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Epidemiology of low back pain: A literature review

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Abstract

Today's Science have done lot things easy, they produce human robot but can't cure low back pain by a click. That is why in dynamic life, threatening of lower back pain increasing day by day. It crosses the limit to different age, sex, occupation and habits. Now it is time think about it. We aim to draw attention on epidemiology of low back pain in globally and India. Systematic review was adopted as design of the study. We adopted scientific electronic databases; PubMed, Embase, Medline, Google Scholar, Google Advance Search, Psyc INFO, ROAJ, DOAJR, Cochrane Database, ISI Web of Knowledge, Web of Science and critically analysed the entire relevant article according to the nature of this study. On basis of the information, we found that wideness of low back pain is unequal percentage throughout the globe due to factors like socio-economic conditions, nature of activity, habits etc. In India near about 8% peoples years lived with disability (YLD) due to low back problem and 4.6% peoples Disability-Adjusted Life Years (DALYs) in musculoskeletal disorder in India. Rate of change DALYs in respect of low back pain has been 1.2% to 2.3% between years 1990 to 2016. More multidimensional and number studies will require further investigate for accurate epidemiological structure of low back pain in world and India.

Keywords: Low back pain, epidemiology, India

1. Introduction

Low back pain causes more disability around the globe than any other condition, and accounts for a third of all work related disability, according to new research. Researchers found that almost one in 10 people (9.4 per cent) worldwide suffers from low back pain. The prevalence of low back pain was highest in Western Europe, followed by North Africa and the Middle East, and lowest in the Caribbean and Latin America published in journal Annals of the Rheumatic Diseases [1].

2. Methods

2.1 Acquisition of evidence

Researchers collected scientific evidences through electronic databases; PubMed, Embase, Medline, Google Scholar, Google Advance Search, Psyc INFO, ROAJ, DOAJR, PED ro, CINAHL, Cochrane Database, ISI Web of Knowledge, Web of Science and critically analysed the entire relevant article according to the nature of this study.

2.2 Inclusion and exclusion criteria

Studies related to the objective of this paper were included in this project whereas studies which were not directly matched with the concept of analysis were excluded from the process.

2.3 Selection procedure of review articles

In the first attempt, a total 113 articles were assessed on the basis of eligibility criteria. Out of which only 41 papers fulfilled the objective of this study. Details selection procedure adopted for this study is presented in the Figure-1.

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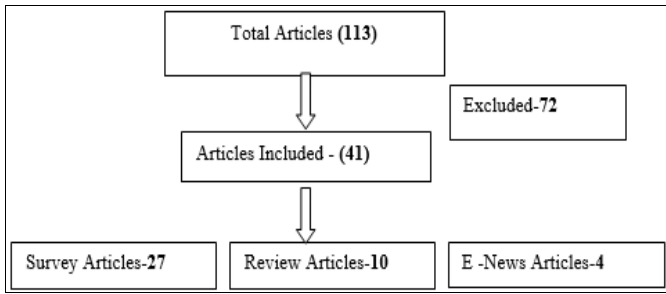


Fig 1: Selection procedure of articles

3. Epidemiology

LBP represents a major social and economic problem. The prevalence of CLBP is estimated to range from 15 to 45% in French healthcare workers; the point prevalence of CLBP in US adults aged 20–69 years old was 13.1%. The general population prevalence of CLBP is estimated to be 5.91% in Italy. The prevalence of acute and CLBP in adults doubled in the last decade and continues to increase dramatically in the aging population, affecting both men and women in all ethnic groups. LBP has a significant impact on functional capacity, as pain restricts occupational activities and is a major cause of absenteeism. Its economic burden is represented directly by the high costs of health care spending and indirectly by decreased productivity. These costs are expected to rise even more in the next few years. According to a 2006 review, the total costs associated with LBP in the United States exceed (\$100 billion per year, two-thirds of which are a result of lost wages and reduced productivity [2]. The prevalence of back pain was, respectively, 64.8%, 19.8%, 69.5%, 40.6% and 36.2% in Bangladesh, India, Nepal, Pakistan and Sri Lanka. Lack of physical activity is cause to high percentage lower back pain in all the above countries [3]. Globally, lower back pain affects more than 540 million people and the condition has doubled in the last 25 years. The prevalence of the condition is expected to continue to increase with an ageing and increasingly obese population [4]. Prevalence (n = 30,146) and back pain intensity conditioned on prevalence (n = 8,815) for respondents 50 years and older in the six SAGE countries. Overall, the self-reported prevalence of back pain in the past month was 30%. Prevalence was highest in the Russian Federation (56%) and lowest in China (22%). Comparing the proportion of respondents in each intensity group, India had the highest proportion of respondents in the high intensity group (12%) and China and South Africa had the lowest (4%). In the pooled analysis, 8% of respondents were in the high intensity group, compared with 77% and 15% in the moderate and low intensity groups respectively. Mexico had the highest prevalence in the low intensity group (22%) and Ghana and India had the lowest (9%) [5]. Six hundred and sixty patients underwent evaluation and treatment in the PT/OT outpatient clinic from July 2015 to June 2016. Out of which, 155 patients (23%) presented with chronic LBP. Eighty nine patients (57%) were female patients, and 66 (43%) were male patients [6].

There is strong evidence that low-back disorders are associated with work-related lifting and forceful movements. Among 18 reviewed epidemiologic studies, 13 were consistent in demonstrating positive relationships. Those using subjective measures of exposure showed a range of risk estimates from 1.2 to 5.2, and those using more objective assessments had odds ratios (ORs) ranging from 2.2 to 11. Studies using objective measures to examine specific lifting activities generally demonstrated risk estimates above three and found dose-response relationships between exposures and outcomes [7]. Low back pain frequency was found to be 40.9%. This rate increases with age. Abandonment of moderate level physical activity and traumas such as slipping on ice and falling down the stairs were identified as associated factors [8]. Patients over 18 years of age with a first episode of radiating low back pain, Incidence and prevalence, clinical course of illness, initial diagnoses established by the general practitioners (GPs), and treatment strategies. Incidence was 9.4 and mean prevalence was 17.2 per 1000 person years. In total, 390 patients had 1193 contacts with their GPs [9]. One study in Northern Queensland, the 72-month period-prevalence of LBP was 64.6%. Nearly half (46.9%) had experienced pain for

over 2 days, 38.8% suffered LBP that affected their daily lives, and 24.5% had sought medical treatment. The prevalence of LBP ranged from 45.5 to 77.1% ($p = 0.004$) [10].

It has sources which are inherent to the work place or organization although the worker also brings into the work place some level of pre-disposed factors to stress. The influence of job stress on musculoskeletal disorder is found successfully by conducting a survey using 4 and 5 point Likart scale questionnaire on 686 employees [11].

Among 1081 subjects, 829 (77%) provided full details at the one year follow up. Psychosocial work demands and high levels of individual psychological distress were found to have a common effect across sites. Psychological distress was associated with a doubling of the risk of reported pain (odds ratio=2.1, 95% confidence interval 1.6 to 2.7), while aspects of job demand, poor support from colleagues, and work dissatisfaction were all associated with increased odds of reported pain onset of between 1.4 and 1.7. These effects were almost all common across the four regional pain sites [12].

Some still dispute the importance of these factors, especially relative to non-occupational causes. This paper addresses the controversy with reference to a major report recently commissioned by the US Congress from the National Research Council (NRC) and Institute of Medicine (IOM) (2001). The available epidemiologic evidence is substantial, but will benefit from more longitudinal data to better evaluate gaps in knowledge concerning latency of effect, natural history, prognosis, and potential for selection bias in the form of the healthy worker effect [13]. Globally 540 million people suffer from low back disability that is near about 7.105%. Last decades increased rate is high [14].

3.1 Epidemiology of lower back pain in India

India is subcontinent part of Asia, a developmental country in relation to economic aspect. In perspective health, India reduce-mortality rate, prevalence communicable diseases, percentage of malnutrition in last few decades. According health different report stated that Indians are increase their life potentiality and expectancy. But few drawbacks regarding health due to in socio-economic stratification that leads to play quality of health status. One part of the people in India still suffers from different health hazards. According to ICMR (Indian Council of Medical Research) report,2017 non-communicable diseases increased 30.5% to 55.4% between in year of 1990 to 2016 of all three major disease groups to total DALYs(Disability-Adjusted Life Years)in India. The other disease two groups are 1) Communicable, maternal, neonatal, and nutritional diseases 2) Injuries [15].

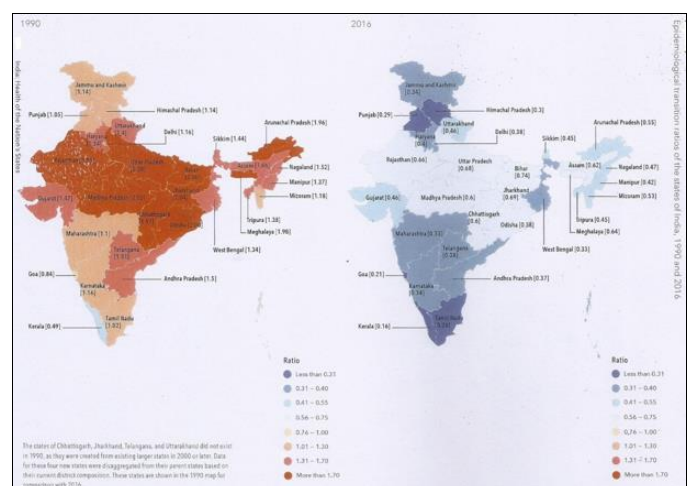


Fig 2: Indian Council of Medical Research (ICMR) report,

Epidemiological Transition Ratio (ETR) of diseases, 2017

Epidemiological transition ratio (ETR) is defined as the ratio of DALYs caused by Communicable diseases to those caused by non-communicable diseases (NCDs) and injuries. A ratio is greater than one indicates a higher burden of Communicable diseases than non-communicable disease and injuries, while a ratio less than one

indicates the opposite. The lower the ratio, the greater the contribution of non-communicable disease and injuries to a state's overall disease burden. The proportion of DALYs caused by NCDs and injuries has increased heavily across the country since 1990, and in 2016 accounted for the majority of premature death and disability for all states – a major shift in drivers of health loss. The states with ratio 0.56–0.75 were considered as having the lowest ETL, those with ratio 0.41–0.55 as lower-middle ETL, those with ratio 0.31–0.40 as higher-middle ETL, and those with ratio 0.30 or less as highest ETL in 2016 [15].

According to IMCR report near about 8% peoples all state of India, and females are slightly high than male Yearly lived with Disability (YLD) low back pain. Yearly lived with Disability (YLD) low back pain ranked 2nd place in Empowered Action Group states (Uttar Pradesh, Chhattisgarh, Madhya Pradesh, Odisha, Jharkhand, Bihar, Rajasthan, Uttarakhand) and other states (Haryana, Karnataka, Gujarat, Andhra Pradesh, West Bengal, Jammu Kashmir, Punjab, Maharashtra, Tamil Nadu, Telengana, Delhi, Union Territories, Himachal Pradesh, Goa, Kerala), 3rd in North East state (Assam, Tripura, Meghalaya, Arunachal Pradesh, Manipur, Mizoram, Nagaland, Sikkim) among 15 non-communicable diseases. It showed that higher proportion of YLD among females than among in all three states groups in 2016 [15].

In report 2016 described that 4.6% people DALYs in musculoskeletal disorder in India. Change of the rate of DALYs in case of lower back pain is almost double in 1990 (1.2%) and 2016 (2.3%). So report indicated that health issue on low back disorder increase day by day in India. And reports said that low back disorder rank in 20th in 1990 and reduce the rank came 12th in 2016 in respect of all diseases. LBP injuries caused 66.1% more DALYs in 2016 than they did in 1990. Hence also females are highly prone to DALYs in LBP (2.7%) than males (1.9%). DALYs due to LBP in other states (2.7%) is highly in respect of rest two regions of the state-EAG and North East (1.9%). The State like West Bengal (.91) fall higher percentage in other states in case of low back pain. 55-59 years aged people are highly potentiality to suffer LBP in West Bengal DALYs with 1.74 [15].

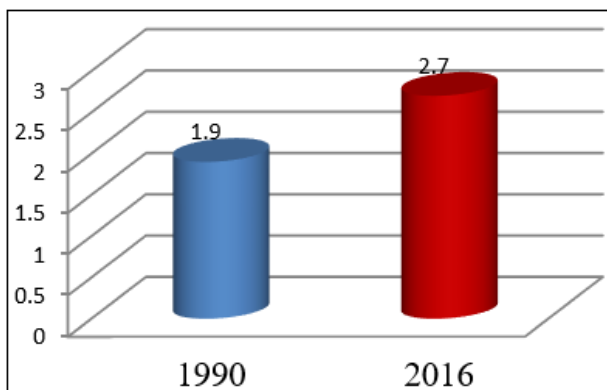


Fig 3: Rate of change in DALYs 1990-2016 of lower back pain

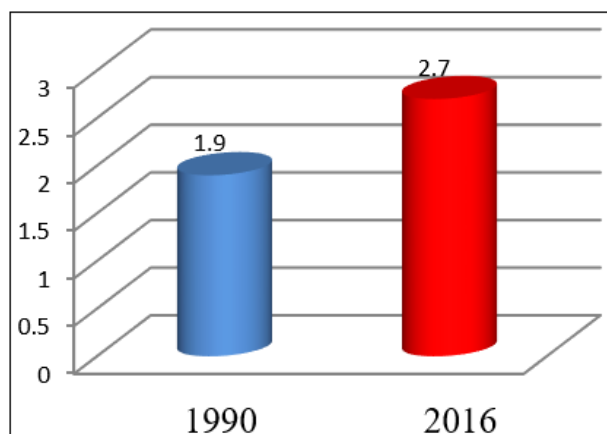


Fig 4: Compare Male and female DALYs 1990-2016 of lower back pain

One study found that LBP is precipitated by studying for >5 hours on an average ($p < 0.05$). The LBP prevalence was 42.4% per year and 22.8% per week of coaching institutes of Indian Administrative Service aspirants and medical postgraduate aspirants in Delhi from August to November 2014 [16].

QI Spine Clinic's World Spine Day 2017 Insights Report, shows that people tend to complain of lower back pain. 73% of the people are treated for lower back pain while 13.5% complain of upper and lower back pain making it the second most back problem suffered by the people to this day. Neck - upper back pain and neck pain accounts for 6.2% and 4.3% respectively. The treatment rate in women is 8% lower as compared to men but men delay their treatment more than women. The ratio between women and men is 46:54. The report also finds Herniated Disc (Slipped Disc) as the most common condition with 41.2% of the total population suffering from back and neck conditions falling in this bucket. 35% of the population suffers from mild disc bulge or some form of degenerative disc disease. However, only 23% of people have opted for spine rehabilitation first. 73% of people tried other traditional methods of treatment including painkillers, surgery & conventional physiotherapy before spine rehabilitation. Also, of the people who are advised surgery, 62% of people seek other alternative treatments. This is report based on four cities and New Delhi, Mumbai, Bengaluru and Pune age ranged 16-34 years [17]. Another study in southern India both male and female above 19 years were found that 28.4% and 52.9% having low back pain. Socio economic status, lower educational qualification factors associated with low back pain [18].

Occupations like coal field miners have greater degree of musculoskeletal disorders (65.45%) Lower back pain is top among other musculoskeletal disorders (58.18%) in Eastern Coalfields of India. The prevalence of pain in different body sites of the miners increased significantly with their ages [19]. The Patients who work in handloom sectors, 2% had severe disabilities, 46% had moderate disabilities, and 52% had minimal disabilities due to low back pain among in West Bengal [20]. The prevalence of low back pain was found to be 42%. The majority of women (60.9%) with low back pain experienced moderate disability. Almost 72% of women with low back pain perceived their QOL as good and overall mean QOL score was 88.41 (standard deviation=12.9) [21]. 78.5% were having musculoskeletal morbidities at different sites. Out of 78.5 lower back Problem (31.1%) in garment industries in an urban slum of Chetla, Kolkata [22].

Musculoskeletal disorder is the outcome and the score of the frequency of exposure of physical and psychosocial risk factors as predictors. The most severely affected body regions across 1 year prevalence, activity limitation over the past year and 1 week prevalence were lower back Out of 211 workers 92 suffers from LBP in Karimnagar, Andhra Pradesh [23].

3.2 Low back pain in children

In the past, it was thought that children don't experience pain. Studies now indicate not only that children experience pain, but that the painful experience may have long lasting consequences. Research shows children are also suffered from low back pain. A study in Brazil out of 1,597 children prevalence of back pain on count three months was 55.7% (n=802). The study several factors were given for that outcomes-sex, parents with back pain, weekly frequency of physical activity, daily time spent watching television, studying in bed, sitting posture to write and use the computer, and way of carrying the backpack, behaviour and heredity aspects [24]. Children and youth aged 10–19 from the southeast of Poland, among 1089 respondents, 830 (76.2%) had experienced back pain Back pain was located mainly in the lumbar segment (74.8%). Mild pains were 44.7%. Girls experienced back pain significantly more frequently than boys (52.2% versus 47.8%) [25]. A review study on low back pain from English articles database from 2005 and 2012, 1087 studies identified, then refined to 35 studies. Meta-analysis suggest Non Specific Back Pain prevalence's of 24, 33%– last month; between 17.4% and 51, 3% - last 3 months; between 15, 6% and 61, 1% - last 6 months, between 17, 1% e 54, 1% - last year [26]. Another study showed those children and adolescents of 11 years 12.5%, 12years 16.30%, 13years 23.8%, 14years 24.1% [27].

3.3 Pain in the elderly

When compared with younger adults, elderly experience more secondary pain. Thus, older adults will probably describe pain as a burn-like sensation, rather than a sharp pain. Another finding in the elderly is a delayed response time to pain. There is no proof to suggest that the intensity of pain decreases with age. Modified reactions to pain may occur because of impaired communications skills or cognitive function. In the elderly, referred pain may not respect atypical pattern, as in silent myocardial infarction. Although this difference in pain perception translates into a clinical issue, there is no final evidence to support a link between old age and silent myocardial infarction. Low back problem are increased with age greatly in elders, a longitudinal study assessed 277 subjects aged 70 years at baseline and 77 years at follow-up. The prevalence of CBP increased from 44% to 58% at ages 70 and 77 years [28]. Other study found that above 70 years aged persons incidence rates of restricting back pain per 1000 person-months were 32.9 overall, 24.4 for men, and 37.5 for women [29]. 60 and 69 years old, married, with low education and the prevalence of low back pain was 55.8% of elderly patients studied, 52.2% in men and 47.8% women of the areas of Sao Paulo, Brazil [30]. Another meta-analysis was conducted for 13 studies reporting point-prevalence. Pooled point-prevalence of LBP was 25.0% (95% CI 18.0–32.0). Other three studies investigated period-prevalence: one-week prevalence = 15.0% (95% CI 13.0–18.0); six-month prevalence=43.0% (95% CI 42.0–44.0); and 12-month prevalence=13.0% (95% CI 11.0–16.0) [31]. The severity of low back pain aged ranged 36 years to 40 years 39.05% were male and 60.95% were female. High BMI and disc prolapsed most common in both males and females [32]. One study in India, 250 women in age group of 30-65 years residing in field practice area of a Tertiary Care Medical Institution, Puducherry, and the prevalence of low back pain was found to be 42%. The majority of women (60.9%) with low back pain experienced moderate disability. Almost 72% of women with low back pain perceived their QOL as good and overall mean QOL score was 88.41 [33]. Co morbidity among older patients also contributes to the variability in the reporting of prevalence of back pain [34].

3.4 Sex-based differences in pain experience

Women report more painful events than men do and they seem to have lower thresholds and tolerance to painful stimuli. There are also differences in the types of pain that occur more frequently in women compared to men. For instance, headaches occur in both men and women, but women experience more migraines with aura, whereas men report more migraines without aura. The base for these differences is not very well understood. Potential mechanisms in pain include: sex hormones, spinal cord, genetics, and stress. Researchers have discovered that brain activity in men and women differs during a painful experience. Silverman *et al.* used PET to observe brain activation patterns in healthy men and women who were not in pain and compared to those of men and women experiencing pain. The brain patterns of the men and women experiencing pain were significantly distinct, but there were no sex based differences in the control group. This suggests that men and women process pain in a very different manner [35]. Between age 18-30 years 25% Males, 11.9% Females, 31-40 years 38.6% Males, 26.3% Females, 41-50 years 23.9% Males, 38.1% Females and above 50 years 12.5% Males, 23.7% Females out of 206 patients were suffered from low back pain [36].

A study showed the prevalence and various risk factors for low back pain (LBP) in young adults in India (Delhi), from 1,355 young Indian Administrative Service aspirants and medical postgraduate aspirants aged 18–35 years were found that the LBP prevalence was 42.4% per year and 22.8% per week [16].

A review study assessed on basis 59 articles fulfilled the selection criteria. The mean point prevalence obtained from 10 studies was 0.120 (95% CI: 0.09 and 0.159). The mean period prevalence at 12 months obtained from 13 studies was 0.336 (95% CI: 0.269 and 0.410), whereas the mean period prevalence at one week obtained from six studies was 0.177 (95% CI: 0.124 and 0.247). The mean lifetime prevalence obtained from 30 studies was 0.399 (95% CI: 0.342 and 0.459). Lifetime prevalence exhibited a positive, statistically significant relationship with the mean age was found [37].

Reviews of the literature describing LBP point prevalence in the developed world have produced variable estimates of prevalence rates. In the studies deemed by Looney and Stratford to be methodologically superior, the LBP point prevalence was estimated to be 6.8% in North America, 12% in Sweden, 13.7% in Denmark, 14% in the United Kingdom, 28.4% in Canada, and 33% in Belgium. The size of the difference between the North America LBP point prevalence estimated by Deyo and Tsui-Wu at 6.8% and that of Canada at 28.4% subsequently surveyed 3000 Australian adults using contemporary epidemiological methods, and estimated the point prevalence of LBP at 25.5%, six month period prevalence at 64.6% and lifetime prevalence at 79.2% [38, 39, 40, 41].

5. Conclusions

Lower back pain decreases potentiality of work efficiency. Past Studies reported that lower back pain reduced overall quality of life. In this study we found that wideness of low back pain is unequal percentage throughout the globe due to factors like socio-economic conditions, nature of activity, habits etc. In India near about 8% peoples years lived with disability (YLD) due to low back problem and 4.6% peoples Disability-Adjusted Life Years (DALYs) in musculoskeletal disorder in India. Rate of change DALYs in respect of low back pain has been 1.2% to 2.3% between years 1990 to 2016. Further investigation requires which may fulfil the epidemiological structure of low back pain to all country.

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