

# Back Pain and Associated Risk Factors

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## Abstract

**Background:** Musculoskeletal pain is a major health concern that is managed by physiotherapists across the country. Over the past decade, with increased urbanization, advances in technology and an increase in sedentary life styles there has been an advent in risk factors related to the incidence of musculoskeletal problems particularly back and neck pain. In order to better manage and address these problems within the current healthcare delivery system, it is important to objectively determine the spectrum of MS pain, their prevalence and associated lifestyle risk factors in an urban population.

**Objective:** To determine the prevalence of back and neck pain and its related risk factors in an urban population.

**Methodology:** A survey questionnaire was used to obtain data regarding prevalence and related risk factors of such pain from the participants.

**Results:** 46% of the sample reported musculoskeletal pain: low back (36%), neck (35%) followed by, Upper back (13%), arms (7%), legs (7%) and head (2%). Participants living in urban slums reported more pain (58%) than those living in urban areas (44%). Interestingly, pain prevalence was greater in young adults (more than 50%) than the in elderly, and pain was not associated with risk factors, like sleeping surface used, pillow, sleeping position, and medications.

**Conclusion:** Musculoskeletal pains, predominantly back pain remain a major problem. A poor association between pain and traditional risk factors, such sleeping surface, use of pillow, sleeping position was found.

**Keywords:** *Musculoskeletal pain, Neck Pain, Back pain, Prevalence, Risk factors*

## Introduction

The integrity of the core or spinal musculoskeletal framework allows humans to perform day to day tasks in an efficient and skillful manner. With rapid Urbanization and advancing technology undue stresses are placed on these enabling structures leading to back pain and instability. This is a global health problem with a 75% prevalence of musculoskeletal pain, of which neck and back pain constitutes 37% and 39% respectively.<sup>1</sup> Pain is one of the main reasons for seeking medical attention as it primarily and significantly interferes with activities of daily living, which consequently causes worry, emotional distress and undermines confidence in a person's own health.

The point prevalence of LBP is 28.5% found in Asian countries. The prevalence of back pain in Indian population range from as low as 6.2% to high as 92% depending upon the population under study.<sup>1</sup> More than 100 risk factors for LBP have been identified ranging from individual factors like age, gender, BMI to work related occupational factors to psychosocial, lifestyle and environmental factors like sleep cycle, stress etc. In majority of cases, a combination of individual and work-related as well as non-work-related factors is likely to contribute to the development of such pains.<sup>2</sup>

Back and neck pain have been suggested to contribute significantly to a lack of sleep. A survey conducted by the National Sleep Foundation found that adults on average sleep for less than seven (7) hours per night, and that there was a decrement in quality of

life, social life and several psychological parameters in people that suffered from a lack of sleep.<sup>3</sup> Furthermore, it has also been reported that sleep deficiency resulted in loss of work production, increased sick days, greater absenteeism, loss of productivity and higher injury rates.<sup>4,5,6,7</sup>

Typically, it is observed that people with back and neck pain report a disturbance in their sleeping patterns, which then sets up a vicious cycle of pain – lack of sleep – more pain. A variety of treatment options are available for such pain, along with advice that ranges from the use of specific mattress, the type of pillow, sleeping position, room temperature etc. Significantly, in a comprehensive survey of orthopedic surgeons, 95% believed that a mattress played an important part in the management of low back pain and 75% recommended firm or hard mattresses for the relief of back pain.<sup>8</sup> Similarly, patients are advised on the position one should sleep in, the ambient temperature of the room etc.

To compound the problem manufacturers of mattresses make false claims using medical jargon, usually with support from the medical fraternity, to the relative health benefits derived from using selected mattresses. These claims are also largely unsupported and not based on empirical research. Recent studies found that some mattress ads depict how the contour of the bed surface conforms to that of the body. However, the data suggests that there is no reliable evidence that the spinal curvature changes when sleeping on a hard or soft surface.<sup>9,10</sup> Moreover, others have reported that changes in spinal curvature in the lying position does not concurrently increase or decrease EMG activity, and thus would not impact the level of spinal discomfort.<sup>10</sup>

Clinicians generally hypothesize, albeit with limited or no evidence, that different sleeping position and surfaces generate different contact pressure points, and consequently will generate differential stress areas on the body surface and or spine. The three basic sleep positions (supine, side, prone) thus, require unique qualities in the support and softness of mattress to dissipate focused areas of pressure and spinal stress. However, it is observed that typically a person who suffers from pain will adopt a unique sleeping position that is individualistic, and which will minimize the pain and discomfort.<sup>11, 12</sup>

A review of the literature revealed a paucity of research on the prevalence of back pain and associated risk factors such as sleeping surfaces, positions, etc., particularly in the Indian context. In addition, given the lack of evidence with regards to risk factors that patients and more importantly clinicians associate with back pain, the objectives of this study were to (1) determine the prevalence of back and neck pain in an urban population, and (2) determine the commonly associated risk factors, such as sleeping positions, surfaces, etc. with back and neck pain in an urban population.

## **Method**

### *Identification and selection of trials*

1100 Subjects living in and around Delhi 18 years and older were asked to complete a self-administered questionnaire. The sample was a convenience sample. Subjects residing in the urban slums were recruited as volunteers, while those residing in urban areas were recruited from memberships of resident welfare associations and clinical OPD of Amar jyoti charitable trust.

Subjects who were pregnant, suffered from neurological conditions and or any other diagnosed systemic illness were excluded from the sample.

### *Data extraction and analysis*

#### **Survey Instrument**

A questionnaire was developed. Each question was scored on a nominal scale. The following sub-scores were derived:

**Prevalence:** Prevalence of urinary incontinence was determined by calculating the number of 'yes' on question 7.

**Risk factors:** Questions 2, 3, 4 and 5 documented the Risk factors associated with spinal pain. In addition, the degree of risk is determined by adding the no of subjects who answered the above questions related to risk factors in the affirmative.

**Awareness:** Awareness was measured using question 11. This was an indirect measure of awareness to interventions and their use.

**Study design-** Descriptive study design

**Procedure-**

The questionnaire was administered by volunteers who were recruited from the community. They were trained in its administration by the principal investigators (PS) in the procedures on how to administer the questionnaire. The volunteers went to their assigned urban slum area and had a one to one interaction with people of the community at their respective homes. They explained the subjects about the survey and instructed the method to fill the questionnaire. In urban areas the Investigator themselves went to administer the questionnaire at various resident welfare areas and societies. The investigator instructed the subjects in the same way as the volunteers did in urban slums.

**Ethical clearance-** Amar Jyoti Institutional Review board- Ethical Committee.

**Results**

1) Demographic Data

1100 subjects including 200 from urban slums and 900 from urban areas participated in the study with age range 18-75 years, mean age 36 years.

2) Prevalence

It was observed that 46% of subjects sampled were having spinal pain of which 58% of subjects were living in urban slums, while 44% in urban areas.

It was also observed that the prevalence of spinal pain decreases as the age advances (figure 1).

Insert Figure 1 here

3) Risk for spinal pain-

As seen in figure.2, 3, 4 and 5 it was observed that subjects that the pain and no pain population showed almost similar results.

Insert figure 2 here

Insert figure 3 here

Insert figure 4 here

Insert Figure 5 here

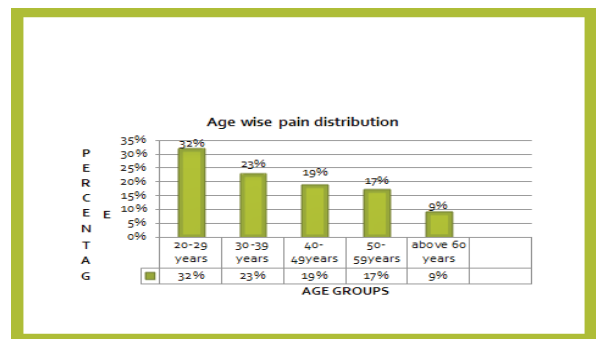


Figure 1: Showing age wise pain distribution

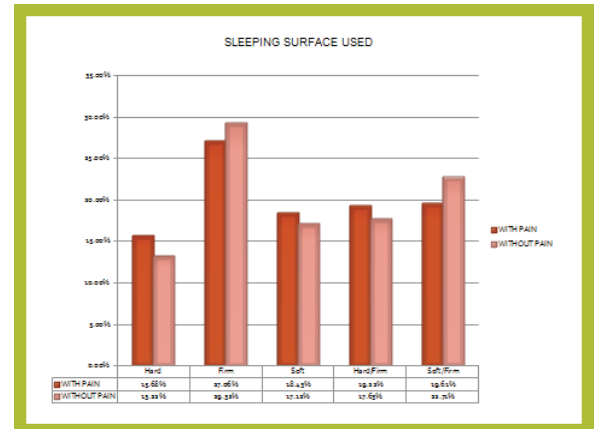


Figure 2: Percentage of sleeping surface used by the population

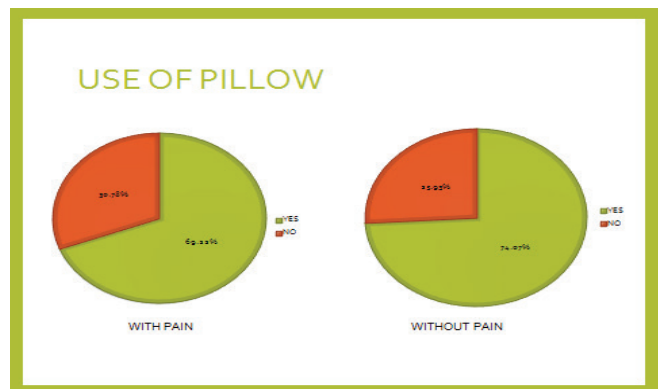


Figure 3: Percentage of pillow use by the population

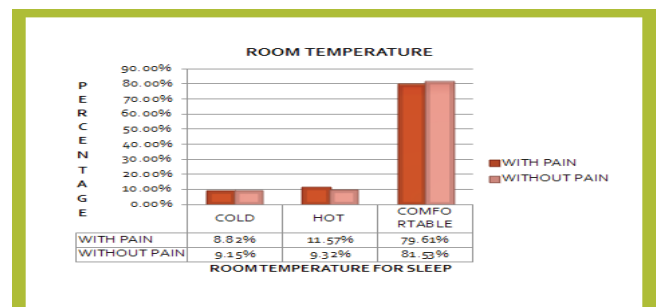
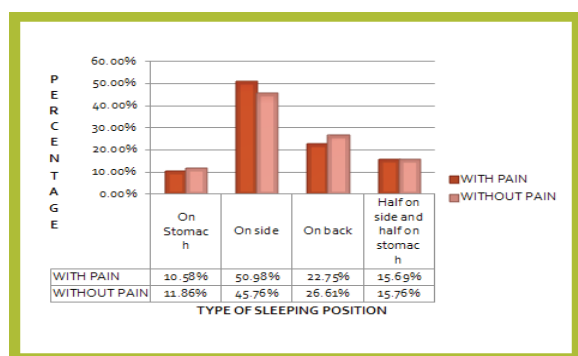


Figure 4: Percentage of room comfort reported by the population



**Figure 5: Percentage of sleeping position used by the population**

### Discussion

The prevalence of musculoskeletal pain in our study was observed to be 54%, which is much higher as compared with the other studies<sup>13, 14, 15,16</sup>. In all these studies, the prevalence ranged between 15 and 25.9%. However, a study done in the general community in Cuba reported close results with a much higher prevalence of 43.9%.<sup>17</sup>

Our study reported almost similar prevalence among both genders with females having pain slightly more than males; however other studies reported that Females are more affected than males.<sup>14,15,18</sup>

Pain was more prevalent in the urban slums with females more affected than males when compared with urban areas, more than half of the population in urban slums reported presence of pain. Similar results were found in a study by Chopra *et al.* the study reported urban prevalence of musculoskeletal (MSK) disorders. Another study on urban slums by Pingle and Pandit reported Prevalence of Musculoskeletal disorders as 18% with more in females (28.2%) as compared to males (8.1%).<sup>14</sup>

Prevalence of pain was seen more amongst young adults as compared to the older people. The reason may be that the younger population is involved more in energy intensive jobs or the ones requiring maintenance of typical postures for prolonged times.<sup>19</sup> but as the age advances the physical stress of work decreases as people tend to settle in more comfortable jobs or retire. It is also speculated that older people also tend to get habituated or accept chronic aches and pains as a part of normal aging, which may be the reason for less reported pain in this age group. However studies report that prevalence increase

till 50 years and then decreases.<sup>13,14</sup> The latter results were similar to our study as the prevalence decreased in the older age group. Only one study reported that the prevalence increased markedly with age.<sup>18</sup>

Our study is first of its kind to report pain in relation to sleeping surface characteristics. Maximum pain was reported with the usage of firm surface; however the interesting part of the result is, population without pain also maximally used the firm surface, suggesting that the firmness can be cause or reliever of pain or might not be related at all.<sup>20</sup> Though literature suggests that mattress of medium firmness improves pain and disability among patients with chronic non-specific low back pain. Levy and Hutton cited that in daily practice, physicians are frequently requested to counsel on the characteristics of beds and mattresses to lessen back pain. In a survey of orthopaedic surgeons, 95% believed that mattresses played a part in the management of low-back pain, with 76% recommending a firm mattress.<sup>21</sup> However, evidence supporting this advice is lacking. The effect of mattress characteristics on low-back pain has been analyzed in a limited number of studies.<sup>22</sup>

As, cited in the book “BACK AND BED Ergonomic Aspects of Sleeping” by Bart Haex When sleeping on too firm a mattress the spinal column is supported incorrectly; in the case of a lateral position, only places with a large body width—the shoulders and the hip zone—will be supported. The lumbar region will bend down, especially in people who have a more pronounced contour (e.g., women). In supine position the pelvis will cant forward under the influence of tension in the ilio psoas muscle; after muscle relaxation it cants backward as is the case on soft mattresses. The consequent flattening of the lordosis is less pronounced and more harmful.<sup>23</sup>

These results null and void the typical question asked in the clinical assessment about the mattress used. Rather the type of mattress suggested by the clinician should be based on thorough physical assessment.

Though our study did not enquired for the type of pillow, but usage was asked and it was noted that the results were similar for population with and without pain. A similar study asked the respondents about the type of pillow and the usage<sup>24</sup>. They concluded that ideal pillow should be soft and with good support for the neck

lordosis. A specially selected and individually tested pillow with good shape, comfort and support to the neck lordosis can reduce neck pain and headache and give a better sleep quality. They further reported that the usage is entirely an individualistic decision and does not affect the results.

The results suggested that subjects in the urban slums having pain were not using pillow whereas, subjects in the urban areas as result of affordability and accessibility used pillow. They also reported use of customized pillows. However, the results also indicate that the non-usage and usage of pillow was associated with pain. According to Haex, B, the pillow use depends on the condition of the patient, their neck posture and sleeping position.

This study related sleeping position with pain symptoms and report that maximum population chooses the side lying position for sleeping. These results are similar to study by Gordon *et al.*, which also state maximum usage of side lying position. However the present study reports that the pain population also uses side lying position, on the contrary the study by Gordon *et al* stated that the position not only reduces pain but also improves the sleep quality. Hence, is considered the best sleeping position for minimizing waking symptoms and maximizing sleep quality.

### Conclusion

Musculoskeletal pains, predominantly back pain remain a major problem. A poor association between pain and traditional risk factors, such as and its prevalence tends to decrease with age, No association was found between pain and risk factors like sleeping surface, use of pillow, sleeping position etc.

**Conflict of Interest:** None

**Source of Funding:** Self

**Ethical Clearance:** Not Applicable

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