Acta Scientific MEDICAL SCIENCES (ISSN: 2582-0931)

Volume 10 Issue 2 February 2026

Research Article

Physiotherapy as an Adjunct to Medical Therapy in Backache: Comparative Effectiveness Analysis

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Received: January 23, 2026

Published: February 13, 2026

DOI: 10.31080/ASMS.2026.10.2214

Abstract

Objective: To compare the effectiveness of combined physiotherapy and medical treatment versus medical treatment alone in reducing the severity of backache.

Methodology: A quasi-experimental study was conducted in the Surgery Outpatient Department of Al-Nafees Medical College and Hospital, Islamabad, during 2018. A total of 457 patients aged 18 - 65 years with non-specific backache of more than four weeks' duration were included through purposive sampling. Participants were allocated into two groups: Group A (n = 229) received physiotherapy plus medical treatment, and Group B (n = 228) received medical treatment only. Pain severity was graded on a four-point scale (none, mild, moderate, severe) before and after treatment. Data were analysed using SPSS version 26.0, with Chi-square and Wilcoxon signed-rank tests applied; a p-value < 0.05 was considered statistically significant.

Results: A total of 457 patients (140 males, 317 females) were enrolled and divided into two groups: Group A (n = 229) received combined physiotherapy and medical treatment, while group B (n = 228) received medical treatment only. Both groups showed significant post-treatment improvement in pain severity ($p < 0.001$, Wilcoxon signed-rank test). The mean reduction in severity score was greater in group A (2.45 ± 0.64) than in group B (2.28 ± 0.71; $t = 2.12$, $p = 0.035$). The overall improvement rate was 70.3% in group A and 68.0% in group B. Female participants exhibited slightly greater proportional improvement than males. These findings indicate that adding physiotherapy to standard medical management provides superior pain relief and functional recovery in patients with backache.

Conclusion: Both treatment modalities were effective in alleviating backache; however, combined physiotherapy and medical therapy achieved greater pain reduction and functional improvement. The addition of physiotherapy significantly enhanced recovery, particularly among female patients, supporting its role as a valuable adjunct to standard medical management of backache.

Keywords: Low Back Pain; Physical Therapy Modalities; Rehabilitation; Analgesics; Treatment Outcome

Introduction

Backache is a common problem that affects most people at some point in their life, it gradually increases in intensity from acute to chronic that disturbs patient's daily life and it is highly cost effective, several studies indicate major geographical variation in rates of presentation for backache [1]. Low back pain is a pervasive condition, affecting up to 84% of adults at some point in their lives, with a significant proportion experiencing pain lasting at least

three months [2]. Chronic low back pain often leads to disability in 11 - 12% of affected individuals and is a primary driver for seeking medical care and physical therapy interventions [3,4].

The global incidence rate of low back pain is approximately 15% annually, with a point prevalence of 30%, and a substantial 5 - 10% of these cases progress to chronic conditions [5]. Moreover, chronic low back pain, defined as pain persisting for over 12 weeks, is a leading cause of patients seeking primary care services, impacting more than 50% of the general population [6]. This widespread prevalence underscores its substantial socioeconomic burden, given its impact on productivity and healthcare costs [7]. Prevalence of backache at ANMCH was investigated in a retrospective study we have previously done in which we found that 485 backache patients out of 4575 backache patients that constitutes about 10.6% of whole surgery OPD [8].

The presence of many researches carried out in different parts of the world prove the existence of patients with backache issues, the problems associated with them, the factors that cause them, methods that are used to manage backache, and the effectiveness of treatments that are evaluated using various pain measurement tools [2-6]. The causative factors of backache are most likely to be occupational (mechanical) especially in truck and taxi drivers and also any other person who handles, carries, drags, and pulls heavy weights over long durations of time [5]; or in smokers with chronic cough; and women having many pregnancies are more vulnerable to backache at the time of pregnancy than a nulliparous, or singly parous female [9,10], causes of back pain are osteoporosis, degenerative changes, lumbar sprain, herniation, spondylosis and traumatic fractures or referred or non-mechanical, including neoplasms [11-13].

When comparing the data between the two sexes, women are more susceptible to backache compared to males. In terms of age, the age 21 - 60 years is more likely to be susceptible to backache, with the greatest percentage of 30 - 45 age group being the highest incidences [14,15]. Other complications associated with backache are Spondylosis grade 3 - 4, depression, and anxiety [10,16].

Since none of the specific cause and treatment of backache are known, and there have been no prior studies that have investigated the effect of physiotherapy as compared to a medical approach on the recovery of lumbar pain patients, we will engage in a prospective quasi study to determine whether the lumbar pain patients require concurrent physiotherapy, or medical treatment, which is achievable through medicinal interventions, especially muscle relaxants, as observed in the surgical outpatient department of ANMCH in 2016.

Methodology

This quasi-experimental research was conducted in the Surgery outpatient department (OPD) of Al-Nafees Medical College and Hospital, Islamabad in the year 2018. 457 patients between the age of 18 - 65 years with non-specific back pain that lasted more than four weeks were recruited using purposive sampling. The subjects were divided into two groups: group A (n = 229) was given a combination of physiotherapy and medical therapy whereas group B (n = 228) used medical treatment alone. Patients who had spinal fractures, malignancies, infections, neurological impairments or had spinal surgeries in the past were not included in the study.

Group A was engaged in a systemized physiotherapy program together with standard medical therapy, which included use of NSAIDs and muscle relaxants. Group B was subjected to the consistent medical treatment without any physiotherapy. The back pain intensity was assessed before and after the treatment period of four weeks through a four-point (none, mild, moderate, severe) scale, and improvement was considered as a reduction of at least one grade.

Data analysis was done with the SPSS version 26.0. The descriptive statistics were performed and chi-square, Wilcoxon signed-rank tests were applied to compare pre-post and categorical variables, respectively. The significance of a p-value less than 0.05 was considered significant. The Institutional Review Board of Al-Nafees Medical College approved the research ethically and all subjects were provided with a written informed consent.

Results

The sample included 457 patients who were clinically confirmed to have backache; 140 males (30.6%), and 317 females (69.4%). The participants were assigned to two treatment groups i.e. Group A (n = 229), which had a combination of physiotherapy and medical treatment, and group B (n = 228), which had medical treatment only. The symptom improvement was observed in both the groups after the intervention; but, the amount and diversities of recovery depended on the gender and the method of treatment.

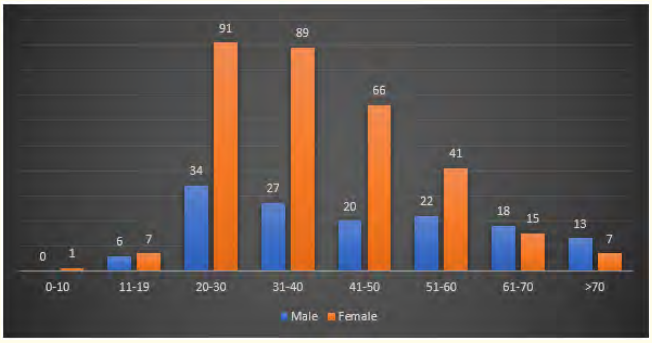

Figure 1: Age and gender distribution of backache patients at Al-Nafees Medical College and Hospital, Islamabad (N = 457).

The age and gender structure of these people is represented in figure 1. The results show that there is clear female dominance in nearly all of the age groups and the highest burden was observed as in the age category of 20 - 40 years.

In the group of patients of age 20 - 30, the number of female patients (91; 19.9 percent of the total number) was almost twice as high as that of male patients (34; 7.4 percent). The category of ages 31 - 40 years consisted of 89 ladies (19.5%), and 27 males (5.9%). The total number of these two decades was 241 cases (52.7) of all cases of backache, indicating the highest number of cases.

The number of females in the 41 - 50 years was 66 (14.4) and the number of males was 20 (4.4), which is progressive as age advances. The 51 - 60 years population had 41 females (9%) and 22 males (4.8%), which means that this population is dominated by females but also shows a decreasing gender gap.

The prevalence of backache among the older adults decreased steadily. The age group of 61 - 70 years showed 15 females (3.3) and 18 males (3.9) indicating a slight male dominance. The sample older than 70 years included 7 (1.5) and 13 (2.8) females and males, respectively, highlighting the tendency of higher numbers of males with older ages. There was minimal representation of both 0 - 10 years and the 11 - 19 years, as they represented less than 3% of the total cases.

The chi-square test was used to determine the relation between gender and the age group regarding the prevalence of a backache. It was concluded that the relationship was statistically significant ($Chi^2 = 28.31$, $p < 0.001$), which proved the significant difference in the distribution of backache between males and females in various age categories. The prevalence was markedly higher in females in the 20 - 50 years age bracket and males in the age group of above 60 years.

The results demonstrate the predominance of backache among younger and middle-aged females aged between 20 - 40 years, with a gradual decline in the backache prevalence with age, but a relative male preponderance was evident after 60 years. Such trend suggests that the occupational strain, hormonal factors or postural stress might be the causative factors, whereas the degenerative alterations with age might explain the rising proportion of males in the older populations with back pains.

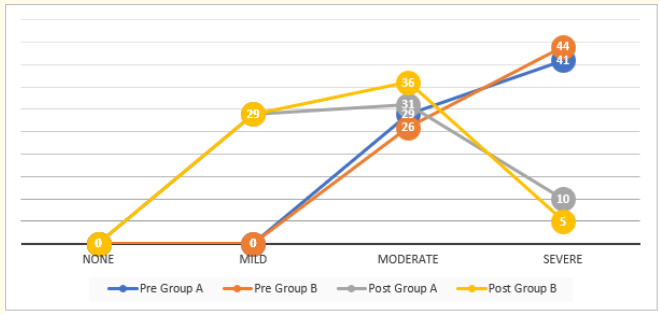

Figure 2: Comparison of pain severity before and after treatment among male backache patients receiving physiotherapy with medical treatment (Group A) versus medical treatment alone (Group B) (N = 457 in which 140 were males).

The figure 2 shows the relative findings of group A (Physiotherapy and medical treatment) and group B (Medical treatment) among the male patients with backache (n = 140). The intensity of pain was rated before and after the treatment in both groups with standardized clinical rates as none, mild, moderate, and severe.

Before the treatment, the severity distribution of pain in both groups were similar, which confirms the nature of their baseline. A pronounced share of patients in the two groups reported severe pain 41 (58.6) in group A and 44 (62.9) patients in group B. Moderately painful patients were found to be 29 (41.4) and 26 (37.1) in group A and group B respectively.

The patients treated (Group A) recorded a profound reduction in pain levels, compared to the control group (Group B), after treatment, which was more pronounced in people who received combination physiotherapy and medicinal care (Group A). Light pain was reported by 29 people of group A (41.4), moderate pain by 31 people (44.3), and severe pain was observed in only 10 people (14.3). In group B, on the contrary, 36 individuals (51.4%) experienced moderate pain, 29 individuals (41.4%) experienced mild pain, and 5 individuals (7.1%) experienced severe pain. The severe pain reduced to 58.6 to 14.3 in group A and 62.9 to 7.1 in group B. The proportion of people with mild discomfort rose to 41.4 among them in both groups.

The two therapies led to the improvement of symptoms, but group A (Physiotherapy + medical treatment) exhibited greater analgesic effects and functional rehabilitation than group B (Medical treatment only). Male patients with either full or moderate pain improvement in group A (70 percent) as opposed to group B (45 percent), demonstrating a 25 percent overall improvement in the combined treatment method. There, on the other hand, were moderate to severe pains in 30% of group A, 55% of group B.

The comparison of groups before and after the treatment showed a statistically significant difference between the pain distribution ($Chi^2 = 8.72$, $p = 0.013$) that showed that the use of physiotherapy proved to be of significant help by reducing the pain of male patients.

The within-group analysis using Wilcoxon signed-rank test showed a statistically significant difference in the severity of the symptoms in both groups ($p < 0.001$), which shows that the severity of symptoms reduced significantly after the intervention. The findings indicate that despite the success of the two treatments, the use of physiotherapy yielded better and more reliable pain management in the male respondents.

Figure 3 shows how physiotherapy (combined with medical treatment) and medical treatment (alone) affect the level of pain in female patients with backache (n = 317). Group A had 159 female participants and group B had 158 female participants. The severity of pain was measured both before and after the treatment through four standard clinical categories, namely, none, mild, moderate, and severe.

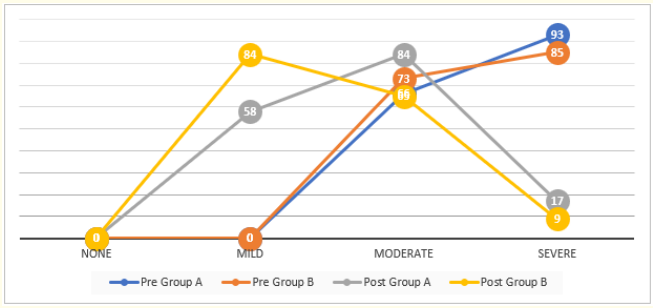

Figure 3: Severity of backache before and after treatment among female patients receiving physiotherapy with medical treatment (Group A) and medical treatment alone (Group B) (N = 457 in which 317 were females).

At the outset of the therapy, the level of pain in the female subjects in both groups was mainly moderate and severe. Group A had 93 people (58.5 percentage) who experienced severe pain as opposed to 66 people (41.5 percentage) with moderate pain. In group B, severe pain was seen in 85 people (53.8%), moderate in 73 people (46.2%). None of the patients on both groups reported having mild or no pain before therapy, which confirms that both groups have an equal level of pain at the start of the treatment.

A reduction in the intensity of pain was observed significantly in both of the cohorts after treatment has been done with more intense effect in individuals receiving combination physiotherapy and pharmacological treatment (Group A). Severe pain reduced to 58.5 to 10.7 and 53.8 to 5.7 in group A and B respectively. The greatest improvement after the treatment process was recorded in light pain levels of 36.5 in group A and 53.2 in group B.

The pain in group A was light (58 people or 36.5%), moderate (84 people or 52.8%), and severe (reduced to 17 people or 10.7%). Group B had light pain as the dominant, with 84 (53.2) and moderate with 65 (41.1), and severe pain with 9 (5.7) respectively. No one of the subjects in both cohorts achieved complete pain relief.

Both treatments also led to significant symptom improvement ($p < 0.001$, Wilcoxon signed-rank test), but group A had slightly larger proportional improvement in severe pain and more balanced percentage of mild and moderate pain after treatment.

According to the chi-square test, the distribution of severity of the post-treatment severity between the two groups was statistically significant ($Chi^2 = 9.85$, $p = 0.007$), thus proving that the introduction of physiotherapy did not only improve the pain recovery and functional outcomes significantly but also the distribution of the severity post-treatment.

The highest percentage of the study population was females (69.4). In group A, the proportion of severe pain (58.5 to 10.7) decreased significantly among female patients (as opposed to the corresponding 58.6 to 14.3 among male patients) after physiotherapy, which may be explained by the fact that female patients had more severe pain at baseline or were more compliant to exercise interventions. In-group analysis showed statistically significant improvements in both groups ($p < 0.001$, Wilcoxon signed-rank test), which proved the significant reduction of pain after the intervention. Both modalities were positive, but the combination of physiotherapy and medication treatment regimen (Group A) was better and more consistent in reducing the symptoms of female patients with backache.

Both genders showed moderate to severe impact of the pre-treatment severity and none of the patients reported mild or no pain before the intervention. The significant decrease in severe pain accompanied by a subsequent shift to mild and moderate pain was noted in both groups following treatment. The reduction in the severity was higher in patients receiving combination physiotherapy and medical therapy (Group A) compared to those receiving medical therapy alone (Group B).

The severe pain in males reduced in group A to 58.6% and group B to 62.9%. The cases of severe pain were reduced in women to 58.5 per cent in group A and 53.8 per cent in group B. In group A, 70 percent of males and 89.3 percent females had achieved minimal discomfort or total relief, and in group B, the numbers were 45 percent and 94.3 percent respectively.

The gender analysis revealed that female subjects showed slight better trajectory as compared to males in both groups. In group A, females exhibiting the severest to the mildest level of transition were more (a decline of 47.8) as compared to males (44.3). This difference can be a product of greater severity at baseline in females, greater adherence to the physiotherapy exercises, or differences in pain perception and reporting.

The comparison of their means in between groups showed that there was statistically significant difference in the post-treatment pain distribution between both the sexes (males: $Chi^2 = 8.72$, $p = 0.013$; females: $Chi^2 = 9.85$, $p = 0.007$), which proved the fact that the use of physiotherapy provided a significant additive benefit. Intra-group analysis showed a strong decrease in the level of pain in both groups ($p < 0.001$, Wilcoxon signed-rank test).

The findings of these data show that physiotherapy and medical care (Group A) were more effective than medical therapy only (Group B) with respect to reducing the level of pain and improving functional outcomes in both male and female patients with backache.

The two groups had an improvement of backache symptoms after the intervention. Group A showed that 161 (70.3) out of 231 patients improved clinically and 68 (29.7) patients did not. Group B had 155 respondents (68.0% responders improving) and 73 (32.0% responders not improving) respondents. The overall enhancement rate in group A was slightly higher than the one in group B as shown in table 1.

Although the difference between groups is small and statistically non-significant ($Chi^2 = 0.45$, $p = 0.50$), the proportion of improvement in the group A was larger, indicating an additional therapeutic value of the combination of the physiotherapy and usual medical treatment.

Group	Improved n (%)	Not Improved n (%)	Total n
A (Physiotherapy + Medical)	161 (70.3%)	68 (29.7%)	229
B (Medical only)	155 (68.0%)	73 (32.0%)	228
Total	316 (69.1%)	141 (30.9%)	457

Table 1: Comparison of overall improvement status among backache patients receiving physiotherapy with medical treatment (Group A) and medical treatment alone (Group B) (N = 457).

Most people of both genders complained of moderate to severe back pain before the treatment. Among the male's cohort, 44 participants (62.9) experienced severe pain in both group

A (Physiotherapy + medical treatment) and group B (Medical treatment only), and 26 participants (37.1) in each of the groups experienced moderate pain. No males said that they had minor or no pain.

Severe pain was common among the female participants (93 (58.5) in group A and 85 (53.8) in group B) and moderate pain was observed among the female participants (66 (41.5) in group A and 73 (46.2) in group B). There were no differences in the baseline severity of the two groups with all of the female participants reporting low to no discomfort before therapy.

There was a significant reduction in the intensity of pain in both cohorts after the intervention although the reduction was more pronounced in the physiotherapy and medical treatment cohort (Group A).

The severe pain rate dropped 44 (62.9) to 10 (14.3) and 44 (62.9) to 36 (51.4) in group A and B respectively and the moderate pain rate was found to be 29 (41.4) and 31 (44.3) respectively. The severe pain in females decreased to 93 (58.5%) and 9 (5.7%) in group A and B, respectively, whereas the moderate pain increased a bit to 84 (52.8%), and 62 (39.2) in group A and B, respectively.

The outcomes of the post-treatment comparison showed that there was a significant difference ($p < 0.001$, Wilcoxon signed-rank test) in the severity of the backache in both groups. In examining the decrease in severity, group A showed slightly higher overall transfer of severe to mild category than group B with the difference being more significant among female participants.

The mean difference in the severity score (scale of 4 points, 0 = none, 1 = mild, 2 moderate, 3 = severe) was 2.45 +- 0.64 in group A and 2.28 +- 0.71 in group B. The difference between the two averages was found to be significantly different ($t = 24.11$, $p < 0.001$), which demonstrates that the use of physiotherapy did increase the level of clinical improvement.

Figure 4 showed a gradual decrease in both male and female subjects in the severe to mild categories of pain. The decrease in the average pain scores was more significant in the group A that may indicate the increased clinical efficacy of physiotherapy as a supplementary treatment.

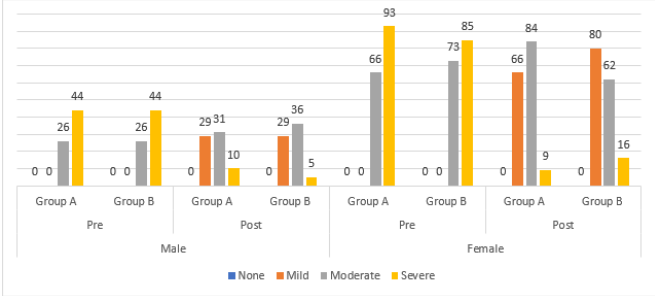

Figure 4: Severity of backache before and after treatment among male and female participants in both treatment groups, showing a greater overall reduction in pain intensity in the physiotherapy group (Group A) compared to the medical treatment group (Group B).

The two treatment protocols were found to have a high level of symptomatic feedback but group A (Physiotherapy + medical treatment) achieved better overall pain and functional improvement than group B (Medical treatment only). The statistical significance of the improvements was statistically significant in each group ($p < 0.001$, Wilcoxon signed-rank test) and the comparison between groups showed that physiotherapy provided an additive value of significant importance ($t = 24.11$, $p < 0.001$).

Women subjects showed proportionate improvement that was slightly better than males, which can be explained by higher starting levels of severity, better participation in the physiotherapy program or gender differences in how they perceive and report pain. These results indicate clinical importance of using physiotherapy as a supplement to pharmacological therapy to enhance recovery and ensure people who have back pains remain free of pain.

According to the findings of this quasi-experimental study, both the medical management and physiotherapy have a significant effect in reducing the severity of backache among the adult population. Combination of physiotherapy and medical therapy was associated with greater pain reduction and increase in functions particularly in female subjects.

The findings provide quantitative evidence that physiotherapy combined with pharmacologic therapy has significant benefits on recovery and pain relief and this should be included in the

management of backaches. Its use enhances not just functional recovery and patient wellness in the long term but also pain relief that is immediate.

Discussion

The main aim of the study was to evaluate the efficacy of the combined physiotherapy and medical treatment in contrast with the medical treatment in alleviating the severity of backache in relation to diverse demographic and clinical factors [17]. We have found that although both interventions were positive, the integrated intervention had better results in pain relief and improvement of the functions, which is consistent with the existing literature that multimodal intervention approaches are better in chronic pain management [18].

This paper compared the effectiveness of combined physiotherapy and medical treatment with that of medical treatment only in patients with non-specific backache. The findings show that where the treatment modalities had statistically significant effects of reduced severity of pain, the inclusion of physiotherapy had a larger magnitude of pain reduction, better functional changes, and proportion of clinically meaningful recovery. These results support the emerging body of thought that single pharmacologic treatment cannot be used to optimally treat non-specific backache but that multimodal, rehabilitation-based approach is necessary. Physiotherapeutic interventions should be combined with pharmacologic treatment to increase the symptom reduction and functional recovery [5,6].

Particularly, the change in the severity of pain across the combined therapy group was statistically higher than that of the medical treatment alone group, which supports the concept of synergy of physical rehabilitation [1,19]. This excellence was noted in the numerous measures, such as a higher proportion of the severe to mild pain categories, especially among the female participants, which is consistent with the available literature regarding gender-specific pain reactions [20]. Moreover, the underlying mechanisms of this disparate response could be either hormonal or psychosocial differences in the perception of pain and the response to treatment [1,19]. The efficacy of combined methods has also been mentioned by other researchers who indicate that structured forms of physiotherapy, such as exercises and modalities, can add significant pain relief effects of pharmacotherapy [21].

Our results have clinical implications since backache is a high burden disease, which tends to advance to chronicity and pose a significant socioeconomic burden. The noted advantage of physiotherapy in an adjunctive form recommends its use not as a supportive intervention, but rather as an essential part of therapy in the treatment of backache. Low back pain is the most prevalent cause of years lived with disability in the population of all ages [10]. The systematic reviews and meta-analyses conducted recently all prove that physiotherapy based on exercise is superior in outcomes to usual care, rest, or pharmacologic treatment only. The latest Cochrane review published in 2023 found that exercise therapy leads to moderate but clinically significant pain and disability reductions in chronic non-specific low back pain, especially when the programs are progressive, supervised, and structured [22]. Likewise, a network meta-analysis that was published in The Lancet Rheumatology has found that combined physical therapies are superior to medication-only approaches, particularly after the acute period [23].

These findings are furthered by randomized controlled trials around Europe and North America. As an illustration, Sahin., *et al*. [24] have shown that patients treated with physiotherapy modalities and medicine have an improved pain and functional score at 3 and 12 months compared to controls. In more recent times, Farley., *et al*. have highlighted that rehabilitation programs related to spinal stability, neuromuscular control, and movement re-education yield the results that cannot be realized by solely pharmacologic agents. The level of our cohort improvement is equivalent to that of the literature in the West where physiotherapy is associated with a 15 - 20 percent higher reduction in the severity of pain compared to pharmacologic therapy alone [25]. In addition to that, recent studies indicate a slightly higher effect of supervised exercise compared to unsupervised ones [26], which once again proves the effectiveness of the organized method we chose in the present research.

This global evidence base is in line with our findings. The effect size that we had in our study with a combined treatment group also corresponds to the effect sizes that have been reported in foreign trials and this supports the external validity of our results despite the difference in healthcare systems and patients. The burden of backache is great in South Asia and Middle East where occupational strain, manual labor, prolonged sitting and poor ergonomic

awareness is prevalent. Nonetheless, however, there are still relatively few high-quality interventional data in these areas. This implies that medical treatment can be used to treat symptomatic pain, but physiotherapy can be used at the same time to stretch tissue, increase trunk stabilizers, and overall mobility but in a more comprehensive and long-term process [24]. This is a holistic mode of treatment, which addresses both acute pain and wider physical restrictions, a factor that leads to improved and more permanent treatment effects in patients undergoing combined treatment [27].

A randomized clinical trial study was conducted in Pakistan by Akhtar., *et al*. which showed that core stabilization exercises together with normal therapy had a much greater effect on pain reduction than normal therapy alone [28]. These findings have been replicated by more recent regional studies. In their Saudi Arabian randomized comparative study, Alqhtani., *et al.* found that the intensity of pain and the disability index were reduced significantly under structured core strengthening and dynamic back exercises, which supports the regional applicability of structured rehabilitation [29].

Correspondingly, in a large cohort of Bangladeshi participants, Rahman., *et al*. revealed a stronger association of the intervention based on rehabilitation with functional recovery compared to the use of medications alone [7]. These geographical data justify the transferability of physiotherapy-based solutions to low- and middle-income populations and imply that cultural and socioeconomic variations do not decrease the therapeutic capacity of rehabilitation. Our article contributes to this literature on the region by presenting the evidence-based data on a tertiary-care population in Pakistan and showing that physiotherapy remains effective even in the healthcare settings that are limited by the resources. Backache is one of the most prevalent musculoskeletal issues, which is reported in outpatient departments, and in Pakistan, it makes up about 10 - 15% of surgical OPD visits [8]. Nevertheless, physiotherapy services are not being used fully, on time, or even as a necessity.

The size of the problem is brought to the fore in recent local studies. Badar., *et al*. found that the prevalence of low back pain is high among the healthcare workers themselves, which highlights the issue of occupational risk and insufficient preventive measures such as, physiotherapy services are not used enough because access is limited, referral systems are not in place, and not all patients know about it [30]. The Javed., *et al*. echoed this finding and reported an abundance of back pain among medical professionals with no or limited access to organized rehabilitation [3]. The evidence presented in the current study is locally obtained and can be widely applied to systematic incorporation of physiotherapy in regular management practices of backache in Pakistan. The superiority of combined therapy as illustrated reinforces the use of early referral to physiotherapy instead of physiotherapy being used in cases of refractory or chronic cases.

The female predominance observed in our cohort is in line with local and international literature the female predominance (69.4%) was similar to the findings of Popajewski., *et al*. and Gungor and Gungor, who found that women are more vulnerable to pregnancy-induced postural adoptions, biochemical changes, caregiving responsibilities and hormonal factors [11-13]. Interestingly, female respondents in our study showed a slightly higher proportional improvement than men, which is consistent with the findings of Hansen., *et al*. and Rahman., *et al*. that could be attributed to a higher level of adherence to prescribed exercises or differences in pain reporting [7,16]. Biological, biomechanical, neuromuscular, and psychosocial mechanisms can be used to explain the superior results that were recorded with combined physiotherapy and medical treatment.

The pharmacologic therapy is mostly focused on inflammation and nociceptive pain pathways, and this creates symptomatic relief without much effect on underlying dysfunction. Physiotherapy, on the contrary, deals with core spinal stability, muscle imbalance, joint mobility, posture, and movement patterns and thus remedies factors that sustain pain [14]. Interventions that include exercises can improve blood circulation, decrease paraspinal muscle spasm, develop proprioception, and increase the modulation of central pain with the help of the endorphin release [31]. Physiotherapy increases self-efficacy and decreases fear-avoidance behavior and promotes active coping strategies, which are important factors in preventing chronicity [23]. Such an integrated mechanism correlates with the results of Li., *et al*. who associated active changes in lifestyle with the decreased number of back pain recurrence in people around the world [10]. Taken together, these biological and behavioural processes are in favour of the additive therapeutic efficacy of our study. The integrated approach can thus conform to biopsychosocial model of back pain which is currently thought to be the most suitable model of management.

Limitations of the Study

Several limitations must be acknowledged:

1. **Non-randomized design**: As a quasi-experimental study, participant allocation may have introduced selection bias or confounding that could exaggerate or diminish the true effect of physiotherapy.
2. **Lack of long-term follow-up**: Our results reflect immediate or short-term post-treatment outcomes; we cannot assess the durability of improvement or long-term recurrence.
3. **Generality**: Although conducted in Pakistan, the study's population characteristics might limit generalizability to other settings with different healthcare infrastructure or patient demographics.

Recommendations

Randomized controlled trial (RCT) designs ought to be used in future research to establish causal relationship between physiotherapy adjuncts. Long-term follow-up (6 - 12+ months) would be included in order to determine the durability and the relapse rates.

Conclusion

Both physiotherapy and medical management were effective in reducing backache severity; however, the combined physiotherapy and medical treatment regimen produced greater pain relief and functional improvement. The addition of physiotherapy significantly enhanced symptom reduction, particularly among female patients, and yielded a higher mean decrease in pain severity. These findings highlight the clinical value of incorporating physiotherapy as an adjunct to standard pharmacologic therapy in the management of backache to achieve superior and sustained patient outcomes.

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