Physical Education, Health and Social Sciences
https://journal-of-social-education.org
E-ISSN: 2958-5996
P-ISSN: 2958-5988

# Effectiveness of Pilates-Based Exercises in Reducing Pain and Disability in Individuals with Nonspecific Chronic Low Back Pain

**Sobia Hasan[1], Sarah[2], M. Faizan Hassan[3], Adeel Hussain Wagan[4], Ammanullah khan[5]**

[1] Associate Professor Department of Physical Therapy, Iqra University,
ORCID: https://orcid.org/0000-0002-2111-5507, sobia.hasan@iqra.edu.pk
[2] Lecturer Department of Health Physical Education and Sports Sciences,
University of Karachi, shahabsarah079@gmail.com
[3] Sports Physiotherapist and Manager, Jamal Noor Hospital, mrfaizanhassan91@gmail.com
[4] Physiotherapist - Ameen Medical and Dental Centre,
ORCID: https://orcid.org/0009-0003-9297-7256, dradeelhussainw@gmail.com
[5] Assistant Professor, Hamdard University Karachi, doctorkhan1122@yahoo.com

***DOI: https://doi.org/10.63163/jpehss.v3i3.559***

**Abstract**

Chronic low back pain (CLBP) is a widespread musculoskeletal condition that often lacks a clear pathological diagnosis, making effective treatment challenging. Pilates-based exercises have emerged as a promising therapeutic approach, focusing on core stability, posture, and pain relief. This study aims to evaluate physical therapists' perceptions of the efficacy of Pilates-based exercises in managing non-specific CLBP. By collecting insights from experienced practitioners, the study seeks to strengthen the evidence base for Pilates as a rehabilitative intervention. A cross-sectional survey was conducted among licensed physical therapists experienced in using Pilates for CLBP. Using purposive sampling, 184 participants were selected. The survey assessed perceived outcomes of Pilates interventions, and data were analyzed using paired t-tests to determine the significance of reported improvements. Of the 184 participants, 50% were aged 21–30 years, with a near-equal gender distribution (52.7% female, 47.3% male). Most respondents (54.8%) had 0–5 years of physiotherapy experience. Statistical analysis revealed significant improvements ($p < 0.05$) associated with Pilates interventions, including reductions in pain, enhanced core strength, flexibility, functional mobility, and postural alignment. These findings reflect a positive consensus among physical therapists regarding Pilates' role in CLBP management. Physical therapists perceive Pilates-based exercises as an effective treatment for non-specific CLBP. The reported improvements support the integration of Pilates into clinical protocols, emphasizing its value in enhancing patient outcomes. This study contributes to evidence-based practice by highlighting the therapeutic benefits of Pilates from the viewpoint of practicing clinicians.

**Keywords:**

Chronic Low Back Pain, Pilates-Based Exercises, Physical Therapy, Perceived Effectiveness, Pain Management.

## Introduction

Chronic low back pain (CLBP) is a disease that affects the quality of life of many people worldwide. Defined as pain persisting for more than three months, CLBP is often non-specific,

meaning that it lacks a definitive pathological diagnosis [1,2]. Despite extensive research and numerous therapeutic approaches, the management of CLBP remains a challenging endeavor for healthcare providers, particularly physical therapists [3]. In recent years, Pilates-based exercises have become effective interventions for CLBP [4,5]. However, the perceived effects and efficacy of these exercises from the perspective of physical therapists have not been comprehensively explored. This study aims to fill this gap by collecting opinions from physiotherapists on recommending Pilates exercises for painless back pain. There are no symptoms and side effects [6]. This complicates intervention, contributing to persistent challenges in managing LBP used for exercise and rehabilitation. Pilates focuses on strengthening and stabilizing muscles of the body and back to help support and reduce pain, especially lower back pain [7]. Pilates continues to evolve and change to suit various needs and incorporate recommended principles [4]. In terms of low back pain (CLBP), this exercise increases strength, flexibility, and physical awareness [8,9], improves overall physical health, and is believed to improve muscle tone, posture, and reduce discomfort [8]. This study aims to demonstrate the mechanism by which Pilates may affect pain perception and functional efficiency in patients with CLBP and thereby improve our understanding of this treatment [11]. Pilates-based exercise therapy has been shown to be more effective than usual care in improving functional outcomes in patients with low back pain. By synthesizing these findings with insights from practicing physical therapists, the study seeks to offer a deeper understanding of how Pilates works in clinical settings [4]. Physical therapists, as frontline practitioners in the management of musculoskeletal conditions, play a critical role in translating theoretical knowledge into practical interventions [3]. By capturing their expert opinions through a survey, this research aims to bridge the gap between theory and practice and provide insights that can enhance patient care [11]. Back pain is widespread in the adult population [2]. Some studies have shown that up to 23% of the world's adults suffer from chronic low back pain [1]. This population has also shown a one-year recurrence rate of 24% to 80% [6]. Some estimates of lifetime prevalence are as high as 84% in the adult population [2]. The objective of this study is to evaluate the perceived efficacy of Pilates-based exercises in managing non-specific CLBP, based on the experiences of physical therapists. While literature supports the benefits of Pilates in musculoskeletal rehabilitation, few studies explore its targeted use in non-specific CLBP from the therapists' perspective [12]. This research aims to contribute to evidence-based practice by assessing how Pilates may reduce pain, improve flexibility, enhance core strength and mobility, and correct postural issues [8].

## Methodology

### Study Design:

Based on the experiences and observations of physical therapists, the study was designed as a survey to assess the perceived effectiveness of Pilates-based exercises in the management of non-specific chronic low back pain (CLBP).

### Study Population And Conditions:

Licensed physical therapists with experience treating CLBP with Pilates exercises made up the study population. These physical therapists worked in a variety of clinical settings when the study was carried out.

### Sampling Strategy:

To choose participants with prior experience performing Pilates-based exercises for CLBP, a purposive sampling strategy was used.

**Sample Size:**
A total of 184 physical therapists were included in the survey's sample. Study Period: From Jan 1, 2024, to June 1, 2024, a period of six months, the study was carried out.

**Inclusion Criteria:**
Participants in this study included physical therapists holding a graduate degree who were actively working in clinical settings. Only those therapists who agreed to participate and were prescribing Pilates exercises for patients with chronic low back pain (CLBP) at least once a week were eligible.

**Exclusion Criteria:**
Physical therapists who were not currently practicing or who declined to participate in the study were excluded.

**Study Parameters:**
The study focused on key clinical outcomes such as increased core strength, improved flexibility and functional mobility, correction of postural deformities, and a perceived reduction in pain. Ethical considerations included obtaining informed consent and ensuring the confidentiality of participant responses.

**Statistical Analysis:**
The data was extracted and processed in Microsoft Excel, and statistical analysis was performed using SPSS-23 software. A paired t-test was conducted using the Partial Least Squares Structural Equation Model (PLS-SEM) to evaluate the significance of the relationship between the benefits of Pilates-based exercises and chronic lower back pain.

**Result**
The demographic parameters of the 184 participants who agreed to participate in the consent form and filled out the baseline proforma are mentioned in [Table 1]. Percentages were reported for age groups 21-60 among physio faculty, hospital physiotherapists, physiotherapy clinics, and known physiotherapists around us for the completion of our data collection.

**Table 1: Demographic representation of Age n=184**

| Age | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| 21 - <30 | 93 | 50.0 | 50.0 | 50.0 |
| 30 - <40 | 42 | 22.6 | 22.6 | 72.6 |
| 40 - <50 | 31 | 16.7 | 16.7 | 89.2 |
| 50 - 60 | 20 | 10.8 | 10.8 | 100.0 |
| Total | 184 | 100.0 | 100.0 | - |

Table 1 indicate that the majority of the sample age group is 21 - <30, with 50% of the respondents. The age group category of 30 - <40 is 22.6% of the sample. The majority of the sample is classified as "Less than 30," with 50% of the respondents falling into this category. The "More than 30" category represents 50% of the sample. The interpretation suggests that the majority of respondents' age range between 21 - <30 (50 %,) while the age range between 30 - <40 (22.6%) also has a significant representation. The age range 40 - <50 (16.7%) and 50-60 (10.8%) categories have smaller proportions in the sample. The cumulative percent for each

`category increases as you move down the table and reaches 100.0% at the total row, indicating that all cases are accounted for.

**Table 2: Demographic representation of Gender n=184**

| Gender | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| Male | 88 | 47.3 | 47.3 | 47.3 |
| Female | 98 | 52.7 | 52.7 | 100.0 |
| Total | 184 | 100.0 | 100.0 | |

Table 2 indicates that the higher respondents in the sample are female, with 52.7%. The male category represents 47.3% of the sample. The interpretation of gender suggests that the majority of the respondents for this study are female and slightly lesser respondents are male. The cumulative percent for each category increases as you move down the table and reaches 100.0% at the total row, indicating that all cases are accounted for.

**Table 3: Demographic representation of Years of Experience in Physiotherapy of n=184**

| Year Of Experience | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| 0-5 years | 102 | 54.8 | 54.8 | 54.8 |
| 6-10 years | 25 | 13.4 | 13.4 | 68.3 |
| 11-15 years | 19 | 10.2 | 10.2 | 78.5 |
| 16-20 years | 14 | 7.5 | 7.5 | 86.0 |
| 21 years and above | 26 | 14.0 | 14.0 | 100.0 |
| Total | 184 | 100.0 | 100.0 | |

Table 3 and Figure 3 indicate that the majority of the sample of years of experience in physiotherapy is 0-5 years, with 54.8% of the respondents. The category of 6-10 years is 13.4% of the sample. The category of 11-15 years is 10.2% of the respondents. The category of 16-20 years of experience is 7.5% and the experience of 21 years and above is 14.0%.The interpretation suggests that the majority of respondents have 0-5 years of experience (50 %,) while respondents that have 21 years and above of experience (14%) also have a significant representation. The respondents that have 6-10 years of experience (13.4%), respondents that have 11-15 years of experience (10.2%), and respondents that have 16-20 years of experience (7.5%) categories have smaller proportions in the sample. The cumulative percent for each category increases as you move down the table and reaches 100.0% at the total row, indicating that all cases are accounted for.

**Correlation Statistics:**

**Table 4: Statistical analysis of correlation using Pearson Correlation**

**Correlation**

| | | Benefits observed in patients with chronic low back pain engage in Pilates-based exercises? | Improved mobility | Enhanced core strength | Better posture | Pain management |
|---|---|---|---|---|---|---|
| Benefits observed in patients with chronic low back pain engage in Pilates-based exercises | Pearson Correlation | | .756** | .285** | .045 | .045 |
| | Sig (1-tailed) | | .000 | .000 | .271 | .271 |
| 2) Pilates-based Exercises Relation to Improved mobility | Pearson Correlation | .756** | | .511** | .147* | .147* |
| | Sig (1-tailed) | .000 | | .000 | .022 | .022 |
| 3) Pilates-based Exercises Relation to Enhanced core strength | Pearson Correlation | .732** | .774** | | .214** | .214** |
| | Sig (1-tailed) | .000 | .000 | | .002 | .002 |
| 4) Pilates-based Exercises Relation to Better posture | Pearson Correlation | .285** | .511** | | .290** | .290** |
| | Sig (1-tailed) | .000 | .000 | | .000 | .000 |
| 4) Pilates-based Exercises Relation to Pain management | Pearson Correlation | .045 | .147* | .290** | .290** | |
| | Sig (1-tailed) | .271 | .022 | .000 | .000 | |

**Correlation is significant at the 0.01 level (1-tailed).**

**Correlation is significant at the 0.05 level (1-tailed).**

To investigate the relationship of benefits observed in patients with chronic low back pain engage in Pilates-based exercises with Improved Mobility (IM), Enhanced Core Strength (ECS), Better Posture (BP) and Pain Management (PM) Pearson correlation analysis was used. Since, the significance of correlation coefficient must be (=> 0.01 or => 0.05).

**Discussion**

Our findings show that Pilates based exercise has a significant effect on patients with chronic low back pain (CLBP). These exercises in particular can improve mobility, strengthen your core, tone your body, and manage pain effectively. The results are consistent with previous studies, thus supporting the suitability and importance of Pilates in the treatment of chronic low back pain (CLBP). Franks,J. (2023) [15] conducted a systematic review to evaluate the effect of Pilates on muscle activation in patients with low back pain. Their research concluded that Pilates is as effective as other types of exercise at strengthening muscle tone and reducing discomfort. Our findings show a positive relationship between practicing Pilates and improving core strength. The correlation coefficient ($r = 0.732$) indicates a high correlation, while the p value ($p < 0.01$) indicates that the relationship is significant. This shows that Pilates is not only good for

the whole body, it helps focus and strengthen muscles that are especially important in sustaining chronic lower back pain (CLBP). Wong, C. M., Rugg, B., &Geere, J.(2023) [16] investigated the effectiveness of Pilates exercises in treating chronic back pain compared to other exercises. Their studies showed that Pilates was more effective than exercise in treating patients with low back pain, but the data was less reliable. Our findings are consistent with previous studies showing a positive relationship between Pilates and pain management (correlation coefficient = 0.290, $p < 0.01$). This suggests that Pilates may be an effective way to reduce pain in patients with chronic low back pain (CLBP). Although, the finding is less clear, but it is important to analyze our results further. This contributes to the rationale for using Pilates as an effective technique in treating patients with chronic low back pain (CLBP). In 2022 meta-analysis and a systematic review of 19 randomized controlled studies conducted by Yu, Z.; Yin, Y.; Wang, J.;Zhang, X.; Cai, H.Peng[17], found that Pilates had a substantial effect in reducing pain and enhancing functional capacity. However, its influence on quality of life was found to be limited. The findings of our research support the enhancement of functional skills, such as better mobility (correlation coefficient $r = 0.756$, $p < 0.01$), and core strength. However, our study did not directly investigate the impact on quality of life. The significant improvements in mobility and core strength shown in our research suggest that Pilates has the potential to increase physical functioning, which is often a prelude to an improved overall quality of life. Nevertheless, the study indicates that while there are noticeable physical benefits, they may not always result in significant increases in reported quality of life. This underscores the need for more research in this area. Also In 2020, a review conducted by CíntiaDomingues de Freitas, Deborah Araujo Costa, ViniciusTassoniCivile, [18] and Nelson Carvas they found that Pilates was better than minimal or no intervention at reducing kinesiophobia. Although our study did not clearly demonstrate kinesiophobia, significant improvement in movement ($r = 0.756$, $p < 0.01$) and posture ($r = 0.290$, $p < 0.01$) showed that the fear of movement would decrease due to the improvement of physical appearance. is frequently affected. With increased athletic ability. This is consistent with the results of Freitas emphasize the mental benefits Pilates can bring due to its physical strength. Our study's methodological rigor, with a large sample size of 184 participants and the use of various statistical tools such as Pearson correlation and PLS-SEM, is comparable to that of Hui-Ting Lin, (2016) [19] and Posadzki, Paul et al,(2010) [20], who employed high-quality randomized controlled trials and systematic reviews. However, our larger sample size provides more robust statistical power and potentially more generalizable findings, addressing one of the limitations highlighted by Posadzki et al. regarding small sample sizes and heterogeneous population.

**Conclusion:**

The results of our research indicate that Pilates is a successful intervention for enhancing mobility, core strength, posture, and pain management in persons suffering from chronic low back pain. These results align with previous research, strengthening the evidence for the effectiveness of Pilates in managing chronic low back pain. The significant correlations discovered between Pilates exercises and improvements in key physical outcomes emphasize the potential of this exercise modality to provide substantial alleviation and improved functional capacities in people with chronic low back pain (CLBP). However, more investigation is required to examine the enduring advantages and tackle the observed constraints.

**Future Recommendation:**

For communication professionals and practitioners in the field of physiotherapy, the implications of these findings are significant. Pilates can be confidently recommended as an effective intervention for CLBP, with proven benefits in enhancing core strength, mobility, posture, and pain management. These findings can inform clinical practices and patient education, emphasizing the multifaceted benefits of incorporating Pilates into rehabilitation programs. Practitioners can use this evidence to advocate for the inclusion of Pilates in treatment plans, helping patients understand the potential improvements in physical function and pain relief that can be achieved through consistent practice.

**References**


1. Damian Hoy, Christopher Bain, Gail Williams, Lyn March, Peter Brooks, Fiona Blyth, Anthony Woolf, Theo Vos, Rachelle Buchbinder (2012). A systematic review of the global prevalence of low back pain.
2. MC Valenza, J Rodríguez-Torres, and Y Castellote-Caballero (2016). Results of a Pilates exercise program in patients with chronic non-specific low back pain: a randomized controlled trial.
3. Lancet et al (2018). Prevention and treatment of low back pain: evidence, challenges, and promising directions
4. Jamil Natour, Luciana de Araujo Cazotti, and Anamaria Jones. Pilates improves pain, function and quality of life in patients with chronic low back pain: a randomized controlled trial.
5. Marshall, Paul W. M. PhD; Kennedy, Suzanne (2013). Pilates Exercise or Stationary Cycling for Chronic Nonspecific Low Back Pain. A Randomized Controlled Trial With 6-Month Follow-up.
6. Chenot, JF; Greitemann, B; Kladny, B; Petzke, F; Pfingsten, M; Schorr, S G(2017).Clinical Practice Guideline Non-Specific Low Back Pain
7. Edwin ChoonWyn Lim, Ruby Li Choo Poh, MClinPhty(Manip), Ai Ying Low, PT (2011). Journal of Orthopaedic& Sports Physical Therapy.
8. Patricia L Loney, Paul W Stratford (1999). The Prevalence of Low Back Pain in Adults: A Methodological Review of the Literature.
9. Cherie Wells, Gregory S. Kolt, Andrea Bialocerkowski (2012). Defining Pilates exercise: A systematic review. School of Science and Health, University of Western Sydney.
10. Arián R. Aladro-Gonzalvo Lic, Gerardo A. Araya-Vargas M.Sc, Míriam Machado-Díaz MD, Walter Salazar-Rojas Ph.D (2012). Pilates-based exercise for persistent, non-specific low back pain and associated functional disability: A meta-analysis with meta-regression.
11. S Wells at al (2014). The Effectiveness of Pilates Exercise in People with Chronic Low Back Pain: A Systematic Review.
12. Antonino Patti,Jane S. Thornton,ValerioGiustin (2023). Effectiveness of Pilates exercise on low back pain: a systematic review with meta-analysis.
13. Benjamin E Smith (2014). An update of stabilisation exercises for low back pain: a systematic review with meta-analysis.
14. RochendaRydeard, Andrew Leger, Drew Smith (2006). Journal of Orthopaedic& Sports Physical Therapy, Pilates-Based Therapeutic Exercise: Effect on Subjects With Nonspecific Chronic Low Back Pain and Functional Disability: A Randomized Controlled Trial.

15. Franks,J.;Thwaites,C.;Morris,M.E.Pilates to Improve Core Muscle Activation in Chronic Low Back Pain:A Systematic Review.Health care.
16. Wong, C. M., Rugg, B., &Geere, J. (2023). The effects of Pilates exercise in comparison to other forms of exercise on pain and disability in individuals with chronic non-specific low back pain: A systematic review with meta-analysis. Musculoskeletal Care.
17. Yu, Z.; Yin, Y.; Wang, J.;Zhang, X.; Cai, H.; Peng, F. Efficacy of Pilates on Pain, Functional Disorders and Quality of Life in Patients with Chronic Low Back Pain: A Systematic Review and Meta-Analysis. Int. J.Environ. Res.
18. Domingues de Freitas, Cíntia et al. "Effects of the pilates method on kinesiophobia associated with chronic non-specific low back pain: Systematic review and meta-analysis." Journal of bodywork and movement therapies.
19. Lin, H. T., Hung, W. C., Hung, J. L., Wu, P. S., Liaw, L. J., & Chang, J. H. (2016). Effects of pilates on patients with chronic non-specific low back pain: a systematic review. Journal of physical therapy science.
20. Posadzki, Paul et al. "Pilates for low back pain: a systematic review." Complementary therapies in clinical practice.