

## Research Article

# COST BURDEN OF LOW BACK PAIN AMONG ADULTS IN SOUTHERN NIGERIA

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## ABSTRACT

A very key aspect of health care policy making Worldwide is the estimation of cost burden of a disease condition. Up till date, such documents are nonexistent especially on non-communicable diseases like low back pain (LBP) in the health policy making process in Nigeria. This article therefore attempts to report the results of a retrospective study on the direct cost burden of LBP in adults of southern Nigeria. It was a collaborative cross-sectional study amongst four health facilities in Southern Nigeria which estimates the direct health care cost for the management of LBP. Medical records of two hundred and twenty (220) patients whose ages ranged between 26 and 65 years and were managed from acute care period for LBP (without discharge against medical advice) as well as were followed up on out-patient basis without default within the study period were purposively selected from the medical record departments/units of the study centers. The files were assessed for various investigations and treatment interventions of acute and long term care and the costs thereof. Ethical approval to access patients' case files was granted by the Research and Ethics Committee of the different study centers. The results revealed that it requires an average of N196,200: 00 (\$1226.25 = ₦77.81) and N781,500: 00 (\$4884.37 = ₦496.49) in a government and private owned hospitals, respectively to access care between 2 and 52 weeks of post diagnosis LBP case in Nigeria.

The study concludes that managing LBP constitutes a substantial direct cost burden and there is a consequence of disability adjusted life year and attendant reduced quality of life as a result of unaffordable cost of care amongst sufferers.

**Keyword:** Cost burden, low back pain, Nigeria.

## INTRODUCTION

Back pain is a major health and socio-economic problem in Western society; it presents with large and growing economic burden with attendant disability in its sufferers<sup>1</sup>. It is second only to common cold as a reason for outpatient visits and represents the single most common and most expensive industrial and occupational health problem<sup>2</sup>. It is usually defined as pain, muscle tension, or stiffness localized below the costal margin and above the inferior gluteal folds, with or without leg pain<sup>3</sup>; and it can be classified as "specific" (suspected pathological cause) or "non-specific" (about 90% of cases)<sup>4</sup>. Back pain is usually defined as acute if it

lasts less than six weeks, sub acute if it lingers between six weeks and three months, and chronic when it lasts more than three months<sup>5</sup>. Frequent episodes are described as recurrent back pain.

Back pain of musculoskeletal origin is a major medical and economic problem in Western society, with the pain and associated disability linked with a significant loss of productivity and substantial health care expenditures<sup>2,4,6,7</sup>. Approximately, 90% of adults will suffer from an episode of LBP at some time in their lives, 50% will have a recurrent episode and 5–10% will develop chronic and potentially disabling low back pain (LBP)<sup>8</sup>. Back pain affects both men and women with controversial gender affectation ratio and differences in predisposing factors exist between genders<sup>2</sup>. Increasing prevalence and burdens of back pain globally have called for improved research into all areas related to its causes and ways to ameliorate it.

The direct cost of low back pain management by healthcare providers in Australian adults in 2001 was AU dollars 1.2 billion<sup>9</sup>. A further AU dollars 8.15 billion in indirect costs such as loss of productivity giving a total cost of AU dollars 9 billion<sup>9</sup>. The economic burden of low back pain in Australian adults represents a massive health problem, the problem is believed to be so great that it has compelling and urgent ramification for health policy, planning and research.

Estimates of direct health care costs of back pain in the UK in 1998 were found to be £1632 million<sup>10</sup>. Approximate percentages of these costs on different areas of interventions for back pain have been analyzed and documented and about 35% of this cost has been related to services provided in the private sector and therefore most likely paid for directly by patients and their families. The cost of informal care and production losses related to back pain is however more significant than the direct cost of back pain. Overall, back pain is one of the most costly conditions for which an economic analysis has been carried out in the UK and the findings are in line with reports from other developed countries<sup>10</sup>.

However, the direct cost burden of this expensive and highly disabling condition has not been established in Nigeria. This gap in the body of knowledge and research efforts is what informed this study.

## Methodology

The study was a retrospective investigation collaborating data from multiple centers with spread across urban and rural centers within two geo-political zones of Nigeria. The centres included industrial hospital [of an Oil and Gas Company] in Port Harcourt, a Government tertiary hospital in Port Harcourt (both in Rivers State), a Government tertiary hospital in Edo state, all in South-South geo-political zone of Nigeria and a Private Specialist hospital in Lagos, South-West zone of Nigeria.

Case notes of purposively selected patients whose care commenced from acute care stages, admitted where necessary (without discharge against medical advice) and were followed up on to out-patient basis without default within the study period were used for the study. The standpoint of the study involved recording the direct cost (micro-costing) of acute and long term care, investigations and interventional procedures in the management of low back pain of the selected patients. Areas covered included obtaining and recording the micro-costing of radiological investigations like the X-ray, magnetic resonance imaging (MRI), laboratory investigations, in patient admission and nursing care, medications prescribed by physicians and/ or surgeons and physiotherapy care. Indirect and intangible costs borne on variables that are patient specific like numbers of topical analgesic cream tubes, informal and non-health

services costs were excluded from the scope of the study. Other exclusion factors were the records of those whose interventional or management details were either incomplete, or those who were discharged against medical advice, and those whose care trends were not consistent. Patients whose care extended into surgical care/ interventions such as decompression laminectomy were also excluded from the study. Ethical approval to access patients' case files was sought and obtained from the Research and Ethics Committees of the different study centers.

Other relevant data which included sex, age, cause of back pain, various investigations and interventions, their costs, [etc] were also retrieved.

Data collected were analyzed using SPSS [(Version 20, Chicago IL, USA)]. Descriptive statistics of mean, standard deviation and percentage were used for the analysis.

## RESULTS

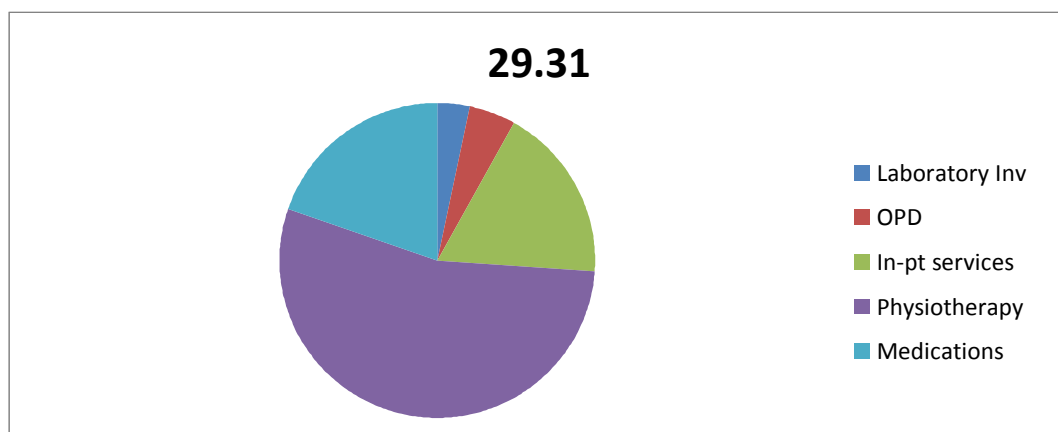
A total of two hundred and twenty (220) medical records of patients managed for LBP within the last three years (2010-2013) were randomly selected from the medical records departments/units of the study centers. They were those whose ages ranged between 26 and 65 years [(mean and SD) 42.36±13.18yrs], and were 143(65%) males and 77(35%) females managed for a minimum of 2 weeks and a maximum of 52 weeks post diagnosis. The results revealed that it required an overall average of N196,200: 00 (\$1226.25 = €877.81) and N781,500: 00 (\$4484.37 = €3496.49) as direct care cost to access care for low back pain in a government owned and a private hospital respectively within 2 and 52 weeks in Nigeria.

The results also revealed that it costs an average of N57,500.00 (\$359.4 = €257.26) and N83,500 (\$521.88 = €373.59) for radiographic investigations which include X-rays and magnetic resonance imaging (MRI) in government owned and private hospitals respectively. The results also showed that it costs an average of N4600: 00 (\$28.75 = €20.58) and N15,000: 00 (\$93.75 = €67.11) for laboratory investigations in government owned and private hospitals respectively. A patient with low back pain required an average sum of N25,000: 00 (\$156.25 = €111.85) and N43,750: 00 (\$273.44 = €195.74) for hospital admission care which included nursing and bed fees for two to three weeks of admission on skin traction or bed rest (where necessary) in government owned and private hospitals respectively. The findings from the study also revealed that it costs an average patient between N10,000:00 and N38,500 for physiotherapy for two weeks treatment sessions in government and private hospitals respectively. Annual physiotherapy sessions for low back pain management is estimated to cost N75,000: 00 (\$468.75 = €335.55) and N576,000: 00 (\$3600: 00 = €2577.06). The costs of prescribed medications to manage patients with low back pain for 2 weeks from physicians working in government and private hospitals are N7500: 00 and N16,000: 00 while it costs an average of N27,500: 00 (\$171.88 = €123.04) and N35,750: 00 (\$223.44 = €159.95) to procure prescribed medications for one year care in government and private hospitals respectively in Nigeria. [Average costs of hospital out-patient visits is N1200 (\$7.50 = €5.37) and N5000 (\$31.25 = €22.37) for 2 weeks consultations in government and private hospitals respectively] while it costs a low back pain patient an average of N6600: 00 (\$41.25 = €29.53) and N27500: 00 (\$171.88 = €123.04) for 12 months consultations in government and private hospitals respectively. Overall, it costs an average of N196,200: 00 (\$1226.25 = €877.81) and N781,500: 00 (\$4484.37 = €3496.49) as annual direct cost for an individual to manage low back pain in government and private hospitals in Nigeria (Table 1).

**Table 1: Summary of the direct cost burden of Low Back Pain in Nigeria**

Variables	Cost		Percentage	
	Government Hospitals	Private hospitals/ clinics	Government Hospitals	Private hospitals/ clinics
<b>Radiographic investigations</b>	N57,500.00 (\$359.4) €257.26	N83,500 (\$521.88) €373.59	29.31	10.68
<b>Laboratory Investigations</b>	N4600: 00 (\$28.75) €373.59	N15,000: 00 (\$93.75) €67.11	2.34	1.92
<b>Out-patients Medical consultations</b>	N6600:00 (\$41.25)	N27,500: 00 (\$171.88)	3.36	3.52
<b>In-patients care</b>	N25,000: 00 (\$156.25) €11.85	N43,750: 00 (\$273.44) €95.74	12.74	5.59
<b>Physiotherapy sessions</b>	N75,000: 00 (\$468.75) €335.55	N576,000: 00 (\$3,600.00) €2577.06	38.2	73.70
<b>Medications</b>	N27,500: 00 (\$171.88) €123.04	N35,750: 00 (\$223.44) €59.95	14.02	4.57
<b>Total</b>	<b>N196,200: 00</b> <b>(\$1226.25) €877.81</b>	<b>N781,500: 00</b> <b>(\$4884.37)</b> <b>€3496.49</b>	<b>100</b>	<b>100</b>

N= Naira; \$= American dollar; €= Euro

**Table 2: Pie chart showing Analysis of the Percentage of cost of each item in government hospitals**

**DISCUSSION**

The present study has investigated the cost burden of managing patients with low back pain in Southern Nigeria. To the best of the authors' knowledge, the present study represents the first known attempt in Nigeria to document estimation of direct cost burden of a musculoskeletal disorder of low back pain, especially from a collaborative and multicentre point of view. Literature has stated that research publications on LBP suggest that most researches have been conducted in the developed world, and therefore little is known about the epidemiology and cost burden in the rest of the world<sup>11</sup>. As a result, local studies were unavailable to either support or refute the findings of this study. The present study has discretionally converted and reported all the costs (Nigerian Naira) used in this report to 2014 US dollars and European Euro equivalents to represent their international values. LBP is the most prevalent musculoskeletal condition and one of the most common causes of disability in the developed nations<sup>11</sup>, with average estimated 12month prevalence of 44% in Nigeria<sup>12,13</sup>. Using the above cost analysis for cost estimation and putting Nigeria population at 170million people, according to the 2013 census<sup>14</sup> and the prevalence rate of 44%, it is estimated that direct cost of managing low back pain in Nigeria ranges between N14.7trillion (\$91.7billion=€65.7billion) and N58.4trillion (\$365billion= €261billion) annually. This amount is huge for a country with per capita income of \$2,748 and total annual national budget of N4.962trillion (\$31.01billion= €22.20billion) with health sector budget of N262.74billion (\$1.7billion) for the year 2014. The total direct cost for low back pain management in Sweden in 2001 which was calculated to be 297.6 million Euros was considered to be substantial<sup>15</sup>. This amount of expenditure for LBP was considered to represent 11% of the total costs for short-term sick leave in Sweden in 2001<sup>15</sup>. Africa accounts for about 14% of the world's population, and it is also the poorest continent, bearing about 40% of the global burden of disease<sup>11</sup>. In the United Kingdom, the total annual direct cost attributable to low back pain is estimated as £1.6billion (\$2.68billion)<sup>16</sup>. Direct cost of managing LBP in Australia in 2001 was estimated to be AU dollars 1.02 billion=\$95.847million=€69.019million<sup>9</sup>, and 5 billion euro=\$694.35million USD per year in Germany at the same period<sup>17</sup>. One-third of the over \$100 billion incurred as total costs associated with LBP management in the United States in 2006 review was reported to be attributed to direct costs<sup>18</sup>. These countries have higher per capita income of \$43,075, \$40,007 and \$53,101 for Australia, Germany and the United States of America respectively than that of Nigeria which is \$2,748. Greater percentage of the cost for LBP management in Nigeria was borne in private care which indicates that they are most likely borne directly by the citizens.

With regards to the distribution of the cost burden of managing low back pain to different healthcare providers, this study revealed that physiotherapy cost accounts for 38.2% and 73.7% of the total annual direct management costs in government and private hospitals respectively. Physiotherapy cost constituting the greater percentage of the direct cost of managing low back pain as observed in this study is in agreement with findings in other studies in the United Kingdom, Australia, Europe and the United States of America<sup>9,10,19</sup>. However, the study has revealed higher percentage of cost for radiological investigations (10.68- 29.31 %) and medications (4.57 – 14.02%) than previously reported in similar study in the UK<sup>10</sup> where radiology and medications accounted for 5% and 7% respectively. Meanwhile, the proportion of costs for medications (14%) in this study is similar to the findings (13%) of a similar study in the United States<sup>19</sup>.

## CONCLUSION

This study concludes that managing low back pain constitute an enormous sum of money that is generally beyond what an average Nigerian can easily afford judged by the country's per capita income. It is therefore suggested that emphases should be placed on preventive measures, improved health education and ergonomics in work places, that can reduce the prevalence of low back pain amongst citizens so that the substantial financial burdens for its management can be reduced. This trend can also result in reducing disability arising from low back pain and enhancing the quality of life amongst populace. This study has established a model for health economic management for government and other organizations involved in health care resources management to help in further equitable resource planning and management for better health for Nigerian citizens. The findings from the study have also generated a robust document for other authors or researchers who may be interested in this area of study.

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