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# Rehabilitation of Patients With Low Back Pain in Hospitals in Ibadan, Oyo State, Nigeria.

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#### **ABSTRACT**

This Study Investigates The Current Methods Of Diagnosing And Rehabilitating Low Back Pain (LBP), Prevalence Of LBP In Ibadan, A City In The Southwestern Part Of Nigeria, And Compares Them With International Practices, Using Croatia As A Case Study. Five Hospitals In Ibadan And Hospitals In Rijeka And Opatija, Croatia, Served As Data Sources.

An Online Questionnaire Was Distributed To Medical Practitioners-Physiotherapists, Medical Doctors, Medical Laboratory Scientists And Nurses Across Different Hospitals In The Locations Mentioned Above. A Total Of 101 Responses Were Collected: 51 From Ibadan, Oyo State And 50 From Croatia. In Ibadan, Oyo State, 45.1% Of The Respondents Reported That LBP Occurs More Frequently In Women, While Only 3.9% Said It Is More Common In Men. Occupations Involving Significant Physical Effort Were Identified As A Major Risk Factor, Cited By 27.5% Of Participants. In Addition, 66.7% Of The Respondents Believed That Individuals From Any Profession Could Be Affected. Regarding Diagnostic Tools, 66.7% Of Respondents Confirmed The Availability Of Diagnostic Methods For LBP In Their Hospitals. Knowledge Of Diagnostic Methods Was High For X-Ray(96%), While Fewer Were Aware Of CT Scans (37.3%), Mris (51%), EMG (6%), Blood Tests (6%) Urine Tests (2%), Physical Tests (9.8%) And ESR (2%).

The Most Commonly Available Rehabilitation Methods In Ibadan Hospitals Were: Transcutaneous Electrical Nerve Stimulation(TENS) (66.7%), Kinesitherapy (45.1%), Hydrotherapy (17.6%), LASER (7.8%), Biofeedback Training (23.5%), Traction (56.9%), Proprioceptive Neuromuscular Translation(PNF) (29.4%), Thermotherapy: (3.9%), Phonophoresis (1.9%), Ergonomics (1.9%) And Others.

In Croatia,58.8% Of Respondents Reported LBP As Common Among Both Genders. 24% Reported That LBP Is Mostly Common Among Females And 16% Stated That LBP Is Mostly Occurring In The Male Gender. Comparable To The Data Gathered From The Respondents In Ibadan, 24% Of The Participants Responded That Individuals Engaged In Physically Demanding Occupations Are Mostly Susceptible To Low Back Pain; 16% Reported That Cooperate Workers Are Mostly Susceptible To LBP And 60% Of Respondents Reported That People From Any Kind Of Profession Can Be Susceptible To LBP. 66% Of The Participants Responded Positively To The Availability Of Diagnostic Methods For LBP In Their Places Work; 18% Responded Negatively And An Equivalent Of 18% Also Responded 'Not Sure'. More Diagnostic Methods Were Reported To Be Available: X-Ray(20%), CT Scan(2%), EMG(8%), Physical Examination(4%), Particularly MRI(62%).

Rehabilitation Options Were Also More Extensive, With Kinesitherapy(92%), TENS(88%), Hydrotherapy (62%), LASER(64%), Traction (34%), PNF (54%), Biofeedback Training (18%), Ultrasound (2%), Proprioceptive Deep Tendon Reflex(PDTF)(2%), Cyriax(2%), Mulligan Therapy (2%).

Overall, Hospitals In Ibadan, Oyo State, Nigeria Lack A Comprehensive And Consistent Rehabilitation Framework For LBP, Falling Short Of International Standards. There Is A Pressing Need For Educational Programmes And Infrastructure Improvements To Align Ibadan's Rehabilitation Services With Global Practices, Thereby Improving The Chances Of Full Recovery Of Patients Diagnosed With LBP And Ultimately, Enhancing Their Quality Of Life.

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**Keywords:** Croatia, Diagnosis For LBP, Hospitals, Ibadan, Low Back Pain, Physiotherapy, Rehabilitation Procedures.

# INTRODUCTION

Low Back Pain (LBP) Is One Of The Most Common Musculoskeletal Disorders Affecting People Globally, And It Is A Leading Cause Of Disability Seen In Primary Healthcare Settings. It Is Typically Defined As Pain, Muscle Tension, Or Stiffness Localized Below The Costal Margin And Above The Inferior Gluteal Folds, With Or Without Sciatica (Radiating Leg Pain) (1,15,16).LBP May Be Classified As Acute (Lasting Less Than Six Weeks), Sub-Acute (Lasting Six To Twelve Weeks), Or Chronic (Lasting Longer Than Twelve Weeks). It Can Also Be Categorized As Specific—Caused By An Identifiable Condition Such As A Spinal Disease—Or Non-Specific, Where No Clear Structural Pathology Is Found (6).

According To The World Health Organization, LBP Can Affect Individuals Of Any Age, Including Children And Adolescents, With Peak Prevalence Occurring Between Ages 50 And 55. Women Are Generally More Affected Than Men (6).

Several Risk Factors For Chronic Low Back Pain Have Been Identified Through Prospective Studies. These Include Male Gender (In Some Cases), Multiple Functional Symptoms, Leg Pain, And Occupational Factors Such As Blue-Collar Jobs, Heavy Physical Labor, And Poor Working Conditions (7).

Research Shows That Nearly Everyone Will Experience LBP At Least Once In Their Lifetime, With Lifetime Prevalence Rates Ranging From 49% To 70%. In High-Income Countries, LBP Is Often Work-Related. For Example, In The United Kingdom, It Accounts For 12.5% Of All Sick Leave. In The United States, 2–4% Of The Workforce Receives Compensation Each Year For LBP. A Longitudinal Study Conducted In 1992 And Repeated In 2006 Showed A 6.3% Increase In Chronic LBP Prevalence Over A 14-Year Span Across All Adult Age Groups, Gender And Ethnicities (8).

LBP Is The Leading Cause Of Functional Disability—Particularly In The Elderly (Ages 80–85)—And Contributes Significantly To Work Absenteeism. It Imposes A Heavy Socioeconomic Burden On Individuals, Families, Industries, And Governments (2). Global Prevalence Rates Are As High As 84%, With 23% Of Those Affected Experiencing Chronic Symptoms, And 10–14% Suffering From Activity-Limiting LBP. Factors Such As Sedentary Lifestyles, Obesity, Mental Health Issues, And Changes In Work Habits Have Contributed To A Growing Prevalence Among Adolescents. Worldwide, LBP Is Considered The Most Common Musculoskeletal Disorder, Resulting In Approximately 149 Million Workdays Lost Annually And Having A Significant Impact On Productivity And Economic Well-Being (3, 4).

In Mexico, Official Statistics Show That Chronic LBP Accounts For 10–15% Of Disability Claims. In 2007, It Led To 3,102 Retirement Pensions. Similarly, In Argentina, LBP Is The Third Most Common Work-Related Disability (8).

The Diagnosis And Management Of LBP Vary Significantly Across Countries (1). It Has Been Recognized That LBP In Childhood And Adolescence Is A Common Complaint As That Observed In Adults (14). While Some Studies Report That Adolescent LBP Is Usually Mild And Temporary, Others Suggest That Recurrent Back Pain In Youth May Predispose Individuals To Chronic Pain In Adulthood. Though Data From Low- And Middle-Income Countries Is Limited, Earlier Reviews Suggest That LBP May Be Less Prevalent In Those Regions. However, Recent Evidence Indicates That Its Prevalence Is Increasing In African Populations And Should Not Be Overlooked (9).

Among Identified Risk Factors, Prolonged Sitting And Frequent Bending Are Prominent. LBP Can Affect Sleep Quality And Is More Common With Advancing Age. Other Contributing Factors Include Obesity, Poor Posture Heredity, Smoking, Physical Strain, And Psychosocial Stressors Such As Anxiety Or Depression. A Notable Finding In This Study Is That Many Respondents Reported Involvement In Physically Demanding Or Income-Generating Activities, Which Correlated With Higher Rates Of LBP (9, 10, 12, 13).

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Lower Socioeconomic And Education Levels Have Also Been Associated With Higher LBP Prevalence. As A Result, The Burden Of LBP May Be Greater In Low- And Middle-Income Countries Such As Those In Africa (5). In Nigeria, The Annual Prevalence Of LBP Among Healthcare Workers Is Estimated At 39.1%, With An Associated Economic Burden Averaging \$\frac{\text{N}}{139}\$,156.25 \pm 77,091.16 (Approximately \$385 \pm \$213\$ USD) (3).

A Research Proved That LBP Is One Condition In Which The Greatest Number Of Patients Can Benefit From Rehabilitation. Despite The Significant Burden Of LBP, There Has Been Limited Research In Nigeria—Particularly In Ibadan, Oyo State—On Effective Diagnostic And Rehabilitation Methods. This Is Noteworthy Considering That Nigeria Is The Most Populous Country In Africa And The First In West Africa To Offer A Bachelor's Degree In Physiotherapy. The Need To Explore This Topic Is Critical, Especially Given The Strong Evidence That Rehabilitation Is One Of The Most Effective Strategies For Managing LBP (9).

Understanding The Anatomy Of The Lower Back Helps Explain The Varied Sources Of Pain. The Lower Back

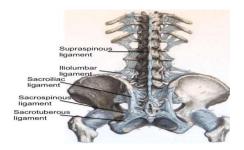
Extends Via The Lumbar And The Sacral Regions Of The Spine (Figure 1). It Supports Mainly The Weight Of The Upper Body. The Intervertebral Discs Between Vertebrae Act As Shock Absorbers During Body Movements. Figure 2 Shows Ligaments In That Region As Well, Holding The Vertebrae In Place And Tendons That Attach The Muscles To The Spinal Columns (18).

Figure 1: The Lumbar Spine



**Source:** <u>Lumbar Spine Labeled Stock Illustrations – 96 Lumbar Spine Labeled Stock Illustrations, Vectors & Clipart - Dreamstime</u>

Figure 2: Lumbar Ligaments Structure



Source: <u>Lumbar Ligaments Lumbar Spine Structure Anterior Longitudina</u>

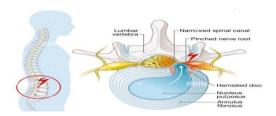
There Are Thirty-One Pairs Of Nerves That Are Rooted To The Spinal Cord And They Control Body Movements And Transmit Signals From The Body To The Brain. The Lumbar Spine Is Made Up Of 5 Moveable Vertebrae (L1 To L5) As Shown In Figure 1. The Intervertebral Discs Along With The Laminae, Pedicles And Articular Processes Of Adjacent Vertebrae, Create Space For The Spinal Nerves. There Is An Increase In Size As The Spines Descend- This Reflects The Responsibility Of The Lumbar Spine Of Supporting The Entire Upper Body (18). The Lumber Spine Has The Highest Capacity Of Extension Due To The Intervertebral Discs Relative To The Size Of The Vertebral Body And Direction Of The Spinous Processes (Horizontal) And The Anatomy Of The Lumbar Region Also Includes A Complicated Innervation And Vascular Supply. The Lower Back's Anatomy Enables Flexion, Extension, And Lateral Movement, But Its Limited Rotational Capacity Makes It Vulnerable To Injury During Twisting Or Lifting (18).





LBP May Originate From The Nucleus Pulposus, The Annulus Fibrosus, The Facet Joints, The Ligaments, The Muscles, The Nerves Or The Synovium (16,19).

Figure 3:. Herniated Disc Of The Lumber Spine

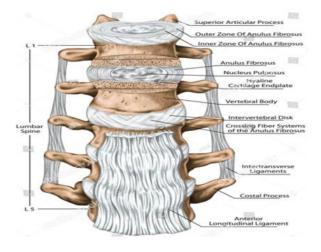


**Source:** Herniated Disc Of The Lumbar Spine, Stenosis, Slipped Disc, Labeled Illustration Stock Photo | Cartoondealer.Com #249809898

Herniation Of The **Nucleus Pulposus**(As Shown In Figure 3)- A Gelatinous Substance (Made Of A Mesh-Work Of Collagen Fibrils Suspended In A Mucoprotein Base, Which Contains Mucopolysaccharides And Water) Can Irritate Surrounding Nerves. The Anterior Ventral Body Develops Faster Than The Posterior Part, The Nucleus Pulposus Tends To Lie More Posteriorly. As A Result Of This, The Anterior Part Of The Annulus Fibrosus Have Thicker And Stronger Fibres Due To The Posterior Position Of The Nucleus Pulposus, Hence, The Annulus Gives Better Protection Against Anterior Than Posterior Displacements Of The Nucleus; This Is Unfavourable With Respect To The Contiguous Nerve Roots And Dura (17).

**The Annulus Fibrosus,** Made Up Of 15 To 25 Concentric Fibrocartilaginous Sheets Each Formed By Parallel Fibres, Running Obliquely At A 30degrees Angle Between The Vertebral Bodies. The Annulus As Well As The Nucleus Can Act As Pressors On Transversing And Exiting Nerve Roots, Also Generating Neuropathic Pain. The Fibres Of Two Consecutive Layers Of The Annulus Fibrosis Cross Each Other At An Angle Of Approximately 120degrees. The Outermost Fibres Are Attached Directly To A Bone Around The Apophysis Which Is Why They Are Referred To As The Ligamentous Portion Of The Annulus Fibrosus (17,18).

**Figure 4:** The Lumbar Ligaments



**Source:** Spinal Ligament Of The Lumber Spine - Search Images

The Spinal Ligaments (Figure 4) Contain Stretch Receptors And Nerve Endings. Take Note That, When Ligaments Are Stressed Beyond Limit, They Get Torn, Strained And Generate Pain. An Example Is The Posterior Longitudinal Ligament That Is Innervated By The Sinuvertebral Nerve As Well As A Lot Of Free Nerve Endings While The Anterior Longitudinal Ligament Receives Innervation From The Gray Rami Commubicantes And The Ventral Rami. These Nerves Trigger Pain When Overstretched.

**The Facet Joints**, Similar To Knee Joints Are Made Up Of Cartilage Which Allow For Smooth Movement At The Intersection Of Two Bones And Also, Protect The Sensitive Subchondral Area. Facet Joints Have A High

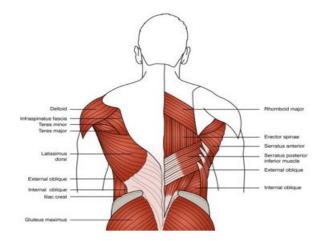




Density Of Mechano-Sensitive Afferent Nerve Fibers That Are Nociceptive, Therefore, They Are A Potential Source Of Pain. Accumulated Lactic Acid In Overused Muscles May Further Contribute To Discomfort (17, 18).

Hip Joint Pathologies Such As Labral Tear & Rim Lesions Can Mimic LBP, Making A Thorough Physical Assessment Essential. An Author Wrote That Provocative Techniques And Diagnostic Imaging Have Shown That The Most Likely Causes Of Low Back Pain Include Damage To The Inter-Vertebral Discs And The Apophyseal Joints. When Low Back Pain Has Become Chronic(Lasting A Long Duration), It May Involve Abnormalities Of The Ligaments Of The Inter-Vertebral Joints, Muscles, Fascia And Neural Tissues. Repetitive Torsional Stress, Especially From Bending And Twisting, May Injure The Apophyseal Joints And Lead To Pain. The Annulus Fibrosus Is Most Vulnerable To A Combination Of Axial Rotation And Forward Flexion Which Leads To The Clinical Situation Resulting From Lifting In A Bent And Rotated Position. Some Possible Causes Of Pain From The Apophyseal Joint Include Capsular Tears, Capsular Avulsions, Subchondral Fractures And Hemorrhage Into The Joint Space (19).

Figure 5: Lower Back Muscles From Behind



**Source:** Why Are Core Muscles Important For Back Pain? | London Spine Unit | UK's Best Spinal Clinic | Harley Street

Furthermore, Figure 5 Illustrates Trigger Points In Muscles Such As Erector Spinae, Quadratus Lumborum And Gluteal Muscles Often Exacerbate Chronic Pain Symptoms. Some Authors Explained That They May Not Have Been The Original Problem But They Tend To Become The Major Source Of Pain. In LBP, The Greatest Contribution To Pain Is Usually From The Joints. In Chronic Or Long Lasting LBP Situations, There May Be Considerable Contributions From Muscles And Neural Tissues (19).

Table 1: Causes Of Low Back Pain

COMMON CAUSES	LESS COMMON CAUSES	NOT TO BE MISSED
Somatic Injury	Intervertebral Disk Prolapse	Malignancy
Intervertebral Disk	•Acute Nerve Root Compression	•Primary
•Apophyseal Joint	Spondylolisthesis	■Metastatic
Sacroilliac Joint Injury/Inflammation	Lumbar Hypermobility	Osteoid Osteoma
Paravertebral And Gluteal Muscle Trigger Points	Stress Fracture Of The Pars Interarticularis(Spondylolysis)	Multiple Myeloma
	Spinal Canal Stenosis	Severe Osteoporosis

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Vertebral Crush Fracture	
Hip Joint Pathology	
Fibromyalgia	
Rheumatological Causes	
Gynecological Causes	
Gastrointestinal Causes	
Genitourinary Causes	

Source: Brukner & Khan's Clinical Sports Medicine; 4th Edition

Table 1 Shows A Comprehensive List Of Likely Causes Of LBP. A Comprehensive Patient History And Physical Examination Are Vital In Diagnosing LBP. Clinicians Must Assess The Location, Onset, Severity, Timing And Range Of Movement, Observation Of Stiffness, Tenderness In Muscles & Joints, Neurological Abnormalities Or Signs Of Neural Irritation And Aggravating Factors And Use Tools Like The Oswestry Or Roland-Morris Disability Indices. Some Serious Problems That Must Be Taken Note Of Include: Spinal Cord Symptoms, Cauda Equina Symptoms, Systemic Symptoms, Motor Symptoms, Sensory Symptoms, Night Pain, Etc. Obsevation Should Be Done From The Side And The Posterior(19).

Some Movements To Observe Are Flexion, Extension, Lateral Flexion, Combined Movements Quadrant Position And Single-Leg Extension. Passive Movements Should Be Observed As Well: Over-Pressure May Be Applied At The End Of Range Of Active Movements- Muscle Length (E.G. Psoas, Hamstring, Gluteals) And Hip Quadrant. Palpation Of Spinous Processes, Transverse Processes, Apophyseal Joints, Sacroiliac Joint, Iliolumbar Ligament, Paraspinal Muscles, Quadratus Lumborum, Gluteal Muscles. Lastly, Special Tests Should Be Carried Out: Straight Leg Raise/Slump Test, Prone Knee Bend/Femoral Slump, Sacroiliac Joint Test And Neurological Examination (19).

In Nigeria Generally, LBP Has A High Prevalence And Is A Significant Public Health Concern Among Various Population Groups, Including Manual Labourers, Health Care Professionals, Students And Office Workers. Research Has Also Shown That Cultural Attitudes Toward Pain And The Evidence Of Symptoms Also Complicate Diagnosis, Treatment And Rehabilitation. Many Individuals Rely On Traditional Or Spiritual Healers Before Seeking Formal Medical Care, Potentially Delaying Diagnosis And Complicating Outcomes. In Addition, About 97% Of Rural Nigerians Use Unconventional Medicine For Managing Their Musculoskeletal Pain. This Is Often Due To Inaccessibilty Or The Fear Of Conventional Health Care (11, 20).

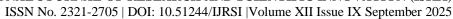
This Study Examines The Current Diagnostic And Rehabilitation Practices Of LBP In Five Hospitals In Ibadan, Oyo State, Nigeria And Compares Them With Those In Rijeka And Opatija, Croatia. The Findings Aim To Support The Integration Of More Advanced Rehabilitation Strategies Into The Primary, Secondary And Tertiary Levels Of Ibadan City's Healthcare System, With The Ultimate Goal Of Improving Patient Recovery And Quality Of Life. It Is Hoped That The Study Findings Will Enable The Incorporation Of More Advanced Rehabilitation Procedures In Primary, Secondary And Tertiary Levels Of Care In Ibadan, Oyo State, Nigeria.

# OBJECTIVES AND HYPOTHESES (CILJEVI I HIPOTEZE)

# **Objectives**

**C1:** To Determine Whether Hospitals In Ibadan, Oyo State, Nigeria Have Effective Rehabilitation Procedures In Place For Managing Patients Diagnosed With Low Back Pain (LBP).

**C2:** To Examine Whether The Rehabilitation Practices Used In Ibadan, Oyo State, Nigeria, Align With Internationally Recognized Standards And Methods For The Treatment Of LBP.





#### **Hypotheses**

**H1:** Hospitals In Ibadan, Oyo State, Nigeria, Lack Efficient Rehabilitation Procedures For Managing Patients With LBP.

**H2:** The Rehabilitation Procedures Implemented In Ibadan, Oyo State, Nigeria, Do Not Align With International Standards For LBP Management.

# SUBJECTS (MATERIALS) AND METHODS

# Subjects/Materials

This Research Employed A Cross-Sectional Survey Design Using A Google Form To Collect Data From Healthcare Professionals (Physiotherapists, Medical Doctors, Nurses, And Medical Laboratory Scientists) In Five Hospitals In Ibadan, Oyo State, Nigeria, And Several Hospitals In Rijeka And Opatija, Croatia. Hospital Selection In Ibadan Was Based On Government Affiliation: One Federally Managed, Two State-Managed, And Two Privately Owned. In Croatia, Hospitals Were Selected Based On Their Public Ownership, Long-Standing Establishment, And Broad Patient Base.

Participants Were Eligible If They Were Actively Practicing In The Specified Regions And Voluntarily Agreed To Participate In The Study.

#### **Procedure And Instruments**

Two Healthcare Professionals From Each Of The Five Selected Hospitals In Ibadan Were Contacted And Briefed On The Research Objectives. They Were Asked To Share The Questionnaire Link With Colleagues In Their Respective Facilities. Responses Were Monitored Through Email Notifications From The Research Coordinator. In Croatia, Bulk Emails And Direct Physical Requests Were Used To Distribute The Questionnaire. Participants Were Assured Of Confidentiality And Informed That Completing The Form Would Take Approximately Five Minutes.

The Questionnaire Included The Following Key Questions:

- 1. Duration Of Professional Practice
- 2. Frequency Of LBP Cases Observed
- 3. Gender, Age, And Weight Patterns In LBP Diagnosis
- 4. Occupations Most Susceptible To LBP
- 5. Influence Of Urban/Rural Residence On Chronic LBP Prevalence
- 6. Availability And Types Of Diagnostic Methods For LBP
- 7. Awareness Of Public Health Prevention Programs
- 8. Usual Duration Of LBP Recovery
- 9. Available Rehabilitation Methods And Observed Outcomes

Rehabilitation Methods Assessed Included Kinesitherapy, TENS, Hydrotherapy, LASER, Biofeedback Training, Traction, And PNF. Each Method Was Assigned A Score: Kinesitherapy And PNF Received 3 Points Each Due To Their Global Effectiveness, While The Others Received 2 Points Each. This Scoring Was Not Disclosed To Participants To Ensure Unbiased Responses.

Efficiency Was Rated On A 16-Point Scale:

- 1. 0–8: Insufficient
- 2. 9–10: Sufficient
- 3. 11–12: Good
- 4. 13–14: Very Good
- 5. 15–16: Excellent





#### **Statistical Data Processing**

Data Were Analyzed Using Nominal And Ordinal Scales. Independent Variables Included The Availability Of Rehabilitation Methods (Kinesitherapy, TENS, Hydrotherapy, LASER, Traction, Biofeedback Training, PNF, And Others), While Dependent Variables Represented Professional Roles (Doctors, Nurses, Physiotherapists, Health Technicians, And Medical Laboratory Scientists).

The Ordinal Efficiency Levels (Insufficient To Excellent) Were Analyzed Using The Chi-Square (X<sup>2</sup>) Test For The Independent Variables. Fisher's Exact Test Was Used To Validate Results With Small Sample Sizes. Cochran's Q Test Was Applied To Assess Internal Consistency Across Responses. All Statistical Analyses Were Conducted Using The R Programming Language.

# **Ethical Aspects Of Research**

The Study Was Classified As Low-Risk. All Participants Were Informed Of The Study's Objectives, Procedures, And The Voluntary Nature Of Their Participation. Ethical Standards, Including Data Protection And Respondent Anonymity, Were Strictly Followed. Only The Researcher And Thesis Supervisor Had Access To The Data, Which Was Used Solely For Academic Purposes. The Research Did Not Pose Any Physical Or Psychological Risks To Participants, And All Ethical Protocols Were Observed.

# **RESULTS**

Availability Of Rehabilitation Methods In Ibadan And Croatia

# **Overview And Respondent Distribution**

This Section Presents A Comparative Analysis Of The Availability Of Low Back Pain (LBP) Rehabilitation Methods In Hospitals Located In Ibadan, Nigeria, And Rijeka And Opatija, Croatia. Responses Were Collected From A Total Of 101 Healthcare Professionals: 51 From Ibadan And 50 From Croatia. Question 14 Of The Questionnaire Specifically Addressed The Availability Of Various LBP Rehabilitation Methods In Their Respective Hospitals. Each Method Was Assigned A Score Based On Its Recognized Intensity And Frequency Of Use Globally.

# **Scoring Procedure**

Rehabilitation Methods Such As Kinesitherapy And PNF Were Assigned 3 Points Each Due To Their Broad Clinical Effectiveness. Other Methods—TENS, Hydrotherapy, Biofeedback, LASER, Traction, And Specialized Therapies Such As Ergonomics—Were Assigned 2 Points Each. To Maintain Consistency Across Both Countries, Croatian Responses Were Standardized And Translated Into The Same English Categories For Comparative Analysis.

# **Efficiency Categories**

The Total Scores From The Scoring System Were Then Categorized Into Five Efficiency Levels As Shown Below In Table 2.

**Table 2:** Efficiency Categories

Efficiency Level	Score Range
Insufficient	≤ 8 Points
Sufficient	9–10 Points
Good	11–12 Points



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Very Good	13–14 Points
Excellent	≥ 15 Points

# **Frequency Distribution Of Efficiency Levels**

Table 3 Displays The Frequency Of Efficiency Levels Reported By Participants From Ibadan And Croatia. Due To Small Expected Values In Certain Categories, The Chi-Square Test Was Flagged As Potentially Unreliable. As A Result, Fisher's Exact Test Was Used As A Backup To Verify Statistical Accuracy.

**Table 3**: Frequency Distribution Of Efficiency Levels.

Efficiency Level	Ibadan	Croatia
Insufficient	41	24
Sufficient	4	15
Good	4	10
Very Good	0	1
Excellent	2	0

Figure 6 Illustrates A Bar Chart Generated To Visually Represent The Distribution Of Efficiency Levels Across Ibadan And Croatian Hospitals.

**Figure 6**: Comparison Of Efficiency Levels Of LBP Rehabilitation Methods As Reported By Healthcare Professionals In Ibadan And Croatia.



The Frequency Distribution And Bar Chart Further Illustrate The Disparity Between The Two Countries. A Large Proportion Of Respondents In Ibadan Fall Under The "Insufficient" Category, While Croatian Responses Are More Spread Across "Sufficient" And "Good" Categories. This Reinforces The Earlier Statistical Findings And Suggests That Healthcare Infrastructure, Access To Training, Or Investment In Equipment May Differ Markedly Between The Countries.



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# **Statistical Tests For Country Comparison**

# Pearson's Chi-Squared Test

Table 4: Pearson's Chi-Squared Test

Test Statistic (X <sup>2</sup> )	16.378
Degrees Of Freedom ( <i>Df</i> )	4
P-Value	0.0026

Table 4 Illustrates The Chi-Square Test Conducted On Low Back Pain (LBP) Rehabilitation Methods Between

Hospitals In Ibadan, Nigeria, And Those In Rijeka And Opatija, Croatia Reveals A Statistically Significant Difference In The Distribution Of Rehabilitation Efficiency Levels Between Ibadan And Croatia. The P-Value Is Less Than 0.05 And This Result Suggests That The Observed Variation Is Unlikely To Have Occurred By Chance.

The Particularly High Concentration Of "Insufficient" Ratings In Ibadan And The More Balanced Spread In Croatia Indicates Remarkable Disparities In Service Provision. However, As Predicted, There Was A Warning Message Indicating That Some Expected Cell Frequencies Were Too Low For The Chi-Square Approximation To Be Valid.

Fisher's Exact Test Was Employed As A More Reliable Alternative To Back It Up. The *Fisher's Exact Test For Count Data* Does Not Rely On Large-Sample Assumptions Of Chi-Square And It Is Suitable For Contingency Tables With Small Expected Frequencies As Encountered In The Survey Data.

#### **Fisher's Exact Test For Count Data**

Table 5: Fisher's Exact Test For Count Data

Test	Result
P-Value	0.00085
Alternative Hypothesis	Two-Sided

In Table 5, The Significant P-Value Of Approximately 0.0009 Further Confirms The Existence Of A Notable Difference In The Efficiency Of LBP Rehabilitation Services Between The Two Countries. The Dual Application Of Tests Solidifies The Reliability Of The Findings.

There Is A Consistency In Results Between The Chi-Square Test And Fisher's Exact Test Contributing To The Conclusion That There Is A Statistically Significant Association Between The Country Of Practice And The Reported LBP Rehabilitation Efficiency Levels.

While The Chi-Square Test Highlighted This Association, Fisher's Test Addressed Its Limitations, Particularly In Categories Such As "Very Good" And "Excellent," Where The Observed Frequencies Were Sparse.





# Prevalence Of Individual Rehabilitation Methods (Cochran's Q Test)

To Examine The Variability In Method Availability Across Individual Facilities Within Croatia And Ibadan City In Nigeria, Cochran's Q Test Was Applied (See Table 6 And 7). At A 5% Level Of Significance, The P-Value Of 0.0705 Is Slightly Above The Acceptance Region, Indicating No Statistically Significant Differences In The Frequency Of Use Across The Methods Within Ibadan Facilities. This Could Suggest A More Standardized But Limited Approach To Rehabilitation In Ibadan Hospitals.

#### **Results For Ibadan**

**Table 6:** Results For Ibadan

Q	13.07
Degrees Of Freedom (Df)	7
P-Value	0.0705

At A 5% Level Of Significance, The P-Value Of 0.0705 Is Slightly Above The Acceptance Region, Indicating No Statistically Significant Differences In The Frequency Of Use Across The Methods Within Ibadan Facilities. This Could Suggest A More Standardized But Limited Approach To Rehabilitation In Ibadan Hospitals.

#### **Results For Croatia**

Table 7: Results For Croatia

Q	22.13
Degrees Of Freedom (Df)	7
P-Value	0.0024

There Is A Statistically Significant Variation In The Usage Of Rehabilitation Methods Across Facilities In Croatia As The P-Value Of 0.0024 Is Less Than 0.05. This Variability From The Cochran's Test May Suggest More Personalized Or Facility-Specific Decision-Making In Therapy Implementation, Potentially Pointing To A More Adaptive And Resource-Rich Rehabilitation Ecosystem.

These Results From The Test Also Suggest That Croatian Hospitals Do Not Only Offer More Rehabilitation Methods But They Also Show Greater Variation In Their Application, Possibly Reflecting Patient-Centered Or Specialized Care Models.

# DISCUSSION

The Healthcare System In Oyo State, Nigeria, Operates Under The Country's Three-Tier Structure: Federal (Tertiary), State (Secondary), And Local (Primary). Primary Healthcare Centers Provide Front-Line Services, Including Immunizations, Basic Treatment Of Minor Ailments, Preventive Health Programs And Prenatal Services. State-Level Hospitals Offer More Specialized Care, While Federal Institutions, Such As Teaching Hospitals, Provide Advanced Diagnostic And Therapeutic Services.

Ibadan, The Capital Of Oyo State And One Of The Largest Cities In West Africa, Is Home To A Broad Mix Of Public, Private, Community-Based, And Specialist Health Institutions. A Key Example Is The University

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College Hospital (UCH), One Of Nigeria's Premier Tertiary Health Facilities And One Of The Five Hospitals Surveyed In This Research. It Houses A Department Of Physiotherapy And Offers Specialised Rehabilitation

Surveyed In This Research. It Houses A Department Of Physiotherapy And Offers Specialised Rehabilitation Services For Musculoskeletal Conditions Like LBP. Despite The Availability Of Physiotherapy And Rehabilitation Services Across Ibadan, Access Remains Limited—Particularly In Rural Areas And Among Low-Income Populations.

Findings From Odebiyi Et Al. (2007) Align With The Results Of This Study: Many Public Hospitals In Southwestern Nigeria, Including Ibadan, Lack Properly Equipped Physiotherapy Units And Adequate Personnel. While Some Facilities Apply Methods Consistent With International Standards, Their Implementation Is Constrained By Limited Resources. Tertiary Hospitals Like UCH Offer More Comprehensive Rehabilitation Services, Whereas Private Clinics Often Function On A Fee-For-Service Model, Limiting Access For The Under-Served.

The Data Gathered For This Research Show That Many Healthcare Professionals In Ibadan Are Familiar With And Use Rehabilitation Methods Like Kinesitherapy, TENS, And Traction. However, More Advanced Methods Such As Hydrotherapy, LASER, Thermotherapy, And PNF Are Much Less Commonly Known Or Applied. Less Than 2% Of Respondents Indicated Awareness Of Methods Like Ergonomics Or Phonophoresis.

# **Statistical Evidence Of Disparity**

The Chi-Square Test Revealed A Statistically Significant Difference (P = 0.0026) Between The Rehabilitation Efficiency Levels In Ibadan And Croatia. To Confirm This Result—Particularly Due To Small Expected Values In Some Categories—Fisher's Exact Test Was Also Conducted, Producing A Highly Significant P-Value Of 0.00085. Together, Both Tests Suggest That The Country Where Healthcare Professionals Practice Significantly Influences The Quality And Efficiency Of The Rehabilitation Services They Report.

Only A Small Number Of Hospitals In Ibadan Fell Into The "Very Good" Or "Excellent" Categories. Advanced Rehabilitation Techniques—Like LASER Therapy, Hydrotherapy, And Biofeedback—Were More Frequently Reported In Croatian Hospitals, Pointing To A Disparity In Both Resource Availability And Professional Training.

# Variability Within Countries

The Cochran's Q Test Was Used To Explore Variation Within Each Country. In Ibadan, The P-Value Of 0.0705 Indicated No Statistically Significant Variability. While This Could Imply Consistency, It More Likely Reflects Limited Access To A Narrow Range Of Rehabilitation Methods.

By Contrast, Croatian Hospitals Showed Statistically Significant Variability In Available Methods (P = 0.0024). This Suggests A More Diverse And Adaptable Healthcare System Where Resources And Treatment Approaches May Vary Based On Each Hospital's Specialization And Capacity.

Although The Statistical Methods Applied Produced Reliable Results, A Limitation Of The Study Remains: The Reliance On Self-Reported Data. As With Many Cross-Sectional Studies, There Is A Potential For Recall Bias Or Misinterpretation Of The Questions, Which May Affect Accuracy.

# **CONCLUSION**

This Research Explored The Current State Of Rehabilitation Practices For Patients With Low Back Pain (LBP) In Hospitals Across Ibadan, Oyo State, Nigeria. Given The Growing Prevalence Of LBP And The Urgent Need For Effective, Evidence-Based Rehabilitation, The Study Assessed The Availability Of Diagnostic Tools, Therapeutic Interventions, And Systemic Barriers To Optimal Care. For Broader Context, Hospitals In Rijeka And Opatija, Croatia, Were Examined As International Benchmarks.

The Findings Revealed That While Some Physiotherapy Services Exist In Tertiary And Private Hospitals In Ibadan, Many Healthcare Facilities Lack Structured, Well-Resourced Rehabilitation Programs. Frequently

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Used Methods Such As Kinesitherapy, TENS, And Traction Are Applied Inconsistently, Often Depending On The Availability Of Equipment And Staff Expertise. Cultural Beliefs, Delayed Help-Seeking Behaviour, And Limited Public Awareness Further Impact The Quality Of Care And Rehabilitation Outcomes.

These Results Highlight The Need For Targeted Investments In Rehabilitation Infrastructure And Continuous Professional Development For Healthcare Workers. Hospitals At The Primary, Secondary, And Tertiary Levels Must Be Equipped With Modern Rehabilitation Tools And Guided By Standardized Treatment Protocols. Public Education Campaigns Should Promote Early Diagnosis, Preventive Strategies, And Home-Based Self-Care Practices.

Despite Its Valuable Contributions, This Study Is Not Without Limitations. Its Cross-Sectional Design And Reliance On Self-Reported Data May Introduce Bias Or Limit The Generalisability Of Findings. Nevertheless, The Comparative Approach Used In This Research Provides Actionable Insights And A Foundation For Future Improvement.

In Conclusion, Rehabilitation Services For Patients With Low Back Pain In Ibadan Remain Underdeveloped And Fall Below International Standards. Bridging This Gap Will Require Coordinated Action In Healthcare Policy, Workforce Training, Facility Upgrades, And Patient Education. Enhanced Rehabilitation Practices Will Not Only Improve Clinical Outcomes But Also Promote Better Quality Of Life And Economic Productivity For Individuals Affected By Low Back Pain In Nigeria.

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# **APPENDICES**

**English Version:** Https://Forms.Gle/Ntownvxkkqb6htnj9

LOW BACK PAIN(LUMBAGO)

Warm Greetings!

Thank You For Taking The Time To Participate In This Survey.

I Am Faith Chinnonye Okere, A Final Year Student Of Undergraduate Studies Of Physiotherapy. This Form Is Designed To Gather Your Valuable Knowledge And Experiences To Help Me Decide On My Final Year Page 3627

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Project Topic. Your Responses Will Be Very Instrumental In Creating A Relevant, Impactful And Well-Aligned Project.

The Survey Should Take Approximately 5minutes To Complete And Your Input Is Greatly Appreciated. Rest Assured, All Responses Will Remain Confidential And Will Only Be Used For The Purpose Of This Study. Thank You For Your Support!

Sincerely,

#### Faith.

- 1. What Is Your Profession?
- 2. For How Long Have You Been Officially Working In Your Field?
- 3. At Your Primary Place Of Work, How Often Do You Come Across Low Back Pain Cases?
- 4. Low Back Pain Is Most Commonly Seen Amongst What Gender?
- 5. Amongst What Age Range Is Low Back Pain Mostly Diagnosed?
- 6. Most Low Back Pain Patients Are Mostly?
- 7. From Your Experiences So Far, Low Back Pain Is Mostly Diagnosed In People With What Weight Range?
- 8. From Your Experiences So Far, Can You Say Living In An Urban Or Rural Area Plays A Part In The Likeliness, Of Being Affected By Chronic Low Back Pain?
- 9. At Your Place Of Work, Do You Have Assessment Methods For Low Back Pain?
- 10. Which Of These Methods Is Used To Diagnose Low Back Pain?
- 11. Are You Aware About Public Health Prevention Programmes For Low Back Painput In Place To Help With Reduction In Cases Of Low Back Pain?
- 12. If You Answered 'Yes' To The Previous Question, What Prevention Programmes Are You Aware Of?
- 13. From Your Experience So Far, What Is The Usual Duration Of Recovery For A Low Back Pain Patient Undergoing Rehabilitation?
- 14. What Rehabilitation Programmes Do You Have For Rehabilitation Of Low Back Pain?
- 15. From Your Experiences So Far, What Are The Outcomes Of Rehabilitation In Patients Of Low Back Pain?
- 16. Would It Be Okay To Contact You For Further Information That May Be Needed To Proceed With This Project?
- 17. If Yes, Kindly Type Your Active Phone Number.

Croatian Version: Https://Forms.Gle/ZHB18rHTyB51PYo29

KRIŽOBOLJA (LUMBAGO)

Poštovani!

Zahvaljujem Vam Što Ste Odvojili Vrijeme Za Sudjelovanje U Ovoj Anketi.

Moje Ime Je Faith Chinnonye Okere, Studentica Sam Završne Godine Prijediplomskog Stručnog Studija Fizioterapija, Fakulteta Zdravstvenih Studija, Sveučilišta U Rijeci. Ovom Anketom Željela Bih Prikupiti Vaše Znanje I Iskustvo Koje Bi Mi Pomoglo U Pisanju Završnog Rada. Vaši Će Odgovori Biti Će Mi Od Velike Pomoći U Pisanju Završnog Rada.

Ispunjavanje Ankete Trebalo Bi Trajati Otprilike 5 Minuta. Svi Će Odgovori Ostati Povjerljivi I Koristit Će Se Samo U Svrhu Pisanja Završnog Rada. Hvala Vam Na Podršci!

Srdačan Pozdrav,	



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# Faith.

- 1. Što Ste Po Zanimanju?
- 2. Koliko Dugo Radite U Struci?
- 3. Koliko Često Se Susrećete Sa Križoboljom Na Vašem Radnom Mjestu?
- 4. Kod Kojeg Spola Se Najčešće Javlja Bol U Križima?
- 5. U Kojoj Životnoj Dobi Se Najčešće Javlja Križobolja
- 6. Većina Bolesnika S Križoboljom Zaposleni Su U
- 7. Iz Vaših Dosadašnjeg Iskustva, Križobolja Se Uglavnom Dijagnosticira Kod Osoba S Rasponom Težine?
- 8. Iz Vašeg Dosadašnjeg Iskustva, Možete Li Reći Da Život U Urbanom Ili Ruralnom Području Igra Ulogu U Vjerojatnosti Da Će Pacijenti Biti Pogođeni Kroničnom Boli U Donjem Dijelu Leđa?
- 9. Imate Li Na Svom Radnom Mjestu Metode Procjene Križobolje?
- 10. Koja Se Od Ovih Metoda Koristi Za Dijagnosticiranje Križobolje?
- 11. Jeste Li Upoznati S Javnozdravstvenim Preventivnim Programima Za Bol U Donjem Dijelu Leđa Koji Su Uspostavljeni Kako Bi Pomogli U Smanjenju Slučajeva Boli U Donjem Dijelu Leđa?
- 12. Ako Ste Na Prethodno Pitanje Odgovorili 'Da', Za Koje Preventivne Programe Znate?
- 13. Prema Vašem Dosadašnjem Iskustvu, Koje Je Uobičajeno Trajanje Oporavka Za Pacijenta S Križoboljom Koji Je Na Rehabilitaciji?
- 14. Koje Rehabilitacijske Programe Imate Za Liječenje Križobolje?
- 15. Iz Vaših Dosadašnjih Iskustava, Kakvi Su Ishodi Rehabilitacije Kod Bolesnika S Križoboljom?
- 16. Bi Li Bilo U Redu Da Vas Kontaktiram Za Dodatne Informacije Koje Bi Mogle Biti Potrebne Za Pisanje Ovog Završnog Rada?
- 17. Ako Da, Upišite Svoj Aktivni Broj Telefona.

# **BIOGRAPHY**

Faith Chinnonye Okere Is A 25-Year-Old Final-Year Undergraduate Student Of Physiotherapy At Sveučilište U Rijeci, Rijeka, Croatia. Originally From Imo State, Nigeria, She Was Born And Raised In Ibadan, Oyo State. Throughout Her Academic Journey, She Has Demonstrated Resilience And Adaptability, Completing Her Physiotherapy Program With Croatian As The Language Of Instruction.

Passionate About Personal Growth And Diverse Interests, She Is Currently Building A Network Marketing Business While Nurturing Her Deep Love For Photography. Her Long-Term Aspirations Include Becoming An Orthopaedic Physiotherapist, A Globally Renowned Network Marketing Professional, And An International Photographer.

She Volunteered During The 2025 PREOKRET Festival In Rijeka, Reflecting Her Commitment To Community And Cross-Cultural Engagement. Known For Being Observant, Hardworking, Resilient, And Consistent, She Also Enjoys Cooking, Nature Photography, And Bowling In Her Leisure Time.