INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

ADHERENCE TO EVIDENCE-BASED PRACTICE: A SURVEY OF PHYSIOTHERAPISTS' CURRENT PRACTICES FOR MANAGING LUMBAR DISC HERNIATION

Original Research

Misbah Binte Ilyas[1]*, Hifza Arif[2], Jawad Ali[3], Aqsa Nazeer[4], Faria Aslam Khan[4], Khansa Bibi[4], Muhammad Shehryar[4]
[1]Lecturer, Helping Hand Institute of Rehabilitation Sciences, Mansehra, Pakistan.
[2]Teaching Assistant, Helping Hand Institute of Rehabilitation Sciences, Mansehra, Pakistan.
[3]Assistant Professor, Helping Hand Institute of Rehabilitation Sciences, Mansehra, Pakistan.
[4]Physiotherapist, Helping Hand Institute of Rehabilitation Sciences, Mansehra, Pakistan.
Corresponding Author: Misbah Binte Ilyas, Lecturer, Helping Hand Institute of Rehabilitation Sciences, Mansehra, Pakistan, misbah.ilyas@hhirs.edu.pk
Acknowledgement: The authors thank all participating physiotherapists for their valuable time and contribution to this study.

Conflict of Interest: None
Grant Support & Financial Support: None

ABSTRACT

Background: Lumbar disc herniation (LDH) is a prevalent musculoskeletal disorder that impairs mobility, causes persistent pain, and reduces quality of life. It contributes to significant clinical and socioeconomic burdens worldwide. Evidence-Based Practice (EBP) is essential for delivering optimal patient care; however, in countries like Pakistan, the degree to which physiotherapists integrate EBP into LDH management remains unclear. Understanding adherence patterns is crucial for identifying gaps and enhancing clinical outcomes.

Objective: To evaluate the adherence of physiotherapists to Evidence-Based Practice in the management of lumbar disc herniation.

Methods: A cross-sectional survey was conducted among physiotherapists working in hospitals, rehabilitation centers, and private clinics across Pakistan. Data collection was performed both online via Google Forms and through in-person distribution. A total of 531 questionnaires, based on a literature-modified Evidence-Based Practice Questionnaire, were disseminated using a non-probability convenience sampling approach. Inclusion criteria were Pakistan-based clinical physiotherapists with a minimum of one year of experience treating LDH. Physiotherapists working exclusively in academia or outside Pakistan were excluded. Out of 357 returned responses, 312 met the inclusion criteria and were analyzed using SPSS version 21. Descriptive statistics summarized demographic and practice-related data, and chi-square tests assessed associations, with significance set at $p<0.05$.

Results: Among the participants, 57.4% were male, with a mean age of 28.94 ± 5.10 years. Most (76.9%) had 1–5 years of clinical experience. EBP was reported as being used frequently by 50.6% and always by 36.9% of respondents. Knowledge levels were rated as good by 55.1% and excellent by 26.9%. Key barriers included limited access to recent research (39.1%) and time constraints (42.6%).

Conclusion: Physiotherapists in Pakistan demonstrate awareness of EBP for LDH management; however, consistent application remains suboptimal, necessitating targeted strategies to bridge the gap between knowledge and practice.

Keywords: Adherence, Evidence-Based Practice, Lumbar Disc Herniation, Musculoskeletal Disorders, Pakistan, Physical Therapy, Professional Practice.

INTRODUCTION

Lumbar disc herniation (LDH) is a prevalent spinal condition with considerable implications for individuals' health, work capacity, and overall quality of life (1). Global estimates suggest that LDH affects approximately 1–3% of adults annually, with about 90% of disc herniations occurring in the lumbar region, which bears the greatest mechanical load of the body (2,3). The intervertebral disc, composed of the outer annulus fibrosus (AF) and the inner nucleus pulposus (NP) connected by cartilaginous endplates, is largely avascular and thus possesses limited regenerative capacity when subjected to abnormal biomechanical stresses (4). Herniation refers to the protrusion of disc material beyond the annular lining into the spinal canal, most commonly at the L4–L5 and L5–S1 levels (5,6). Epidemiological findings indicate that men are more frequently affected than women, with the mean age of onset around 41 years (7). In China, LDH prevalence is reported at 7.62% across all demographics, while in the United States, annual lower back pain prevalence is 10–30%, with a lifetime prevalence between 65% and 80% (8). Common causes include age-related degeneration of the annulus fibrosus, trauma, repetitive lifting, straining, and sedentary lifestyles (9). Pathologically, LDH may present as disc bulging, protrusion, extrusion, or sequestration (10), producing symptoms ranging from asymptomatic cases to severe radiculopathy, sciatica, sensory deficits, or motor weakness (11).

In clinical management, Evidence-Based Practice (EBP) plays a crucial role in improving patient outcomes by integrating the best available research evidence with clinical expertise and patient preferences (12,13). The EBP process involves formulating a focused clinical question, identifying and critically appraising relevant literature, and applying the findings in conjunction with patient values and practitioner experience (14). In physiotherapy, EBP ensures that patient and practice management decisions are grounded in scientifically validated interventions (15,16). The rising availability of high-quality research has advanced the adoption of evidence-based physiotherapy, though access to and application of such evidence remain inconsistent among practitioners (17,18). For LDH, evidence-based physiotherapy typically employs multimodal interventions, including trunk muscle activation, spinal manipulation, soft tissue mobilization, and targeted therapeutic exercises such as clamshells, bridging, lower trunk rotations, straight leg raises, mini squats, spinal extensions, and core stabilization (19,20). Manual therapy, neural mobilization, postural education, and home exercise programs are also integral, aiming to reduce pain, enhance functional capacity, and prevent recurrence (21,22). Mobilization and manipulation have demonstrated short-term pain relief, while progressive strengthening and flexibility training contribute to long-term recovery (7,22). Given the significant prevalence and disabling potential of LDH, coupled with the proven benefits of EBP in physiotherapy, there is a pressing need to assess physiotherapists' adherence to evidence-based guidelines in managing this condition. This study aims to evaluate the extent to which physiotherapists implement EBP principles in the treatment of lumbar disc herniation, with the objective of enhancing clinical effectiveness, optimizing patient recovery, and reducing the likelihood of symptom recurrence.

METHODS

This cross-sectional survey was conducted over a six-month period, from December 2024 to May 2025, across various private clinical setups and hospitals in Pakistan. The target population comprised physiotherapists registered with the Pakistan Physical Therapy Association (PPTA). According to the PPTA website at the time of the study, there were approximately 1,645 physiotherapists in the country (23). Using Raosoft® sample size calculator with a 50% assumed response distribution, a 95% confidence interval, and a 5% margin of error, the minimum required sample size was calculated as 312. A non-probability convenience sampling technique was applied. Inclusion criteria were PPTA-registered physiotherapists with at least one year of clinical experience and currently managing patients diagnosed with lumbar disc herniation. Exclusion criteria included physiotherapists not practicing in Pakistan and those working exclusively in academic settings without patient management responsibilities. The instrument used for data collection was a self-structured questionnaire designed to evaluate physiotherapists' adherence to evidence-based practices in managing lumbar disc herniation. The questionnaire development followed procedures described by Muntessu and Qarib Ullah and Jahangir Khan with literature-based modifications to ensure contextual relevance (11,13). The initial draft was refined through expert consultation and a focus group discussion, during which some items were rephrased or removed for clarity and applicability. Pilot testing was conducted with five physiotherapists, each having over two years of clinical experience and currently treating lumbar disc herniation. Feedback from the pilot test confirmed clarity and relevance of the final instrument. The finalized questionnaire was divided into three sections:

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

Demographics and Professional Background (14 items), Self-Reported Adherence to Evidence-Based Practice (7 items), and Barriers to Implementing Evidence-Based Practice in Lumbar Disc Herniation Management (5 items).

Following approval from the relevant institutional ethics review committee and in compliance with the Declaration of Helsinki, the questionnaire was distributed along with an informed consent form. Participation was voluntary, and written consent was obtained from all respondents prior to inclusion. A total of 531 physiotherapists were approached. Of these, 357 responses were received, yielding a response rate of 67.2%. Twenty-seven responses were excluded for reasons including duplication (n=10), less than six months of professional experience (n=7), and responses from physiotherapists based outside Pakistan (n=10). The remaining 330 responses were screened further, and 18 were excluded due to incomplete or missing information, resulting in a final sample size of 312 participants for analysis. Data were entered and analyzed using IBM SPSS Statistics version 21. Descriptive statistics were used to summarize demographic and professional characteristics. Continuous variables were presented as mean ± standard deviation, while categorical variables were expressed as frequencies and percentages. Normality of data distribution was assessed using the Kolmogorov–Smirnov and Shapiro–Wilk tests, with a p-value of <0.05 indicating non-normal distribution. Given the non-parametric nature of the data, associations between categorical variables were examined using the Chi-square test, with statistical significance set at $p<0.05$.

RESULTS

The mean age of the participating physiotherapists was 28.94 ± 5.10 years. Among the 312 respondents, 179 (57.4%) were male and 133 (42.6%) were female. The majority held a Doctor of Physical Therapy (DPT) degree (96.2%), while 3.8% had a Bachelor of Science in Physical Therapy (BSPT) degree. Most participants had between 1–5 years of clinical experience (76.9%), followed by 6–10 years (15.4%), 16–20 years (3.8%), 11–15 years (2.9%), and 21–25 years (1.0%). Regarding current work settings, 47.1% worked in private clinics, 26.3% in rehabilitation centers, and 26.0% in government hospitals, with a small proportion (0.6%) working in both private and government facilities. In terms of roles, 74% were exclusively in clinical practice, 24% combined clinical practice with teaching, and 1.9% worked solely in academia. Professional specialization was most frequently reported in musculoskeletal physiotherapy (32.7%), followed by no specialization (26.9%), neurological physiotherapy (13.8%), cardiopulmonary physiotherapy (9.3%), sports physiotherapy (7.7%), pediatric physiotherapy (6.4%), and women's health physiotherapy (3.2%). Attendance at professional training or workshops on Evidence-Based Practice (EBP) was reported by 20.8% of participants, while 79.2% had not received such training. Self-assessed EBP knowledge was rated as "Good" by 55.1%, "Excellent" by 26.9%, "Average" by 17.3%, and "Poor" by 0.6%. Regarding sources for staying updated on EBP, 22.1% reported using a combination of research journals, workshops, and online databases; 18.6% relied on professional courses or workshops; 14.7% used research journals alone; 14.4% used PubMed or similar databases; 14.4% consulted colleagues or mentors; and 15.7% selected "all of the above." Clinical practice guidelines combined with research articles were the most common resources for decision-making (49.4%), followed by clinical practice guidelines alone (35.6%), expert opinion (9.3%), and research articles alone (5.8%).

In self-reported adherence to EBP for lumbar disc herniation management, 50.6% reported using it often, 36.9% always, 10.9% rarely, and 1.6% never. Most participants searched for relevant evidence monthly (51.3%), followed by weekly (31.7%), daily (7.7%), and never (9.3%). Electronic database searches followed a similar pattern, with monthly searches (49.7%) most common. Critical appraisal of literature was performed monthly by 45.5% of respondents, weekly by 31.7%, daily by 3.5%, and never by 19.2%. Integration of research findings into clinical expertise occurred monthly in 42.9%, weekly in 29.5%, daily in 15.7%, and never in 11.9%. Patient preferences were considered monthly by 36.5%, weekly by 30.4%, daily by 26.6%, and never by 6.4%. Published research on lumbar disc herniation was read monthly by 50%, weekly by 27.9%, daily by 7.4%, and never by 14.7%. Informal discussions about research occurred monthly in 44.2%, weekly in 29.2%, daily in 14.1%, and never in 12.5%. Perceived barriers to implementing EBP included limited access to recent research (agreed by 39.1%), time constraints (42.6%), lack of organizational support (36.9%), difficulty interpreting research (30.4%), and insufficient training (38.8%). A considerable proportion remained neutral on these issues, indicating possible uncertainty or variability in experience. Analysis of EBP use by specialty showed musculoskeletal physiotherapy as the most frequent adopter (13.1%), followed by neurological (5.1%) and sports (4.2%) physiotherapy, while cardiopulmonary (4.8%), pediatric (2.2%), and women's health (0.6%) physiotherapy showed lower usage rates. No significant correlation was found between EBP application and physiotherapy specialization ($p = 0.235$).

When EBP use was examined by years of experience, physiotherapists with 1–5 years of experience reported the highest application rates, while usage declined with increasing years in practice. No statistically significant association was found between EBP use and

clinical experience (p = 0.534). However, EBP use was significantly associated with clinical setting (p = 0.031). Physiotherapists working in private clinics reported the highest rates of "always" applying EBP (19.9%), followed by those in rehabilitation centers (11.9%) and government hospitals (8.7%). Quantitative analysis of the relationship between perceived barriers and EBP adherence revealed that limited access to recent research was most frequently reported among participants who adhered to EBP "always" (61 participants, 19.6% of the total) or "often" (56 participants, 17.9%), with these respondents selecting "agree" or "strongly agree" on this barrier. Similarly, time constraints were a notable concern among those who reported "always" (60 participants, 19.2%) or "often" (65 participants, 20.8%) applying EBP, suggesting that even frequent users perceive practical challenges in maintaining consistent evidence-based practice. In contrast, those who reported "rarely" or "never" applying EBP showed proportionally higher agreement with barriers such as limited access, lack of organizational support, and insufficient training, indicating that these factors may disproportionately hinder lower-frequency EBP users. Overall, while the data suggest that high-frequency users also encounter barriers, the impact appears more pronounced among those with lower adherence levels, implying a potential compounding effect of access, time, and institutional support on EBP uptake.

Table 1: Demographic and Professional Characteristics of Participating Physiotherapists

Variables	Frequency
Gender	
Male	179 (57.4%)
Female	133 (42.6%)
Age	Mean ± S. D: 28.94 ± 5.100
Current Working Facility	
Private Clinic	(47.10%)
Government Hospital	(26.00%)
Rehabilitation Center	(26.30%)
Degree Level	
BS-PT	300 (96.2%)
DPT	12 (3.8%)
Working Experience	
1–5 Years	(76.90%)
6–10 Years	(15.40%)
11–15 Years	(2.90%)
16–20 Years	(3.80%)
21-25 Years	(1.00%)
Have you attended any professional training or workshops on evidence-based practice?	
Yes	(79.20%%)
No	(20.80%)

Table 2: Self-Reported Adherence to Evidence-Based Practice in the Management of Lumbar Disc Herniation

Questions	Responses	Frequency (%)
Looked for relevant evidence once you formulated the question regarding the management of lumbar disc herniation.	Daily	24(7.7%)
	Weekly	99(31.7%)
	Monthly	160(51.3%)
	Never	29(9.3%)
Searched in an electronic database for literature on lumbar disc herniation management.	Daily	19(6.1%)
	Weekly	99(31.7%)
	Monthly	155(49.7%)
	Never	39(12.5%)

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

Questions	Responses	Frequency (%)
Critically evaluated all the literature you found on lumbar disc herniation to determine its methodological quality.	Daily	11(3.5%)
	Weekly	99(31.7%)
	Monthly	142(45.5%)
	Never	60(19.2%)
Integrated research findings related to lumbar disc herniation with your expertise in physiotherapy.	Daily	49(15.7%)
	Weekly	92(29.5%)
	Monthly	134(42.9%)
	Never	37(11.9%)
Took into account your patients' preferences when making clinical decisions related to lumbar disc herniation management	Daily	83(26.6%)
	Weekly	95(30.4%)
	Monthly	114(36.5%)
	Never	20(6.4%)
Read published research reports on the management of lumbar disc herniation.	Daily	23(7.4%)
	Weekly	87(27.9%)
	Monthly	156(50%)
	Never	46(14.7%)
Shared and discussed literature on lumbar disc herniation informally with others in your profession.	Daily	44(14.1%)
	Weekly	91(29.2%)
	Monthly	138(44.2%)
	Never	39(12.5%)

Table 3: Shows the Barrier to Implementing EBP In LDH Management

Questions	Responses	Frequency (%)
Limited access to recent research on lumbar disc herniation is a barrier to EBP.	1 = Strongly Disagree	15(4.8%)
	2 = Disagree	42(13.5%)
	3 = Neutral	113(36.2%)
	4 = Agree	122(39.1%)
	5 = Strongly Agree	20(6.4%)
|Time constraints prevent me from applying EBP in lumbar disc herniation management.	1 = Strongly Disagree	13(4.2%)
	2 = Disagree	66(21.2%)
	3 = Neutral	90(28.8%)
	4 = Agree	133(42.6%)
	5 = Strongly Agree	10(3.2%)

Questions	Responses	Frequency (%)
Lack of organizational support hinders my adherence to EBP in treating lumbar disc herniation.	1 = Strongly Disagree	17(5.2%)
	2 = Disagree	64(20.5%)
	3 = Neutral	88(28.8%)
	4 = Agree	115(36.9%)
	5 = Strongly Agree	28(9.0%)
Difficulty in interpreting research results reduces my ability to implement EBP for lumbar disc herniation.	1 = Strongly Disagree	22(7.1%)
	2 = Disagree	69(22.1%)
	3 = Neutral	110(35.3%)
	4 = Agree	95(30.4%)
	5 = Strongly Agree	16(5.1%)
Insufficient training in EBP methods affects my practice in lumbar disc herniation management.	1 = Strongly Disagree	17(5.4%)
	2 = Disagree	70(22.4%)
	3 = Neutral	83(26.6%)
	4 = Agree	121(38.8%)
	5 = Strongly Agree	21(6.7%)

Table 4: Association of EBP with Clinical Setting

Association of EBP with Clinical Setting	Responses	Frequency (%)
Private	Always	62(19.9%)
	Often	67(21.5%)
	Rarely	18(5.8%)
	Never	0(0.0%)
Government Hospital	Always	27(8.7%)
	Often	44(14.1%)
	Rarely	7(2.2%)
	Never	3(1.0%)
Rehabilitation Center	Always	37(11.9%)
	Often	37(11.9%)
	Rarely	8(2.6%)
	Never	0(0.0%)
Both Private & Government Hospitals	Always	0(0.0%)
	Often	2(0.6%)
	Rarely	0(0.0%)

Association of EBP with Clinical Setting	Responses	Frequency (%)
	Never	0(0.0%)
	Often	8(2.6%)
	Rarely	1(0.3%)
	Never	2(0.6%)

Table 5: Relationship between perceived barriers and EBP adherence frequency

Barrier: Limited access to research	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Always	5	10	40	55	6
Often	7	18	52	50	6
Rarely	3	11	15	12	3
Never	0	3	6	5	5
Barrier: Time constraints	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Always	5	15	20	55	5
Often	6	30	50	60	5
Rarely	2	15	15	15	3
Never	0	6	5	3	1

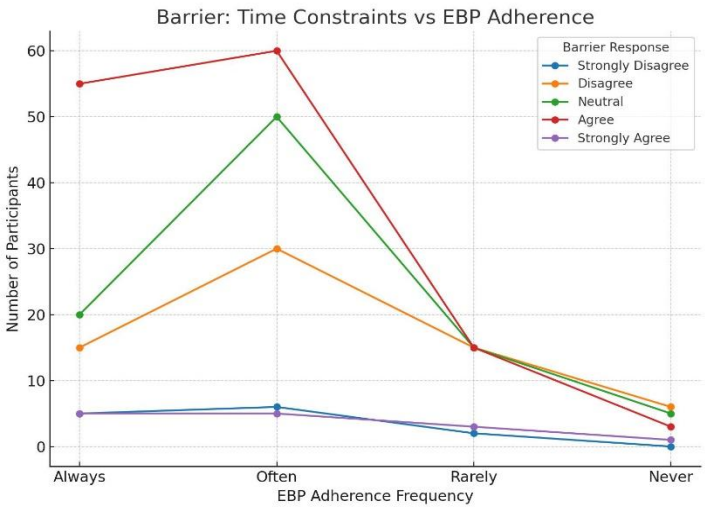

Figure 2 Barrier: Time Constraints vs EBP Adherence

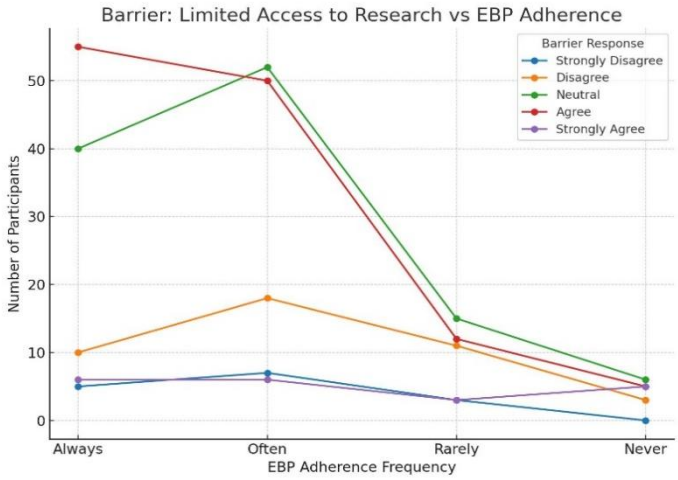

Figure 2 Barrier: Limited Access to Research vs EBP Adherence

DISCUSSION

The present study demonstrated that physiotherapists in Pakistan exhibited a generally positive adherence to Evidence-Based Practice (EBP) in the management of lumbar disc herniation (LDH), with 50.6% reporting frequent use and 36.9% indicating consistent application. This level of adherence reflects a stronger commitment to integrating research-based interventions compared to several previous reports in other musculoskeletal conditions, where lower proportions of practitioners followed established clinical practice guidelines. The findings suggest that LDH management may be an area in which physiotherapists in Pakistan are more inclined to apply EBP principles, possibly due to its high prevalence and established evidence base for non-invasive interventions. When compared with earlier studies conducted in similar contexts, the current results show a more detailed assessment of knowledge levels, distinguishing between excellent, good, average, and poor understanding (21,22). This breakdown revealed that 26.9% of respondents rated their knowledge as excellent and 55.1% as good, while only 0.6% reported poor knowledge. These proportions suggest an improvement in awareness and understanding, potentially reflecting enhancements in academic training, exposure to research during undergraduate

studies, and continuing professional development programs (23). The inclusion of an "excellent" category in the assessment may also have provided a more refined measurement of competence than earlier research, allowing a clearer differentiation of skill levels.

Comparison with findings from studies in other countries indicates notable disparities in both knowledge and practice. While some international research reported positive attitudes but poor practical application due to barriers such as lack of time, limited access to resources, and insufficient research skills, the present study revealed relatively higher EBP integration. Despite this, the same barriers—particularly time constraints and limited access to recent research—remained prominent (24). These shared challenges point to structural and systemic factors that transcend geographical boundaries, suggesting that even where knowledge is strong, logistical and institutional support remains a critical determinant of implementation. The influence of clinical setting was also evident in the results, with physiotherapists working in private clinics and rehabilitation centers demonstrating higher rates of consistent EBP use compared to those in government hospitals. This may reflect differences in workload, resource availability, or institutional culture (25). However, the lack of a significant relationship between years of clinical experience and EBP adherence suggests that exposure to evidence-based principles during initial training, rather than accumulated experience, may play a stronger role in shaping practice patterns. A key strength of this study lies in its contribution to the limited body of literature on EBP adherence among physiotherapists in Pakistan, specifically in the context of LDH management. The use of a literature-modified and pilot-tested questionnaire enhanced the content validity of the findings, while the relatively large sample size improved representativeness. Furthermore, the study not only quantified adherence but also examined perceived barriers, providing a multidimensional understanding of the issue.

Nevertheless, the study faced limitations that should be acknowledged. Due to resource and time constraints, equal representation from all regions of Pakistan was not achieved, and the reliance on online data collection may have introduced selection bias toward physiotherapists with internet access and digital literacy. The self-reported nature of the questionnaire may also have resulted in overestimation of adherence rates due to social desirability bias. Additionally, while the study identified barriers to EBP implementation, it did not quantitatively analyze their predictive effect on adherence patterns, which could have provided deeper insight into intervention priorities. The findings have several implications for clinical practice and future research. Strengthening institutional support for EBP through the provision of protected time for evidence review, improved access to high-quality research databases, and targeted training programs could enhance both the consistency and quality of application. Regular workshops, structured mentorship programs, and integration of updated clinical practice guidelines into workplace policies may further support the transition from awareness to habitual practice. Mobile health applications delivering up-to-date recommendations and structured decision aids could also address some of the identified access barriers. Future research should focus on evaluating the effectiveness of such strategies in improving adherence rates, while also exploring the role of leadership support, interdisciplinary collaboration, and audit-feedback mechanisms in sustaining EBP use. Longitudinal designs could provide valuable insights into how adherence patterns evolve over time and in response to targeted interventions. By addressing the identified gaps, there is potential to further bridge the divide between knowledge and consistent clinical application, ultimately enhancing outcomes for patients with lumbar disc herniation.

CONCLUSION

The study concluded that physiotherapists in Pakistan recognize the importance of Evidence-Based Practice in the management of lumbar disc herniation; however, its consistent integration into routine clinical care remains limited. While awareness and interest in EBP are evident, translating this knowledge into regular practice requires strengthened institutional support, improved access to research resources, and targeted professional development initiatives. These findings underscore the need for strategic interventions to bridge the gap between understanding and application, ultimately enhancing patient outcomes and advancing physiotherapy practice standards in this domain.

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

AUTHOR CONTRIBUTION

Author	Contribution
Misbah Binte Ilyas*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Hifza Arif	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Jawad Ali	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Aqsa Nazeer	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Faria Aslam Khan	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Khansa Bibi	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published
Muhammad Shehryar	Contributed to study concept and Data collection Has given Final Approval of the version to be published

REFERENCES

1. Taşkaya B, Taşkent İ, Çakıllı M, Yılmaz Ö. The Effect of Manual Therapy on Psychological Factors and Quality of Life in Lumbar Disc Herniation Patients: A Single Blinded Randomized Clinical Trial. International Journal of Environmental Research and Public Health. 2024; 21:1234.
2. Zhang C, Zi S, Chen Q, Zhang S. The burden, trends, and projections of low back pain attributable to high body mass index globally: an analysis of the global burden of disease study from 1990 to 2021 and projections to 2050. Frontiers in Medicine. 2024; 11:1469298.
3. Jakaria G, Kuan CS. Muscle Strength, Lumbar Curve, Fear of Movement and Functional Disability among Patients with Lumbar Disc Herniation: A Review. Open Journal of Therapy and Rehabilitation. 2024; 12:28-51.
4. Beall DP, Kim KD, Macadaeg K, Donboli K, Chauhan K, Sowlay M, et al. Treatment Gaps and Emerging Therapies in Lumbar Disc Herniation. Pain Physician. 2024; 27:401.
5. El Melhat AM, Youssef AS, Zebdawi MR, Hafez MA, Khalil LH, Harrison DE. Non-surgical approaches to the management of lumbar disc herniation associated with radiculopathy: A narrative review. Journal of Clinical Medicine. 2024; 13:974.
6. Hossain MS, Akter S, Siddique MAE, Siddique MKB, Reza G, Alom FMM, et al. Multidisciplinary conservative treatment outcomes of in-patient physiotherapy set-up among patients with lumbar disc herniation in Dhaka City, Bangladesh: a retrospective, cross-sectional study. Journal of Multidisciplinary Healthcare. 2023:587-601.
7. Hua F, Xiong J, Zhang H, Xiang J, Huang S. Moxibustion therapy on lumbar disc herniation: an evidence-based clinical practice guideline. Medicine. 2021; 100:e24347.

8. Riaz, Hifza & Ahmad, Muhammad & Shabbir, Hamza & Abbas, Amna & Burki, Subhan-ur-Rehman & Naz, Sania & Khan, Kashmala & Asim, Hafiz. (2025). Virtual Reality Versus Conventional Therapy for Hand Function in Tethered Spinal Cord Compression: A Randomized Controlled Trial. Journal of Health, Wellness and Community Research. e357. 10.61919/7dbs0y46.
9. Zhang AS, Xu A, Ansari K, Hardacker K, Anderson G, Alsoof D, et al. Lumbar disc herniation: diagnosis and management. The American journal of medicine. 2023; 136:645-51.
10. Soguel L, Lapointe A, Burnand B, Desroches S. Descriptive and content analysis of questionnaires used to assess evidence-based practice among dietitians: a systematic review. Journal of the Academy of Nutrition and Dietetics. 2024; 124:80-101.
11. Muntessu DLN, Ghassi HT, Buh FC, Nietho AW, Siewe JR, Mpatoutou MM. Assessment of Evidence-Based Practice (EBP) among physiotherapists in Cameroon: a cross-sectional survey. BMC Medical Education. 2024; 24:332.
12. Alsaadi SM. Beliefs, attitudes, and behaviors of Saudi physiotherapists toward evidence-based practice: A multicenter, cross-sectional study. Saudi Journal of Medicine & Medical Sciences. 2022; 10:227-35.
13. Khan N, Drolet CE, Farrokhi F, Nemani V, Leveque J-CA, Krause K, et al. Clinical Guidelines for the Evaluation and Treatment of Lumbar Disc Herniations: How Accurate is the Internet? World Neurosurgery. 2023; 178:e682-e91.
14. Kibria MG, Sonia NJ, Antara A, Rahman MM, Fazal A. Evidence based physiotherapy management of a patient with chronic low back pain having multiple disc herniation with altered lumber spine: A case report. Int J Physiother Res. 2023; 11:4517-23.
15. Badr M, Elkhawaga H, Fawaz K, Kasem M, Fayez E. Effects of multimodal physical therapy on pain, disability, H-reflex, and diffusion tensor imaging parameters in patients with lumbosacral radiculopathy due to lumbar disc herniation: a preliminary trial. Cureus. 2024; 16:e63501.
16. Kalantaite I. Physiotherapy assessment and intervention for patients with Lumbar Disc Herniation with Radiculopathy: A self-study material for physiotherapy students. 2024.
17. Arshad N, Shabbir M, Khan HMMH, Naeem M, Ayyub A, Zeeshan M. Current Practice of Physical Therapists: An evidence-based practice survey. Pakistan Journal of Medical & Health Sciences. 2023; 17:101-.
18. Hubeishy MH, Rolving N, Poulsen AG, Jensen TS, Rossen CB. Barriers to the use of clinical practice guidelines: a qualitative study of Danish physiotherapists and chiropractors. Disabil Rehabil. 2024;46(1):105-14.
19. Bogaert L, Thys T, Depreitere B, P VANW, Dankaerts W, Brumagne S, et al. Best practice rehabilitation pathway for the management of single and double-level lumbar fusion surgery: a modified Delphi Study. Eur J Phys Rehabil Med. 2023;59(3):377-85.
20. Weis CA, Pohlman K, Draper C, daSilva-Oolup S, Stuber K, Hawk C. Chiropractic Care for Adults With Pregnancy-Related Low Back, Pelvic Girdle Pain, or Combination Pain: A Systematic Review. J Manipulative Physiol Ther. 2020;43(7):714-31.
21. Shabbir, Hamza & Shafi, Muhammad & Mushtaq, Muhammad. (2025). Effects of Inspiratory Muscle Training on Respiratory Strength and Functional Capacity in Post-operative Patients with Scoliosis during Maximum Protection Phase. The Healer Journal of Physiotherapy and Rehabilitation Sciences. 5. 72-80. 10.55735/hjprs.v5i2.366.
22. Walker ED, Gibbs MT, Natoli AR, Jones MD. Navigating complexities: clinicians' experiences and systemic challenges in the implementation of evidence-based practice for chronic low back pain - a qualitative study. Disabil Rehabil. 2025;47(7):1697-707.
23. Parr A, Askin G. Non-radicular low back pain: Assessment and evidence-based treatment. Aust J Gen Pract. 2020;49(11):724-7.
24. Feldman R, Haleva-Amir S, Pincus T, Ben Ami N. Physiotherapists' perceptions of implementing evidence-based practice for patients with low back pain through the Enhanced Transtheoretical Model Intervention: a qualitative study. Physiother Theory Pract. 2023;39(9):1952-63.
25. Miryutova NF, Badalov NG, Minchenko NN, Prilipko NS. [Physiotherapy in rehabilitation of patients with degenerative disk diseases from positions of evidence-based medicine: a literature review]. Vopr Kurortol Fizioter Lech Fiz Kult. 2024;101(2):57-63.

