr)				
<10	44.6	51.0	1.25	0.60-1.46
11-20	25.0	25.0	1.35	0.79-1.69
>20	30.0	24.0	1.77	0.65-1.70
History of LBP				
Yes	92.1	38.5	2.51	1.37-3.10
No	7.9	61.5	1.32	0.37-1.49
Daily computer using time(hr.)				
<3	53.2	66.1	1.29	0.74-1.36
3-6	21.8	27.4	1.33	0.68-1.44
>6	25.0	6.5	1.45	0.65-1.99
Waist rotation and bending				
Yes	66.3	46.5	1.67	0.78-1.51
No	33.7	53.5	1.02	0.69-1.38

Measurement of pain severity showed that the mean degree of pain severity in episodes occurred last year was 6±1. No differences were detected for pain severity among different age groups (P=0.720).

We observed that no educational program or instruction about back care has been run in the worksite, only 4% of persons had passed it in medical colleges outside of their workplace, and this was 2.3% for instruction of ergonomics. Meanwhile 23% of our study group had awareness about appropriate sitting and VDT using.

Among "pain positives", 17% had at least one medical management using physiotherapy (massage, LASER, heat, etc). Use of these modalities had no association with pain severity and patients' age (P=0.645)

Among LBP group, 22.8% (200 persons) had some sickness absence periods due to LBP. Mean time of disability for each episode in the group was 5.1 days, while all patients (100%) with LBP spent some days as "presenteeism" (i.e. presence at workplace despite partial disability).

We found that 54% of our population participated in regular exercise activities. This result did not associate with LBP occurrence.

After adjusting for sex and age we found increased age up to 40 years, increased weight, daily sitting work style more than 4 hours, daily computer use more than 5 hours also past history of LBP has a positive association with increased like hood of LBP, but male/female sex, time of employment, smoking, waist rotation, bending and daily computer using time less than 5 hours showed no association. (Table 2)

DISCUSSION

Several studies showed that administrative staffs are more at risk of LBP, which can be explained by seated position, the static nature of their activities, awkward postures, and inappropriate furniture [10-14]. However, this relationship is not always easy to establish because it is often difficult to assess pure occupational risk factors and joint effects [2].

In Iran, few studies have noticed office workers for estimating LBP prevalence.

Prevalence rates of LBP reported in available literatures including ours have some discrepancies. For example while the point prevalence in nurses was 82% [2], this result for another group of nurses reported as 69% [15]. Statistics received from other occupation also follow this reality [16-18].

In a survey carried out among office workers in an automotive industry in Iran, one-year prevalence of LBP was 19.7% [19] and in another study in Nigeria, the result was 38%. [20]. Also study in Netherlands and Finland as developed countries showed the rate of 34% and 19% respectively [21, 22]. Our annual prevalence (37.3%) was near these two latter studies.

In various occupations, LBP has been reported, as the most common musculoskeletal complains followed by neck and shoulder [15, 23]. In present research after low back problems, the most common points of pain were neck and knee respectively.

Ergonomic hazards are directly linked to musculoskeletal complains among office workers. Van Vuuren showed significant adjusted odds ratio for bending and twisting [24] and in findings of Ghaffari et al. the common risk factor were awkward positions [19]. Recent comprehensive review of literatures conducted by national academy of science noted that work in awkward postures (bending, twisting and heavy physical work) were associated with increase risk for occupational back disorders [25]. We found no association for awkward position and LBP. The reason for this is somewhat due to inappropriate tool for assessment of postures. Moreover, perhaps Precipitants noted only full bending and twisting.

The type of Sitting influences incidence of low back pain in administrative staffs [12]. In fact, the only ergonomic hazard we found with positive association was sitting more than four hours.

Low productivity, absenteeism, turn over, increased direct and indirect costs, decrease accuracy and low morale are directly related to aches and pain, vision problems and comfort levels in the computer intensive environment [26]. We found excess daily hours of computer using up to five hours did not associate with LBP. In our study group computer, using is intermittent and continuous use is not frequent in any shift. Moreover, daily time of computer using reported by participants did not represent the whole time usage and this may disturb our interpretations.

Low back pain is one of the most common reasons for long-term sickness absence [26] and is an important cause of disability in industrialized countries, [5] but little information has been reported from developing countries. Linton found that 15% of studied reported taking off the work because LBP [27].

In Ghaffari thesis, 3.3% of subjects had sickness absence [19]. We found that a great part of pain positives (34%) has some sick leaves. This may be attributed to sick pay schemes in Iranian governmental centers.

Several general risk factors are attributed to the incidence of LBP. As it is the case of our study, the association between advanced age and LBP was reported by several authors [28- 30]. The cause may be related to senile degeneration processes [31].

History of LBP is a predictor of later pain so it is important to have pre employment assessments [32]. Results of our research confirmed this.

Results of studies about relationship between physical activities and LBP are controversial. While some authors have indicated them as a risk factor [33], others resulted protective effects of these activities [2, 23, 34]. It seems that several factors interfere including activity nature and spine injuries. Our research showed no association between the two variables.

Association of smoking with LBP has been noted in several studies. For example, Omokhodion found that LBP was significantly associated with smoking in office workers [20]. Also in O′connor research in military basic trainers similar results were obtained [35]. It seems that smoking not only exhibits a positive association but also support a causal relationship [36]. A doubtful finding of our study was that a negative relationship was observed between cigarette smoking and occurrence of LBP. We think this finding is due to not reliable response of office worker to "Do you smoke or use other tobacco products?" and smokers preferred to deny smoking.

In our country there is little referral from general physicians to specialist. However, we observed that the most physicians whom had visited by pain sufferer were general physicians somewhat because of low costs. Additional reason is probably that Iranian people think that low back pain is a benign phenomenon. Of course, our general physicians have adequate experience in initial managing of LBP.

Some drawbacks existed in our study including:

- The questionnaire was based on self-administrated.
- No complete exclusion of participants from the study was performed (regarding some confounding factors

such as recreational activities, driving, person's job other than office working etc).
- Lack of valid tools for measurement of waist rotation and forward bending.
- No assessment of psychosocial factors such as personality and job satisfaction.
- Lack of another occupational group as "control".

CONCLUSION

We think LBP is prevalent in office workers and certainly, some general and occupational risk factors are attributed in this regard. Educational programs may have a valuable rule in LBP prevention. On the other hand, we saw some effects of low back pain such as absenteeism and medical consult are much more than similar studies. In practice, the results of this study can help to estimate low back problems, promotion of healthy lifestyle, ergonomic measurement and control, good posture and execution educational programs in office workers and consider resting periods during the work shift.

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