

REVIEWER'S REPORT

Manuscript No.: IJAR- 58343

Title: Determining an effective method for preventing shoulder pain induced by wheelchair basketball,

Recommendation:

Accept after minor revision

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality			✓	
Clarity			✓	
Significance	✓			

Reviewer's ID: Bilqees Hamza

Detailed Reviewer's Report

The manuscript entitled "Determining an effective method for preventing shoulder pain induced by wheelchair basketball" explores an important and highly prevalent clinical challenge within adaptive sports. Since wheelchair basketball requires the upper limbs to serve both propulsive and gestural functions, the shoulder joint complex is subjected to repetitive mechanical stress and chronic overuse, leading to a high frequency of musculoskeletal injuries and tendinous lesions in the rotator cuff and long biceps tendon. This study addresses a vital geographical and clinical gap by evaluating the preventative efficacy of three distinct conservative management protocols over an eight-week intervention period among competitive male athletes in Burkina Faso. The research framework is well-considered, drawing from established physiological models of physical therapy to mitigate pain while monitoring concurrent changes in athletic performance markers such as speed, explosive upper limb strength, and aerobic endurance.

The primary contribution of this research lies in its comparative evaluation of multi-modal physical therapy interventions against standard exercise regimens within an athletic cohort that faces systemic resource constraints. By utilizing a sample of thirty-five male players from prominent sports associations such as the Burkina Faso Association for Adapted Sports and Handicap Solidaire, the authors provide essential real-world clinical data regarding the management of shoulders that bear weight during sports. The methodological inclusion of transcutaneous electrical nerve stimulation and local cryotherapy

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alongside a foundational muscle strengthening program addresses a compelling clinical question regarding whether passive therapeutic modalities offer an additive prophylactic benefit.

A major positive aspect of the manuscript is its clear documentation of the varying degrees of pain relief achieved across the groups, noting that while muscle strengthening alone yielded a significant reduction in pain intensity, the integration of electrostimulation and cryotherapy achieved markedly higher percentage improvements of thirty-eight point two percent and forty-five point seven percent respectively. Furthermore, the statistical isolation of inter-group differences using non-parametric tests like the Wilcoxon signed-rank and Kruskal-Wallis tests provides a clear analytical baseline that validates the clinical necessity of combined multi-modal therapies. The paper presents a valuable foundation for sports medicine professionals looking to optimize training schedules and long-term joint preservation strategies for wheelchair athletes.

Improvements

To elevate the manuscript to a standard suitable for international publication, several structural, nomenclature, and methodological clarifications must be addressed within the text. First, there is an immediate and confusing inconsistency in the labeling of the experimental groups between the methodology section and the results tables. In the description of the experimental protocol, the groups are designated as the Control Group, Experimental Group 1 for the electrostimulation cohort, and Experimental Group 2 for the cryotherapy cohort. However, within the abstract and the statistical results text, these same groups are referred to as GE2 and GE3, or Experimental Group 2 and Experimental Group 3. The authors must standardize this terminology throughout the entire document to ensure that the reader can track the interventions seamlessly without deciphering contradictory group labels.

Second, the description of the statistical parameters requires more thorough elaboration to ensure transparency and reproducibility. The authors note that the Kruskal-Wallis test showed a significant difference in the decrease of shoulder pain intensity among the three groups with a p-value of zero point zero thirteen, which is subsequently followed by pairwise comparisons. However, the text does not explicitly clarify whether a post-hoc correction, such as the Bonferroni or Dunn-Bonferroni adjustment, was applied during these pairwise comparisons to control for inflation of the Type I error rate. Given that the study features multiple independent comparisons between the control program and the two physical therapy variants, updating the statistical analysis section to detail the exact post-hoc procedures utilized is essential for methodological rigor.

Third, the interpretation of the physical capacity metrics needs a more critical and nuanced discussion. The results demonstrate that while movement speed significantly improved in the control and electrostimulation groups, variables such as the Yoyo test distance and maximum pass distance did not

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yield statistically significant changes. The authors should expand their discussion to contextualize why an eight-week strengthening program failed to elicit substantial adaptations in explosive strength and aerobic capacity, perhaps by exploring potential confounding variables such as the mechanical limitations of locally designed wheelchairs, the baseline physical conditioning of the players, or the specific volume and intensity of the dumbbell and elastic band exercises. Additionally, the text should clarify the apparent drop in the mean Yoyo test performance for the electrostimulation group to confirm whether this reflects a true physiological trend or an artifact of sample variance.

Finally, the clinical description of the study population could be enriched by providing more detail on the structural state of the participants' shoulders at baseline. The introduction mentions that previous ultrasound investigations identified tendinous lesions in seventy-two percent of this athletic population, yet the inclusion criteria do not specify whether the selected thirty-five players were stratified based on the presence of chronic structural pathology or asymptomatic overuse. Integrating a brief paragraph explaining how baseline clinical variations or individual levels of functional impairment might have influenced the therapeutic response to TENS and cryotherapy would greatly enhance the clinical depth of the discussion.

Recommendations

The manuscript addresses a highly relevant topic in adaptive sports medicine and provides clear evidence supporting the integration of multi-modal physical therapy protocols into athletic training regimens. The data convincingly demonstrates that while localized muscle strengthening forms a necessary foundation for long-term joint stabilization, the supplementary analgesic mechanisms of transcutaneous electrical nerve stimulation and cryotherapy significantly accelerate short-term pain relief and participant comfort. These insights are particularly valuable for designing sustainable, low-cost injury prevention models in regions where advanced rehabilitative infrastructure may be limited.

In light of the study's findings and structural layout, I recommend the article for publication with **Minor Revision**. The final acceptance of the manuscript should be contingent upon the authors correcting the mismatched experimental group labels across the text and tables, clarifying the specific post-hoc statistical adjustments used for the pairwise comparisons, and expanding the discussion section to address the lack of significant improvements in aerobic endurance and explosive upper-limb power. Resolving these minor presentation and analytical details will clarify the presentation and confirm the study's value to the broader field of adapted physical activity and sports physical therapy.