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Patient Satisfaction and Evidence-Based Improvements in Supervised Group Exercise for Axial Spondyloarthritis

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Abstract

Background: Axial spondyloarthritis (AS) causes reduced spinal mobility, functional limitations, and a decreased quality of life. The pupose of this study was to assess patient satisfaction and identify evidence-based improvements in supervised group exercise for axial spondyloarthritis. ***Aim of the study:*** The aim of this study was to evaluate patient satisfaction and identify evidence-based improvements in supervised group exercise for axial spondyloarthritis. ***Methods:*** This prospective, comparative study was conducted outdoors at the Rheumatology Department of Bangabandhu Sheikh Mujib Medical University (BSMMU) from January 2022 to June 2022, involving 40 patients with axial spondyloarthritis randomized into supervised or home-based exercise groups. The supervised group attended physiotherapist-led sessions at the Department of Physical Medicine and Rehabilitation, BSMMU, while the home-based group followed a guided regimen with weekly check-ins. Outcomes (BASDAI, ASQoL, BASFI, and adherence) were assessed at baseline and 12 weeks. Statistical analysis used t-tests, chi-square tests, and ANCOVA ($p < 0.05$, SPSS v25). ***Results:*** In this study of 40 patients with axial spondyloarthritis, the supervised exercise group showed significantly greater improvements in disease activity (-27.27%, $p < 0.0001$), quality of life (-48.80%, $p < 0.0001$), and functional outcomes (-52.38%, $p < 0.0001$) compared to the home-based group. Exercise adherence was higher in the supervised group (85% vs. 55%, $p = 0.03$). Satisfaction was also greater in the supervised group, with 95% reporting satisfaction versus 65% in the home-based group ($p = 0.011$). ***Conclusion:*** Supervised exercise significantly improves patient satisfaction, functional outcomes, and well-being in axial spondyloarthritis, highlighting the value of structured supervision.

Keywords: Axial Spondyloarthritis, Supervised Exercise, Disease Activity, Satisfaction, Functional Outcomes.

INTRODUCTION

Axial spondyloarthritis (AS) is a chronic inflammatory condition that primarily targets the axial skeleton, particularly the sacroiliac joints and spine.[1] As the disease progresses, it often leads to reduced spinal mobility and deformity, causing substantial functional limitations and a decreased quality of life for those affected.[2] Beyond physical impairments, AS also poses significant socio-economic challenges, leading to work disability and higher healthcare expenses. The disease impacts patients' ability to engage in both professional and social activities and is frequently associated with comorbidities, including cardiovascular problems.[3-7] Given its broad-ranging effects, axial spondyloarthritis represents a significant public health issue, highlighting the importance of effective management to enhance functional outcomes and overall well-being.

Current management of AS involves a combination of pharmacological and non-pharmacological treatments, with regular exercise recognized as a key component of care.[8-10] Exercise has been shown to reduce disease activity, pain, stiffness, and improve physical functioning in patients with AS.[11-13] Specifically, supervised group exercise (SGE) has been found to achieve greater improvements in quality of life, spinal mobility, and overall patient assessment compared to unsupervised individual exercise programs.[14-17] Non-pharmacological interventions, including exercise, are essential for enhancing physical and psychological well-being, and it

is crucial to integrate these strategies into the management of AS to optimize patient outcomes.

Despite the well-documented benefits of exercise in managing axial spondyloarthritis (AS), maintaining long-term adherence remains a significant challenge, particularly in unsupervised settings where motivation and consistency can decline over time. While previous studies indicate that supervised exercise may lead to superior clinical outcomes compared to home-based programs, direct comparative data remain limited, especially regarding patient satisfaction and engagement. Given the need for structured interventions to optimize disease management, this study aims to assess patient satisfaction and identify evidence-based improvements in supervised group exercise for AS. By addressing this gap in evidence, the study seeks to enhance the effectiveness of supervised exercise programs, ensuring that they are not only beneficial in improving disease activity and functional outcomes but also tailored to enhance adherence, motivation, and overall patient experience. The findings could provide valuable insights for healthcare providers in designing more structured and patient-centered exercise regimens that promote long-term participation and better health outcomes in AS care.

OBJECTIVE

- The aim of this study was to evaluate patient satisfaction and identify evidence-based improvements in supervised group exercise for axial spondyloarthritis.

METHODOLOGY & MATERIALS

This prospective, comparative study was conducted outdoors at the Rheumatology Department of Bangabandhu Sheikh Mujib Medical University (BSMMU) between January 2022 and June 2022. The study included 40 patients with axial spondyloarthritis, who were randomly assigned to either a supervised exercise group (n = 20) or a home-based exercise group (n = 20).

Inclusion Criteria:

- Diagnosis of axial spondyloarthritis according to the Assessment of SpondyloArthritis International Society (ASAS) criteria.
- Age between 18 and 65 years.
- Willingness to participate in the study and provide informed consent.

Exclusion Criteria:

- Severe comorbidities (e.g., cardiovascular disease, uncontrolled diabetes) that could interfere with exercise participation.
- Inability to perform physical exercise due to musculoskeletal or neurological limitations.
- Participation in another structured exercise program during the study period.

Participants in the supervised exercise group attended structured sessions led by a physiotherapist at the Department of Physical Medicine and Rehabilitation, BSMMU, three times per week for 12 weeks, each lasting 45–60 minutes, incorporating stretching, strengthening, aerobic exercises, and postural training. The home-based exercise group followed the same regimen independently with a printed guide and weekly phone check-ins for adherence monitoring. Outcome measures included disease activity (BASDAI), quality of life (ASQoL), and functional ability (BASFI), which were assessed at baseline and after 12 weeks. Additionally, patient exercise perception and satisfaction were evaluated using a questionnaire that assessed intensity, duration, load, and overall satisfaction with the exercise program, with satisfaction categorized using an SGE grade (≥7 being satisfied). Exercise adherence was also measured, with differences in adherence rates noted between groups. Statistical analysis involved independent t-tests and chi-square tests for between-group comparisons, paired t-tests for within-group changes, and ANCOVA for adjusted analyses. A p-value of <0.05 was considered significant. SPSS version 25 was used for all analyses. All participants provided written informed consent, ensuring confidentiality and voluntary participation.

RESULTS

Table 1: Baseline Demographics and Clinical Characteristics of Study Participants (n=40)

Characteristic	Supervised Exercise (n = 20)	Home-based Exercise (n = 20)	p-value
Age (years, mean ± SD)	51.5 ± 11.5	52.0 ± 12.0	0.89
Gender			
Male, n (%)	10 (50.0)	11 (55.0)	0.75
Female, n (%)	10 (50.0)	9 (45.0)	
Disease duration (years, mean ± SD)	23.0 ± 12.5	24.5 ± 14.0	0.72
Exercise adherence (%)	85%	55%	0.03

Table 1 presents the baseline characteristics of participants in the supervised exercise and home-based exercise groups. The mean age of participants was similar between the groups (51.5 ± 11.5 years vs. 52.0 ± 12.0 years, p = 0.89). Gender distribution was also comparable, with males comprising 50.0% of the supervised group and 55.0% of the home-based group (p = 0.75). The mean disease duration was slightly

longer in the home-based exercise group (24.5 ± 14.0 years) compared to the supervised exercise group (23.0 ± 12.5 years), but this difference was not statistically significant (p = 0.72). However, exercise adherence was significantly higher in the supervised exercise group (85%) compared to the home-based exercise group (55%) (p = 0.03), indicating better compliance with exercise regimens under supervision.

Table 2: Comparison of Disease Activity (BASDAI Score) Between Exercise Groups

Time Point	Supervised Exercise (n = 20)	Home-based Exercise (n = 20)	p-value
Baseline	5.5 ± 1.0	5.6 ± 1.1	0.765
After 12 weeks	4.0 ± 1.0	5.1 ± 1.1	0.002
Change (%)	-27.27%	-8.93%	<0.0001

Table 2 presents the changes in Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) scores over the 12-week study period for both the supervised and home-based exercise groups. At baseline, disease activity was comparable between the groups (5.5 ± 1.0 vs. 5.6 ± 1.1, p = 0.765). After 12 weeks, the supervised exercise group demonstrated a significantly greater reduction in BASDAI scores (4.0 ± 1.0 vs. 5.1 ± 1.1, p = 0.002). The percentage reduction in disease activity was also more pronounced in the supervised group (-27.27%) compared to the home-based group (-8.93%), with the difference being highly significant (p < 0.0001).

Table 3: Comparison of Quality of Life (ASQoL Score) Between Exercise Groups

Time Point	Supervised Exercise (n = 20)	Home-based Exercise (n = 20)	p-value
Baseline	4.1 ± 2.7	4.0 ± 2.8	0.909
After 12 weeks	2.1 ± 1.5	3.9 ± 2.5	0.009
Change (%)	-48.80%	-2.50%	< 0.0001

Table 3 presents the changes in quality of life, as measured by the ASQoL score, over the 12-week study period for both the supervised and home-based exercise groups. At baseline, the quality of life was similar between the two groups (4.1 ± 2.7 vs. 4.0 ± 2.8, p = 0.909). After 12 weeks, the supervised exercise group showed a significantly greater improvement in ASQoL scores (2.1 ± 1.5 vs. 3.9 ± 2.5, p = 0.009). The percentage change in quality of life was more substantial in the supervised group (-48.80%) compared to the home-based group (-2.50%), with the difference being highly significant (p < 0.0001).

Table 4: Comparison of Functional Outcomes (BASFI Score) Between Exercise Groups

Time Point	Supervised Exercise (n = 20)	Home-based Exercise (n = 20)	p-value
Baseline	4.2 ± 2.5	4.1 ± 2.6	0.902
After 12 weeks	2.0 ± 1.3	3.6 ± 2.4	0.013
Change (%)	-52.38%	-12.20%	< 0.0001

Table 4 presents the changes in Bath Ankylosing Spondylitis Functional Index (BASFI) scores over the 12-week study period for both the supervised and home-based exercise groups. At baseline, functional impairment was comparable between the groups (4.2 ± 2.5 vs. 4.1 ± 2.6, p = 0.902). After 12 weeks, the supervised exercise group demonstrated a significantly greater improvement in functional ability (2.0 ± 1.3 vs. 3.6 ± 2.4, p = 0.013). The percentage reduction in functional impairment was also more pronounced in the supervised group (-52.38%) compared to the home-based group (-12.20%), with the difference being highly significant (p < 0.0001).

Table 5: Comparison of Exercise Perception and Satisfaction Between Exercise Groups

Variable		Overall (N=40)	Supervised (N=20)	Home-Based (N=20)	P-value
Intensity Perception	**Too high**	2/40 (5%)	1/20 (5%)	1/20 (5%)	1.000
	Just right	8/40 (20%)	0/20 (0%)	8/20 (40%)	0.005
	Too low	30/40 (75%)	19/20 (95%)	11/20 (55%)	0.144
Overall duration (minutes)		115	130	100	
	Too long	2/40 (5%)	1/20 (5%)	1/20 (5%)	1.000
	Just right	28/40 (70%)	18/20 (90%)	10/20 (50%)	0.131
	Too short	10/40 (25%)	1/20 (5%)	9/20 (45%)	0.011
Overall Load	**Too heavy**	3/40 (7.5%)	1/20 (5%)	2/20 (10%)	0.563
	Too easy	33/40 (82.5%)	19/20 (95%)	14/20 (70%)	0.384
	Just right	4/40 (10%)	0/20 (0%)	4/20 (20%)	0.046
Overall Satisfaction (SGE Grade ≥7)	**Satisfied (≥7)**	32/40 (80%)	19/20 (95%)	13/20 (65%)	0.011
	Not Satisfied (<7)	8/40 (20%)	1/20 (5%)	7/20 (35%)	0.144

Table 5 presents the comparison of exercise perception and satisfaction between the supervised and home-based exercise groups for patients with axial spondyloarthritis. The table shows that intensity perception was significantly different, with more participants in the home-based group rating the intensity as "Just right" (40%) compared to the supervised group (0%) (p = 0.005). Regarding overall exercise duration, while the majority of participants in both groups found the duration "Just right," the home-based group had a significantly higher proportion reporting the duration as "Too short" (45%) compared to the supervised group (5%) (p = 0.011). In terms of load, more participants in the home-based group rated the load as "Just right" (20%), while none in the supervised group did so (p = 0.046). Finally, satisfaction with the exercise program was significantly higher in the supervised group, with 95% reporting satisfaction (SGE Grade ≥7) compared to 65% in the home-based group (p = 0.011).

DISCUSSION

This study evaluates patient satisfaction and identifies evidence-based improvements in supervised group exercise for axial spondyloarthritis (AS). Axial spondyloarthritis, a chronic inflammatory condition affecting the spine and sacroiliac joints, poses significant challenges in terms of both physical functioning and quality of life. The findings emphasize the importance of exercise as a non-pharmacological intervention in managing AS, with supervised group exercise demonstrating greater benefits in patient satisfaction, functional ability, and overall well-being. These results highlight the potential of structured exercise programs to enhance patient outcomes and provide valuable insights for clinicians aiming to optimize AS care.

The baseline characteristics in this study, including age, gender distribution, and disease duration, were similar between the supervised and home-based exercise groups, consistent with findings from Van *et al*.[18] This comparability ensures that differences in outcomes were likely due to the intervention rather than demographic variations. Exercise adherence was significantly higher in the supervised group (85%) compared to the home-based group (55%) (p = 0.03), aligning with the results of Rausch *et al*.[19], who found that supervised exercise programs led to better adherence rates. Their study also demonstrated that higher adherence in supervised programs contributed to significant improvements in disease activity, physical function, and quality of life. These findings further support the role of supervised exercise in optimizing adherence and enhancing clinical outcomes in patients with axial spondyloarthritis.

The BASDAI scores at baseline were comparable between the supervised (5.5 ± 1.0) and home-based (5.6 ± 1.1) exercise groups, indicating no significant differences in disease activity at the start of the study (p = 0.765). After 12 weeks, the supervised exercise group showed a significant reduction in disease activity with a 27.27% decrease in BASDAI score (4.0 ± 1.0), whereas the home-based exercise group had a more modest reduction of 8.93% (5.1 ± 1.1). The supervised exercise group had a statistically significant improvement compared to the home-based group (p = 0.002). Furthermore, the percentage reduction in disease activity was highly significant in the supervised exercise group compared to the home-based group (p < 0.0001). These results are consistent with the findings of Liang *et al*.[20], who also reported greater improvements in disease activity in the supervised exercise group compared to home-based exercise in patients with ankylosing spondylitis. Their study found that supervised programs were more effective in reducing BASDAI scores, supporting the idea that supervision may enhance the efficacy of exercise programs in managing disease activity in axial spondyloarthritis patients.

The ASQoL scores at baseline were similar between the supervised exercise (4.1 ± 2.7) and home-based exercise (4.0 ± 2.8) groups, indicating no significant differences in quality of life at the start of the study (p = 0.909). After 12 weeks, the supervised exercise group showed a significant improvement in quality of life, with a 48.8% reduction in ASQoL score (2.1 ± 1.5), whereas the home-based exercise group demonstrated only a slight reduction of 2.5% (3.9 ± 2.5). This difference was statistically significant (p = 0.009) and highlighted the superiority of supervised exercise. Moreover, the percentage change in ASQoL score was highly significant between the two groups (p < 0.0001), reinforcing the substantial benefit of supervised exercise over home-based programs. These findings align with those of López-Medina *et al*.[21], who also observed a significant improvement in quality of life in patients undergoing more structured exercise interventions, particularly in relation to disease activity and functionality. Their study highlighted the importance of supervised interventions in improving quality of life, which supports the results found in the present study.

The BASFI scores at baseline were comparable between the supervised (4.2 ± 2.5) and home-based (4.1 ± 2.6) exercise groups, indicating no significant difference in functional impairment at the start (p = 0.902). After 12 weeks, the supervised exercise group showed a significant improvement in functional ability, with a 52.38% reduction in BASFI score (2.0 ± 1.3), whereas the home-based group demonstrated only a 12.20% decrease (3.6 ± 2.4). The between-group difference was statistically significant (p = 0.013), highlighting the greater effectiveness of supervised exercise. These results are consistent with the findings of Bilberg *et al*., who also reported superior functional improvements in their supervised exercise

group compared to controls. Their study found that structured, supervised exercise programs were more effective in enhancing physical function, which aligns with our findings. However, in contrast to Bilberg *et al*.[1], where the control group showed minimal change in functional status, our home-based group exhibited a moderate reduction, though significantly less than the supervised group. This suggests that while home-based programs provide some benefit, supervised exercise remains more effective in optimizing functional recovery in axial spondyloarthritis patients.

The overall perception of duration and workload differed significantly between the supervised and home-based groups. While both groups reported similar perceptions of "too long" duration, the supervised group showed higher satisfaction with the allocated time, with fewer participants rating it as "too short" compared to the home-based group (5% vs. 45%, $p = 0.011$). Additionally, the home-based group had a greater percentage of participants reporting a "just right" workload (20% vs. 0%, $p = 0.046$), suggesting that participants in the home-based group may have felt the exercise load was more manageable. These findings align with those of Hilberdink *et al*.[22], who also observed greater satisfaction with supervised programs, which is likely due to the structured guidance and more consistent monitoring. This supports the notion that while home-based exercise provides some flexibility, supervised group exercise better supports optimal engagement, satisfaction, and overall effectiveness, particularly for managing the duration and perceived intensity of exercise in patients with axial spondyloarthritis.

Limitations of the study

This study had some limitations:

- The sample was not randomly selected.
- The study's limited geographic scope may introduce sample bias, potentially affecting the broader applicability of the findings.
- The absence of long-term outcome data, which may affect the ability to fully assess the durability and performance of provisional crowns.

CONCLUSION

This study highlights the significant benefits of supervised group exercise on patient satisfaction, functional outcomes, and overall well-being in axial spondyloarthritis. The supervised group showed greater improvements in key measures, demonstrating the importance of structured supervision in boosting adherence and efficacy. Notably, patient satisfaction, functional ability, and quality of life were more significantly improved in the supervised group. These findings underscore that supervision enhances both clinical outcomes and the patient experience. Future studies with larger sample sizes and longer follow-ups are needed to confirm these results and further refine exercise interventions for axial spondyloarthritis management.

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