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# EFFECTS OF LOW BACK PAIN ON OFFICE WORKERS

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## ABSTRACT

***Background:*** Low back pain (LBP) is regular among office specialists and is the most widely recognized reason for business related incapacity in individuals under 45 years old. The etiology of LBP is broadly acknowledged to be multi-factorial. ***Objective:*** to evaluate the effect of work environment on low back pain. ***Methodology:*** A sample (about 40 participants) of office workers were collected (aged between 18 and 60 years and working full-time at least one year of experience in the current position) and asked many questions about LBP. The data in the filled written consent were recorded in a computer program, these data include: Individual factors included gender, age, marital status, educational level, frequency of regular exercise or sport, smoking habits, and number of driving hours a day. ***Results:*** The collected data showed that among all responders, 31.5 % suffered from LBP at the time of the survey, 39.2% and 44% presented with LBP within the previous one and 2 years respectively, and 56.1% of selected office workers experienced at least one LBP episode in their lifetime. Their demographic and personal characteristics as well as point, one-year, 2-year and lifetime prevalence of LBP. ***Conclusion:*** due to existing bureaucratic factors, in terms of public office workers' participation in research projects, our investigating team has considered it appropriate to select a representative sample of government clerks by utilizing the method of random cluster sampling.

**KEYWORDS:** Low back pain, office worker, Oswestry.

## 1. INTRODUCTION

Low back pain (LBP) is regular among office specialists and is the most widely recognized reason for business related incapacity in individuals under 45 years old.[1] The etiology of LBP is broadly acknowledged to be multi-factorial.[2]

Sitting for more than a large portion of a work day in mix with ungainly stances or much of the time working in a forward twisted position has been found to improve the probability of having LBP.[3,4] Poor workstation ergonomics has been appeared to essentially add to the improvement of LBP.[5] Different psychosocial issues, for example, high stress[6], low employment fulfillment, low social backing and exertion reward imbalance[7] likewise added to an expanded event of LBP. Clinical elements, are for example, scoliosis[8], low back muscle endurance[9], poor lumbar strength and anomalous trunk mobility[10], has been connected to expanded danger of LBP.[11,12]

Chronic low back pain (LBP) has been considered as a repeating human illness. So as to walk upright and hold that position, people apply expanding substantial weight on the lumbar region. LBP results from numerous variables (multifactorial malady), so it can't be overseen by a basic treatment.[13]

Low back pain is named intense if the length of time of pain is under 6 weeks, subacute if the span is between 6 weeks and 12 weeks, and incessant if the term is more than 12 weeks. Most low back pain goes on for 2 to 3 months. On the other hand, repeat is extremely regular.[14] Despite the fact that most repeats can be dealt with, 5 to 15% can't be dealt with, and the patients keep on encountering pain.[15] There are different reasons for low back pain. The most widely recognized reasons are the low back structure, biomechanical variables and backward changes in surrounding tissues, mental components, and different sorts of infections, metastatic osteosarcoma, and innate spinal variation from the normal.[16]

What's more, low back pain reasons changes in low back structure and surrounding tissues. Thus, the muscular strength, which are identified with the solidness of the storage compartment, are debilitated, and this reasons pain and useful confinements.[17] At the point when low back pain deteriorates, it limits physical exercises. When it gets to be unending, the cross area of the muscles encompassing the spine decreases and reasons neglect muscle atrophy.[18]

Lumbar instability is a typical indication furthermore one of the reasons for low back pain. It is typically brought on by a neuromuscular control issue as opposed to basic unsteadiness.[19] The meaning of lumbar segmental flimsiness is diminished firmness of the spinal movement sections. Past studies have shown that lumbar instability is connected with pain perhaps; and

it might be because of an imperfection in spinal fragment development control, prompting pressure of the neural structure.[20,21]

Trunk muscular strength may secure the spine amid every day exercises.[22] Shortcoming of the storage compartment muscles and poor solid continuance are additionally attributes of LBP.[23] The seriousness of trunk strong shortcoming or fatigability may be inspected utilizing isokinetic or isometric tests. Various studies have examined the distinction in trunk muscular strength and endurance between unending LBP patients and health subjects. Some reported subjects with LBP have fundamentally less solid quality and endurance than health subjects.[24] This may be clarified by LBP clients being unwilling to attempt amid the strength test because of pain or fear of injuries.[25]

## 2. METHODS

In this section, I will try to collect nearly all self-administered questionnaires for LBP from office worker that work full time and for a long period of time daily and design a computer program to detect the symptoms, diagnosis, degree of severity of LBP, physical examinations and treatment of LBP.

A sample (about 40 participants) of office workers were collected (aged between 18 and 60 years and working full-time at least one year of experience in the current position) and asked many questions about LBP.

Participants were excluded if they reported spinal, intra-abdominal or femoral surgery in the past year, a history of trauma or accidents or had been diagnosed with rheumatoid arthritis, ankylosing spondylitis, systemic lupus erythymatosus or osteoporosis. Those who had any contraindications for physical tests, such as cardiovascular diseases or severe pulmonary diseases, were also excluded.

A written informed consent will fill by the participants, and recollected after three days.

The data in the filled written consent were recorded in a computer program, these data include: Individual factors included gender, age, marital status, educational level, frequency of regular exercise or sport, smoking habits, and number of driving hours a day.

Work-related physical factors included current job position, number of working hours, and years of working experience. Respondents were asked about the frequency of using a computer, performing various activities during work, and rest breaks.

The questionnaire also asked respondents to self-rate the ergonomics of their workstations (desk, chair, and position of monitor) and work environment conditions (ambient temperature, noise level, light intensity, and air circulation). Psychosocial factors were measured by the Job Content Questionnaire.

The Oswestry Low Back Pain Disability Index (Appendix A) is a 10-items self-assessing questionnaire, each item contains 6 levels of answers that can be scored from 0 to 5. These items are: pain, personal care, lifting and moving objects, walking, sitting, standing, sleep disorders caused the low back pain, sex life, social life, and traveling.

***Data analysis***

We use the SPSS software for Windows (Version 14) to conduct the statistical analysis with a significant threshold set at $p < 0.05$, or non-significant set at $p > 0.05$.

P-values are the probability of obtaining an effect at least as extreme as the one in your sample data, assuming the truth of the null hypothesis. Quantitative variables were described using means, standard deviations and limits. Qualitative variables were described using proportions and percentages.

## 3. RESULTS

Among 40 male that potentially eligible subjected; who were invited to take part in the study, they provided with a self-report questionnaire and randomly distributed. The trial started in November 2015 and concluded in December 2015.

The collected data showed that among all responders, 31.5 % suffered from LBP at the time of the survey, 39.2% and 44% presented with LBP within the previous one and 2 years respectively, and 56.1% of selected office workers experienced at least one LBP episode in their lifetime. Their demographic and personal characteristics as well as point, one-year, 2-year and lifetime prevalence of LBP are shown in Table 1.

\Based on the mean age of the sample (approximately 39 years), participants' age was classified in two categories (≤39 and ≥39 years) and their BMI was divided into 2 groups of

below normal to normal (≤25) and above normal (≥25) levels. Significant differences were also recorded in their lifetime LBP prevalence (P<0.001) between individuals with BMI ≤ 25 (56.2%) and those with BMI ≥ 25 (70.3%). The classification of the respondents exercising habits included the less than 4x/month, 1–2x/week, and ≥3x/week categories. No significant differences were calculated among all exercising groups and across all prevalence periods. Descriptive statistics of sleep disturbances between healthy participants and those suffering from LBP were recorded at all 4 prevalence periods examined in this study and presented in Table I. Significant differences among categories of sleep disturbances were found for all prevalence periods.

The intensity of pain at the time of the survey as well as the duration of each recurrent episode was recorded. Results showed 11% of respondents rated their pain as severe or unbearable, whereas > 50% rated it as mild to moderate. In addition, the majority (43%) of the recurrent episodes lasted from one day to one week. Work ergonomic and psychosocial characteristics of office workers as well as point, one-year, 2-year, and lifetime prevalence of LBP are presented in Table 2. Ergonomic and psychosocial exposures such as body position in sitting, distance of computer screen from clerk's body, adjustable back support, job satisfaction, work stress during last month, and anger in the last 30 days displayed significant values for some of the prevalence periods.

Results showed that significant predictors for point prevalence were the clerk's body position while sitting and anger during the last 30 days. In addition, significant individual, ergonomic, and psychosocial risk factors for predicting one-year prevalence were the office worker's body distance from the computer screen, job satisfaction, and anger during the last 30 days. Furthermore, the significant determinants for 2- year prevalence were adjustable back support, job satisfaction, and anger during the last month. Finally, significant predictors for lifetime prevalence were age, gender, BMI, body distance from computer screen, sitting time > 6 hours, repetitive work, and anger during last 30 days.

**Table 1: Showed the demographic and personal characteristic of selected office worker and their LBP prevelance.**

| | Study sample | | LBP point prevalence | LBP point one year prevalence | LBP point two years prevalence | LBP lifetime prevalence | *P value* |
|---|---|---|---|---|---|---|---|
| | No. | % | % Pos | % Pos | % Pos | % Pos | |
| Gender | | | | | | | |
| Male | 40 | 100 | 31.5 | 39.2 | 44 | 56.1 | |
| Age Gr. | | | | | | | |
| ≤ 39 | 27 | 67.5 | 30.5 | 37.4 | 41.8 | 56.2* | 0.102 |
| ≥ 39 | 13 | 32.5 | 36.0 | 38.2 | 35.3 | 71.2* | |
| BMI | | | | | | | |
| ≤ 25 | 25 | 62.5 | 32.5 | 76.2 | 41.7 | 56.2 | < 0.001 |
| ≥ 25 | 15 | 37.5 | 32.9 | 71.9 | 42.3 | 70.3 | |
| Smoking Status | | | | | | | |
| Smoker | 15 | 37.5 | 33.5 | 39.0 | 41.6 | 65.7 | 0.095 |
| Non-Smoker | 25 | 62.5 | 32.7 | 36.8 | 42.0 | 59.1 | |
| Exercising | | | | | | | |
| Less than 4x/month | 18 | 45.0 | 32.5 | 39.7 | 41.9 | 64.1 | 0.108 |
| 1-2x/week | 13 | 32.5 | 34.7 | 36.9 | 41.8 | 63.0 | |
| ≥3x/week | 9 | 22.5 | 30.7 | 31.9 | 35.9 | 52.6 | |
| Sleep Disturbances | | | | | | | |
| None | 21 | 52.5 | 46.5 | 60.3 | 69.2 | 90.8* | 0.006 |
| Sometimes (1-2x/week) | 11 | 27.5 | 66.3 | 68.4 | 70.8 | 93.9* | |
| Many times (≥3x/week) | 8 | 20.0 | 82.1 | 79.5 | 79.5 | 97.1* | |
| Almost no sleep | 0 | 0 | 34.3 | 21.1 | 21.3 | 99.5* | |

**Table 2: Work ergonomic and psychosocial characteristics of selected office workers and their LBP prevalence.**

| | Study sample | | LBP point prevalence | LBP point one year prevalence | LBP point two years prevalence | LBP lifetime prevalence | *P value* |
|---|---|---|---|---|---|---|---|
| | **No.** | **%** | **% Pos** | **% Pos** | **% Pos** | **% Pos** | |
| sitting time | | | | | | | |
| ≥ 6 hrs | 31 | 77.5 | 41.4 | 47.3 | 52.8 | 75.8 | 0.148 |
| ≤6 hrs | 9 | 22.5 | 46.2 | 47.5 | 50 | 66.2 | |
| Body position in sitting | | | | | | | |
| bent ≥2 hrs | 33 | 82.5 | 32.5 | 37.1 | 41.7 | 59.2 | 0.019 |
| Not bent | 7 | 17.5 | 35 | 39.5 | 42.3 | 71.3 | |
| Chair type | | | | | | | |
| Back support | 25 | 62.5 | 33.5 | 39.0 | 43.6 | 61.7 | 0.793 |
| No back support | 15 | 37.5 | 32.7 | 34.8 | 39.0 | 62.1 | |
| Body distance from computer screen | | | | | | | |
| ≤ 50 Cm | 28 | 70 | 32.5 | 36.7 | 41.9 | 56.1 | 0.026 |
| 50-100 Cm | 12 | 30 | 34.7 | 43.9 | 46.8 | 66.0 | |

## 4- DISCUSSION

This cross-sectional investigation attempted to examine the prevalence of LBP among office workers in different time periods in order to describe the acute and chronic occurrence of LBP. The results have shown that the prevalence of LBP increases from 31.5% to 39.2%, 44%, and 56.1% at point, one-year, 2-year, and lifetime respectively. Most epidemiological studies have only examined the 12-month LBP prevalence in office workers and reported comparable results.[26, 27] Although the design in most of these studies is also cross-sectional which establishes causation uncertain, the present investigation might provide more information on the estimate of LBP prevalence than other epidemiological studies since it considers more time periods.

Among the individual risk factors, gender, age, BMI, smoking, and exercising habits were examined (Table I). Significant differences were detected between the groups of gender and BMI and for only the lifetime prevalence of LBP. Females and individuals with greater than normal BMI displayed higher percentages of LBP lifetime prevalence in accordance with other studies.[28, 29] Smoking and exercising habits were not significant predictors in this present study. Regarding exercising habits only a small proportion, 20%, of our sample participated in regular exercise of equal or greater than 3 times per week which suggests that office clerks were mostly non-exercising individuals. Other studies have reported that both smoking and exercising habits were either weak predictors or non-predictors of LBP prevalence[30, 31] Significant differences were also calculated among some of the ergonomic factors across one year, 2-year, and lifetime prevalence periods (Table 2). Individuals with forward bent body position for more than 2 hours daily presented with a significantly higher proportion of LBP lifetime prevalence (71.6 vs. 59.6%) and office clerks whose body distance from the computer screen was between 50–100 cm appeared to have a greater percentage of LBP prevalence at one year (43.7 vs. 36.5%), 2-year (46.7 vs. 41%), and lifetime (66.7 vs. 56.7%) periods. Apparently, the forward bent body position increases spinal loading and contributes to LBP.[32] The distance from the computer screen to the operator's body might also be an indirect factor for body adjustment to a non-neutral position which stresses the lumbar region and produces pain. Additionally in this study, the adjustable back support is associated with decreased rates of one-year (33.2 vs. 41.1%) and two-year (37.7 vs. 45%) prevalence of LBP in accordance with other studies.[33, 34] There were no significant differences between sitting time categories of office clerks, although sitting time >6 hours was a significant predictor for lifetime prevalence of LBP. Other studies have also confirmed

that sitting for more than 3 hours daily could be a risk factor for LBP.[35, 36] Regarding sitting, biomechanical research on risk factors has identified significant ergonomic predictors to be the trunk angle as well as time in this position[37] and twisted trunk posture. Our study has neither examined these factors nor has it been a biomechanical investigation. Perhaps questions on twisted trunk posture should be included in future self-reported questionnaires.

### *5- Conclusion and recommendation*

In summation, certain limitations appear to be present in this research. Generally, although this study is the first to examine risk factors and the prevalence of LBP in public office workers, its results may not be generalized to include office workers in the private sector. Future research might include private office workers and provide additional information. Furthermore, due to existing bureaucratic factors, in terms of public office workers' participation in research projects, our investigating team has considered it appropriate to select a representative sample of government clerks by utilizing the method of random cluster sampling. Perhaps in future research, other selection methods may be more suitable to have different bureaucratic processes with great caution because they express only association and not causation between the risk factors and prevalence of LBP.

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